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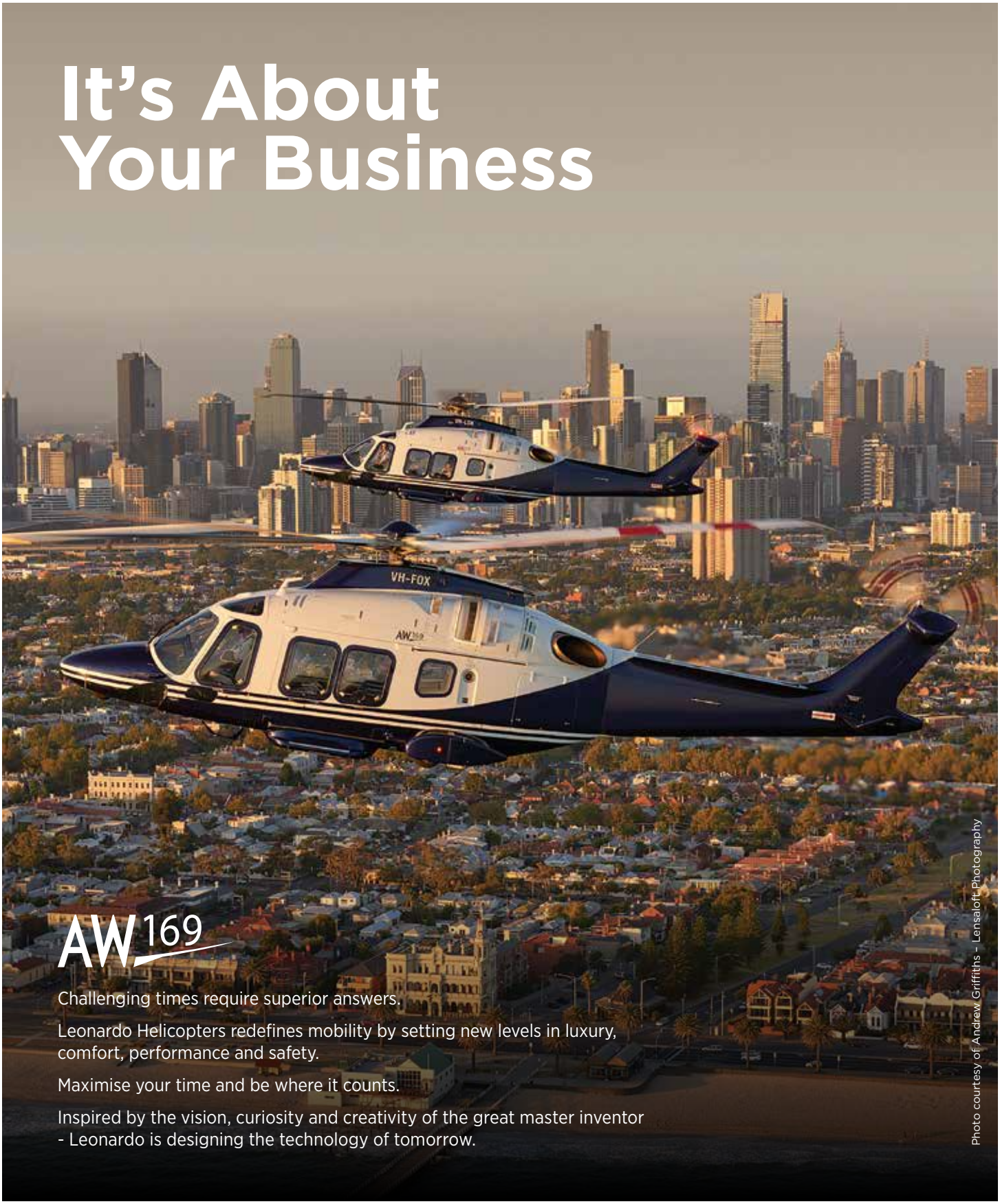

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Cover

A Bell 206L LongRanger, operated by Sky Helicopters, flies over some picturesque backcountry near Vancouver, British Columbia. The aircraft sports a special livery featuring a stylized maple leaf to celebrate Canada's 150th anniversary in 2017.

HEATH MOFFATT PHOTO

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COLUMN

FOCUS ON SAFETY | **GEOFF GOODYEAR**

FULL DISCLOSURE!

In our increasingly litigious society, spilling the beans can have some nasty consequences. Any encounter with the law warns you that anything you say can be used against you. Lawyers will tell you to say nothing incriminating and, indeed, we come by such practices instinctively.

I recall an event during my career where I was less than candid when queried by a client. It was some years ago, after a nasty flood in central Newfoundland. The Exploits River broke all recorded water levels that spring and caused a lot of damage along its length. While our communities are much smaller than those in Houston, many experienced severe damage. (Having gone through a flood experience, I am sure many here in central Newfoundland extend their heartfelt wishes to those in Houston.)

Not all the damage was community-based. The local pulp mill had tens of thousands of cords or pulpwood stored in the river behind retention booms. These booms broke as the flood waters crested, and all that wood swept downstream to the mouth of the river. Now, it just so happened that yours truly lived at the mouth of this river, and like many of my neighbors, we burned wood to heat our homes. While reeling from all the local devastation, it was a rather interesting contrast to have all this wood literally show up on your doorstep!

All hands moved into action, claiming the wood that had washed up. It was like an amphibious assault, only in reverse. Instead of repelling invaders we welcomed them with open arms and pickeroons — axe-like devices with with steel picks at the end instead of axe heads. They are used for grabbing pulp wood, and in a paper town, everybody had one!

At first, we grabbed every piece of wood we could find. That quickly proved too onerous, so we limited our take to eight-foot logs that would be easier to handle. Like a large bird of prey, trying to pick lunch from a huge flock of small birds, that soon proved confusing. All sorts of selection filters were applied until we would only take eight-foot wood more than six inches in diameter that had lost all its bark! We had gotten very picky, and could afford to as we still got all the wood we could handle.

The wood fiber slaughter went on for several days. It was manna from heaven. At the end of the exercise, my hard work had paid off, and I had about 10 cords of wood neatly stacked above the high water line on the beach, ready for junking and splitting.

Several days later, our base in Gander got a call from the local paper mill. It wanted to survey the damage along the river. Yours truly got the nod, and flew the aircraft to Grand Falls to pick up the woods manager from the paper company. We started our survey well west of Grand Falls, and as we flew over the area where the retention booms and all their pulp wood stock had been, he lamented the loss of their inventory and wondered out loud how they would be able to recover it.

All hands moved into action, claiming the wood that had washed up. It was like an amphibious assault, only in reverse. Instead of repelling invaders we welcomed them with open arms and pickeroons.

I began to squirm in my seat. As the aircraft continued on down the river, so did his lamentations. The farther down the river we moved, the more animated his discontent. I had anticipated that by the time we came to the beach by my house, this whole affair was going to reach a fever pitch and awkward questions would ensue.

I tried to steer clear of my part of the Exploits, but even from five kilometers away, there was no mistaking the huge neatly stacked pile of wood. The Egyptian pyramids would cast less of a shadow than this pile of pulp wood. His eyes opened wide as he saw the stack and he started in. “That wood belongs to the mill!” he exclaimed. As we got closer, you could make out the figure of a person standing alongside the pile. It was my wife, Alison, standing proudly alongside the wood that would heat our house for a couple of years. We may have gotten clear of the scene unscathed, except she started to wave at the helicopter having rightly assumed her husband was the pilot. It was like waving a red sheet in front of a bull. The woods manager blurted out, “Who is that?! That is theft of our wood!”

What I should have said was, “That is my wife. We stacked that wood so it would be easier for you to collect.” What I actually said was, “Haven’t the slightest idea who that is, chief!” and quickly changed the topic while turning the aircraft off in another direction.

While full disclosure did not win this day, in our operational environment, reticence to speak out, even at the risk of embarrassment, runs counter to effective safety management efforts. Thankfully many organizations have adopted non-punitive or just culture policies to help free up the flow of safety information.

I was not aware of these policies at the time and my house was kept warm and cozy for several years.

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FOCUS ON TRAINING | **ANDY ROE**

SINGLE ENGINE AUTOROTATION

Even though much has already been written about autorotation, I thought it might be worthwhile revisiting a few points in this column. The word autorotation sounded strange to me when I first heard it. It sounded as though, if your engine failed, maybe the helicopter would somehow rotate to the ground automatically. Now I think of autorotation as pilot-controlled engine-off rapid descent in flat pitch. It is far from automatic, and a successful outcome definitely relies on pilot control.

Piston and turbine engines are very reliable these days, but the full touchdown autorotations you learned how to do in training were important nonetheless. Many flight schools have a policy of not teaching full-down autorotation landings, citing safety reasons. Although I can understand the safety concern, I'm not sure how their graduate pilots would fare if they did find themselves without an engine at some point. Maybe that's just the way training is these days.

An essential part of your flight planning before heading out on that week-long charter job is to make sure the rotor rpm in flat pitch is set properly. Also referred to as auto revs, they are adjustable at the pitch change links and set by the maintenance engineers. Yes, the collective must be fully lowered if engine power is lost, but if the auto revs are not set correctly, you may have difficulty with the landing. For example, if the auto revs are very low, you may not be able to maintain enough rotor rpm on the way down to complete a successful touchdown.

The auto revs at a steady attitude should be just above the middle of the green arc for power off descent, and this setting will change with different gross weight configurations. The pilots of early helicopters kept adjusting the pitch change links until touchdown landings were easiest to control. Later models have more accurate auto rev calculations to work from in the maintenance manual.

Many helicopter companies have their pilots determine and record the auto revs in the journey log book on a regular basis. This calculation gives you peace of mind before taking over a machine that you haven't flown before. The best way to determine where the auto revs are without any documented calculation is to jump in the machine, climb to altitude, enter autorotation, hold the attitude steady — and find out.

How far will you be able to glide in autorotation? The answer is based on ground speed and rate of descent. Most light helicopters autorotate at close to 1,500 feet per minute. If you are descending at 60 knots, you will lose 1,500 feet of height for each nautical mile travelled. By increasing the speed and the pitch angle of the main rotor blades within limitations, you can extend the range further. By reducing speed and/or turning, and using collective pitch to manage rotor rpm, the range will be much less as you descend.

Student pilots have a tendency to follow the helicopter down to the ground in autorotation. Learning to vary the range across the ground in autorotation to accurately arrive at a predetermined location takes a lot of practice to perfect. And when you arrive at your predetermined spot, you must also have enough airspeed and rotor rpm to carry out a successful landing. One student pilot told me that he and his instructor had practiced 285 autorotations throughout his training, including 220 full touchdown landings. It was music to my ears.

If you have a body of water to cross, you need enough height to be within safe gliding distance to the shore on either side in the event of a power loss. If you decide to cross a stretch of water eight nautical miles wide, you know once again that you will lose about 1,500 feet for every nautical mile travelled without the engine. Half way across is four nautical miles, so you will need to be at 6,000 feet (four x 1,500) to reach either shore in autorotation.

Although not technically an autorotation, a power-on descent with the main rotors in flat pitch is very similar. Quite often, I find that student pilots wanting to descend quickly to get below weather or simply because they have a lot of height to lose will continually reduce collective pitch to increase the rate of descent, instead of working with airspeed as well as reduced pitch. If the student maintains a cruise speed to descend, the collective pitch usually ends up in the fully-down position. In this autorotation-like configuration, the rate of descent will be around 1,500 feet per minute, but with no blade loading the rpm might be hard to control and passengers will get an awkward sensation of freefalling.

Mountain pilots who routinely climb and descend many thousands of feet will tell you that if you lower the collective about halfway down, and then increase speed past the restricted Vne speed limitation with the blades in flat pitch (but not below the standard Vne limitation corrected for height), the helicopter will descend much faster and in better control.

A helicopter pilot well practiced in all aspects of autorotation and emergency procedures is ready to take on helicopter flying as a creative challenge. A pilot without adequate autorotation and emergency training can look forward to a helicopter flying career with associated risks if things go wrong. Get the best training you can. It's worth it.

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FOCUS ON MAINTENANCE | **JOHN CARINHA**

THE IMPORTANCE OF CARING

Father time pauses for nothing. Age is a process that finds us at conception and remains with us until we are no longer a part of this Earth. As of this writing, my father has turned 81 and his overall physical health is declining. He and my mom recently downsized into a condo, and as I realize my time with them is more limited than ever, I find myself reflecting a lot on my relationship with them. I think of the values and morals they have taught me by example, and realize that it all ties to where I've been, where I am, and where I am going.

In their prime, my parents had a strong work ethic and an attitude that never gave up for — or on — anything. Age eventually changed some of that, but at their core, they are as solid as they come. Their collective knowledge base and forward thinking ability played well with their frugal approach to a lot of things in life. In other words, they knew how to make money, but even more so how to save it.

Coming from such a hardworking background, it's no wonder that today's generational attitude frustrates my parents to no end. I myself find the sense of entitlement and lack of focus and accountability to be a huge challenge of patience.

After much trial and tribulation through simply living life, I found myself drumming up an acronym that best describes a measurable attribute in individuals, simply termed G.A.S. — which stands for a level of "give a sh*t" or simply, the G factor. We all have it in varying forms, but more than ever, it's evident society seems to be accepting of lesser and lesser levels of it. Whether it's countries strong arming one another for political dominance, your local grocer texting on their phone while you wait for their attention, or those who wait for the train to pass with their engines running, the fact remains many people care more about their own interests than the interests of others.

Curious to prove my own theory wrong, I set out to test the waters in my own daily routine. I challenge you to do the same. Walk into any big box store, ask the first employee you see for the location of two or three random items, and I assure you they won't be the last person you talk to before you have what you're looking for. You simply get handed off until someone knows or cares enough to answer your needs.

Tying this back to our industry, I think long and hard about what has made small MRO shops successful and able to survive recessions and slow spells. It all revolves around the aforementioned G factor. As a small business, what makes us unique is the boutique delivery of the general services any MRO shop would be capable of providing. The difference? The smaller guys can't afford to not care. One cannot rely on assumptions that the hangar will always be full and the phone always ringing. By nature, half our business plans are written on the basis that we just apply a lot more direct care and effort towards what is ultimately customer service. Now, that's not to take away from the service that larger shops offer. I'm by no means suggesting they are all the same. It is, however, fair to say that the overall client experience has the potential to be diluted when compared to a more intimate and personal experience offered by a smaller business. It's arguable that we are more exposed with fewer places to hide when things become strained or challenging. We are enabled to shape ourselves into employing higher G factors because the alternative is ultimately a matter of when, not if, we begin to fail.

When I first opened my shop 14 years ago, I was hungry for work. I called on a client who had worked with me while I was employed under a major MRO shop and decided to pay them a visit to solicit my services. I'll never forget the comments he made. In essence, he spoke a lot of truths that I wasn't prepared to let in: I was once an unproven technician from a reputable company; now, I was a reputable technician from an unproven company. It's hard to recover from that reality, but I look back now and I have much gratitude and appreciation towards my heritage, upbringing and the values instilled during my formative years of life. Those were truly the base tools that gave me the ability to persevere through entrepreneurship and form a business in the process; one that I am proud of and that is an asset to our industry and community.

Thanks, Mom and Dad.

Coming from such a hardworking background, it's no wonder that today's generational attitude frustrates my parents to no end. I myself find the sense of entitlement and lack of focus and accountability to be a huge challenge of patience.

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FOCUS ON LEADERSHIP | **KIM HUTCHINGS**

EMOTIONAL INTELLIGENCE

Have you ever been hired by a company or promoted to a new position and feel you received less than adequate training? Did the person doing the training spend time with you and explain in detail so that you understood? Or was the training rushed, rude and full of disregard?

Recently, I spoke with a pilot who was doing training with a senior pilot. He told me he found it difficult to stay positive and focused when the senior pilot made sarcastic jokes about his performance. The senior pilot used a direct way of giving instructions, and he rushed through the lessons, causing the pilot to get flustered and lose focus. Instead of showing any concern, the senior pilot would get frustrated and lose his patience. The pilot also got frustrated, which caused him to make more errors. It was a vicious cycle.

The pilot taking the training was more quiet and introverted. He was a perfectionist, operated by the book, and did not like to get things wrong. The senior pilot was outgoing, hard-working, and would slightly "bend" the rules if it meant getting things done. He had expectations of the way things should operate, and he had no problem letting others know how he felt. Both of them are great pilots, but with two very different personalities. And now they are clashing in the cockpit. As you can imagine, the training is not going well.

This is not the first time I have heard this scenario, nor will it be the last. It usually happens when someone is promoted to a training position for one or more of the following reasons: they are good at their current job, have been there the longest, are the next person in line for a promotion, meet the right requirements, or there is no one else to do it. Unfortunately, sometimes people are promoted into a position of leadership without being given leadership training. As a person in charge of training others, you need to have leadership skills. You transition from utilizing technical skills as the primary purpose of your job, to people skills.

Why is it that pilots and mechanics are trained and required to be checked out on a new aircraft, yet when they are promoted to a leadership position, they are not provided any training on how to be a great leader? How comfortable would you feel jumping into an aircraft flown by a pilot, or maintained by a mechanic, who was unfamiliar with the make and model? Yet every day, people manage and/or train others without any training in how to do so.

A successful trainer needs to have certain skills. They should already have the technical skills, but they often lack the personal skills. According to the psychologist and author Daniel Goleman, emotional intelligence is a group of five skills that allows leaders to maximize their own and their followers' performance. These skills are: self-awareness, self-regulation, motivation, empathy, and social skill.

Firstly, self-awareness is knowing one's strengths, weaknesses, drives, values, and impact on others. The senior pilot in my example lacked self-awareness. He was not aware the impact his method of training was having on the pilot. He thought he was "joking" when he was pointing out the things the pilot was doing incorrectly, but instead the pilot was taking the jokes as insults. His weakness was not being able to accurately assess the level of his frustration as well as the pilot's, and how that impacted the training session.

Next is self-regulation, which is the ability to control or redirect disruptive impulses and moods. The senior pilot allowed his frustration to show. He made sarcastic jokes and allowed his mood to shift when things weren't going smoothly. This had a direct negative impact on the pilot, who was there to focus on his training.

The third skill is motivation, or relishing achievement for its own sake.

Relishing achievement does not mean boasting. It means taking pride in a job well done and looking for creative solutions. The senior pilot was most likely not motivated to be the best trainer; otherwise he would have found other methods to encourage the pilot. Chances are the senior pilot was "motivated" by external reasons such as a promotion once the new pilot's training was complete.

Then there's empathy, in the form of understanding other people's makeup.

Anyone who is in a position to lead, train, manage or direct, will not be successful in that role unless they have empathy. Empathy does not mean feeling sorry for someone. It means being able to put yourself in another person's shoes so that you can make better decisions for a better outcome. Had the senior pilot reminded himself of what it feels like to be training and learning something new, he could have focused on more positive feedback instead of using sarcasm.

Lastly, emotional intelligence requires social skills. Not the type of social skills of telling stories in a bar over a couple of beers. It means finding common ground and building a rapport with someone because you may need this person in the future. The senior pilot failed to build a rapport with the pilot. Instead he created a relationship that was strained from the start. Not only did this interfere with providing good training, but it also created turmoil in the cockpit. Most likely in the future, when these pilots fly together on regular missions, the animosity will still be there.

Technical skill and job performance are important pieces when it comes to being a successful trainer, but without emotional intelligence, the puzzle is not complete. The good news is that emotional intelligence can be learned. As Goleman says: "It takes time and, most of all, commitment. But the benefits that come from having a well-developed emotional intelligence, both for the individual and for the organization, make it worth the effort."

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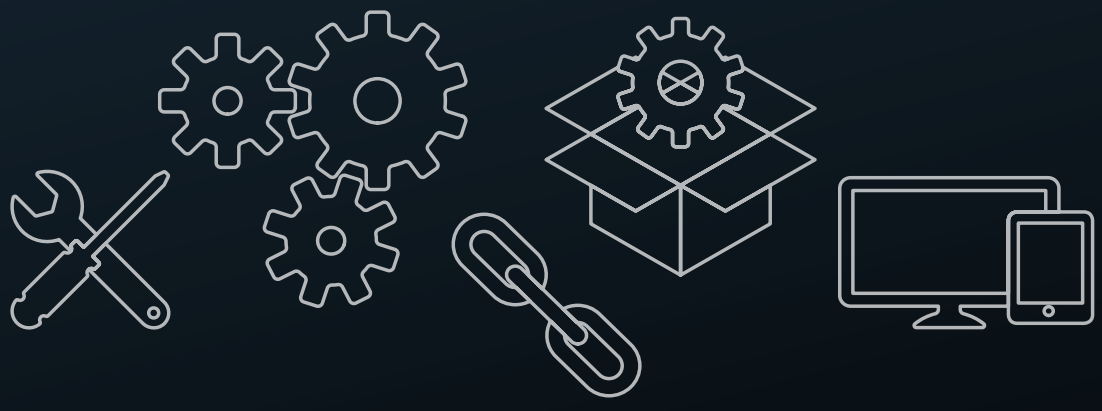

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A pilot with Airlift AS is getting ready for a flight into the sunset from Flesland Airport in Bergen, Norway. Airlift AS is under contract with the Norwegian Coastal administration to provide three AW169s for boat pilotage services.
Tom A. Østrem Photo


AIRLIFT

Simon Pryor sent us this nice snap of Essex & Herts Air Ambulance's new Leonardo AW169. Simon photographed the new helicopter near their operating base at North Weald airfield in England.

A United States Navy Sikorsky MH-60S Knighthawk from Norfolk, Virginia-based HSC-22 Sea Knights "Chargers" hover-taxis into land at Airshow London in London, Ontario. **Michael Durning Photo**

An Ornge Leonardo AW139 air medical helicopter departs the London International Airport in London, Ontario, to respond to a scene call. **Dave Mills Photo**

The AW189K has been flight testing at Leonardo's Cascina Costa center since March, clocking up 25 hours across 35 flights. **Leonardo Photo**

Safran unveils Aneto engine

New 2,500- to 3,000-shp turboshaft to power Leonardo AW189K

BY THIERRY DUBOIS

Safran Helicopter Engines has found a launch customer for its long-discussed engine family in the 2,500- to 3,000-shaft horsepower (shp) range — the Aneto — and it is an evolution of a helicopter so far powered by General Electric (GE) — the Leonardo AW189.

The Aneto-1K will equip the AW189K super medium twin, giving it 28 percent more power at takeoff — at 2,544 shp per engine — than the CT7-2E1. Emergency power with one engine inoperative in the AW189K will be 2,977 shp.

The Aneto family uses both Safran's experience with the RTM 322 in the military field and several technology bricks from its Tech 3000 demonstrator. Certification of the engine is planned for the third quarter of 2018, according to Florent Chauvancy, Safran's VP for heavy helicopter engine programs.

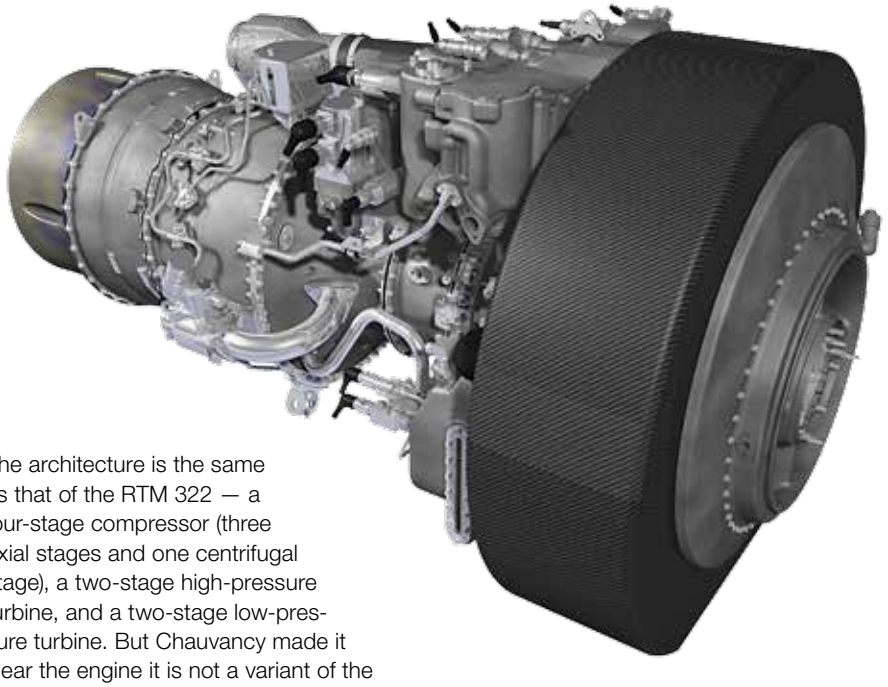
The engine has been flying on the AW189K since March at Leonardo's flight-test center in Cascina Costa, near Milan, Italy. As of Sept. 19, the AW189K had flown 25 hours across 35 flights, according to Claudio Nittoli, AW189 program manager.

According to Leonardo, the Aneto-1K allows the AW189 to "respond to market demand, particularly in hot-and-high conditions." The airframe original equipment manufacturer said the AW189K would better leverage the versatility of the super-medium platform, "which is not just a long range offshore or SAR [search-and-rescue] helicopter."

The aircraft's entry into service is scheduled for late 2018.

For its new product, Safran claims a 25 percent increase in power-to-weight ratio, compared to existing engines of the same size. The Aneto family will include "potentially three" members for helicopters in the eight-to-15 metric ton class. The Airbus Helicopters X6, which will succeed the Super Puma family, is widely expected to be the next application.

The Aneto-1K, which will power the Leonardo AW189K, is the first member in Safran's new 2,500- to 3,000-shp family of turboshafts. **Safran Image**



The architecture is the same as that of the RTM 322 — a four-stage compressor (three axial stages and one centrifugal stage), a two-stage high-pressure turbine, and a two-stage low-pressure turbine. But Chauvancy made it clear the engine it is not a variant of the RTM 322; the Aneto – named after the highest peak in the Pyrenees – will have its own type certificate and no part in common with the RTM 322.

One distinctive feature of the new engine is the number of parts that use additive manufacturing. They can be found in the compressor's stators for instance, some of these parts being "critical," the company said. The dual-channel FADEC is new, and the high-pressure turbine employs unspecified new materials.

Meanwhile, work continues on Safran's Tech 3000 demonstration program. "Some technology bricks have to be validated," Chauvancy explained. The most powerful versions in the Aneto family will be certified after 2020, and the upper power limit will be somewhere between 3,000- and 3,500-shp, according to Chauvancy.

Leonardo Photo

But the Aneto is not all about power. "We twisted the arms of our engineers — having the best engine is not enough, maintenance should be considered from the beginning of the design phase," Chauvancy said. As a result, maintenance technicians may expect three times less maintenance tasks, compared to the existing GE engine on the AW189.

As for fuel burn reduction, the Aneto promises "up to 15 percent better fuel consumption over existing engines in the same category," once all Tech 3000 technologies are integrated.

Moreover, it is compatible with a hybridized architecture, Chauvancy said. The idea in such a system is that one engine can be shut down during cruise flight (or let run at idle power) for a better overall efficiency and, if needed, restarted very quickly. Full power could be regained in 10 seconds, the company claimed. Fuel consumption could thus be cut by another 15 percent or more, Chauvancy suggested. Safran ran a hybridized RTM 322 on a test bed last year.

The combustors of the Aneto's next versions will use a concept inaugurated with the smaller Arrano — a stabilized flame in a swirling flow of mixed air and fuel in the combustor. As fewer fuel nozzles are needed, weight and cost are reduced, while efficiency and operability are improved.

ROTOR BITS

Swiss Rotor Solutions Photo

FAA CERTIFIES ASTAR MAX PILOT VIEW KIT

Swiss Rotor Solutions' Maximum Pilot View Kit (MPVK) has received a supplemental type certificate (STC) from the Federal Aviation Administration.

The MPVK provides the pilot with an uninhibited field of view below and to the right hand side of the aircraft.

Designed specifically for the H125/AS350 helicopter, the kit comprises two main pieces, with a new bubble door accompanied by a lower vertical window assembly and associated floor and fuselage insert/frame.

The STC was obtained with the support of Swiss Rotor Solutions' European Aviation Safety Agency 21J certification partner, GVH Aerospace, who will also support serial installations and continued airworthiness.

Transport Canada/Agência Nacional de Aviação Civil STC validation is in progress and expected shortly.

DART Photo

DART H145 EMERGENCY FLOAT SYSTEM FAA & EASA APPROVED

DART Aerospace has received Federal Aviation Administration and European Aviation Safety Agency approvals for its redesigned H145 emergency float system. Now certified for Sea State 6, the float system boasts longer maintenance intervals, weight savings, and is compatible with original equipment manufacturer fixed provisions.

People dangling at the end of a helicopter's long line have become a common sight in the U.S. power utility industry. A new FAA advisory circular adds guidance for such operations. **Heath Moffatt Photo**

FAA issues new human external cargo guidance

BY ELAN HEAD

For the first time in nearly 40 years, the U.S. Federal Aviation Administration (FAA) has updated its advisory circular (AC) for rotorcraft external load operations, adding new guidance for human external cargo (HEC) ops.

The FAA published AC 133-1B in May of this year. It replaces AC 133-1A, which was issued in October 1979. Greatly expanded from its predecessor, the new AC offers more detailed guidance on all aspects of operations under 14 Code of Federal Regulations part 133, including the certification process, operating rules, and airworthiness requirements.

Notable in the AC is specific guidance for HEC operations conducted as Class B (jettisonable) loads. Four decades ago, it was rare to see a human being dangling at the end of a helicopter's long line. Today, it's a common sight in the U.S. power utility industry, and the technique is also widely used for rescue operations by government agencies.

"It's being used so much more than anybody ever anticipated," remarked Jeff Yarnold, vice president of operations for the British Columbia-based company Boost Human External Cargo Systems. Originally, he said, HEC was thought of only as an emergency tool; now, power utility technicians "are going to work [on the end of a line] all day long."

Class B HEC is restricted by law to only those personnel performing an essential function in connection with the external load operation, or who are necessary to accomplish the work activity directly associated with that operation. Within those constraints, however, "Class B HEC has become an essential tool within the rotorcraft-helicopter industry and when conducted utilizing best safety practices has proven to be a safe and efficient means of transport," AC 133-1B states.

The AC outlines some of those "best safety practices," drawing heavily on material contained in the safety guide developed by Helicopter Association International's Utilities, Patrol, and Construction Committee (UPAC).

For example, the AC suggests minimum pilot qualifications including 2,000 pilot-in-command (PIC) hours in helicopters, 500 hours of vertical reference long line experience, and 200 PIC hours in type — all numbers that appear in the UPAC guide. The AC also outlines suggestions for crewmember qualifications, pilot and crewmember training, daily briefings, and in-flight communication.

Additionally, the AC explicitly addresses the use of portable safety devices (PSDs or "belly bands") in HEC operations. These devices, similar to a belt or a strap, go through the cabin, wrap around the fuselage, and hang below the aircraft between the landing gear. Connected to the helicopter's long line, they retain the long line should the cargo hook release inadvertently.

The AC confirms that belly bands are authorized for HEC operations and do not require a supplemental type certificate (STC), since they are not permanently installed in the aircraft. However, the AC also states that if operators choose to use a PSD, they "must ensure that it does not endanger the safe operation of the aircraft. This would include an evaluation to show that the load is transportable and releasable, when necessary, without hazard to the helicopter during both normal and emergency flight conditions."

The AC also specifies additional cargo hook equipment upgrades to be used in conjunction with PSDs. These include substantiating a higher static limit load for the external load attaching means and corresponding personnel carrying device system (PCDS); using a PCDS with improved structural integrity; and conducting a fatigue evaluation of the PCDS and aircraft quick-release system attaching means.

Other upgrades include incorporating separate dual actuation devices in both the primary and backup quick-release systems in the aircraft, and substantiating more stringent electromagnetic interference and lightning protection for the quick-release system in the aircraft.

Air Rescue Systems (ARS) vice president Bob Cockell, whose company manufactures a PSD called the Heli-Bridle, noted that the AC confirms the FAA's previous determination that belly bands are acceptable for use in HEC operations. The matter was called into question in 2012, when the FAA was threatening to remove belly bands from the market until members of industry, including UPAC, persuaded the agency to reconsider *(see p.36, Vertical, Oct-Nov 2014)*.

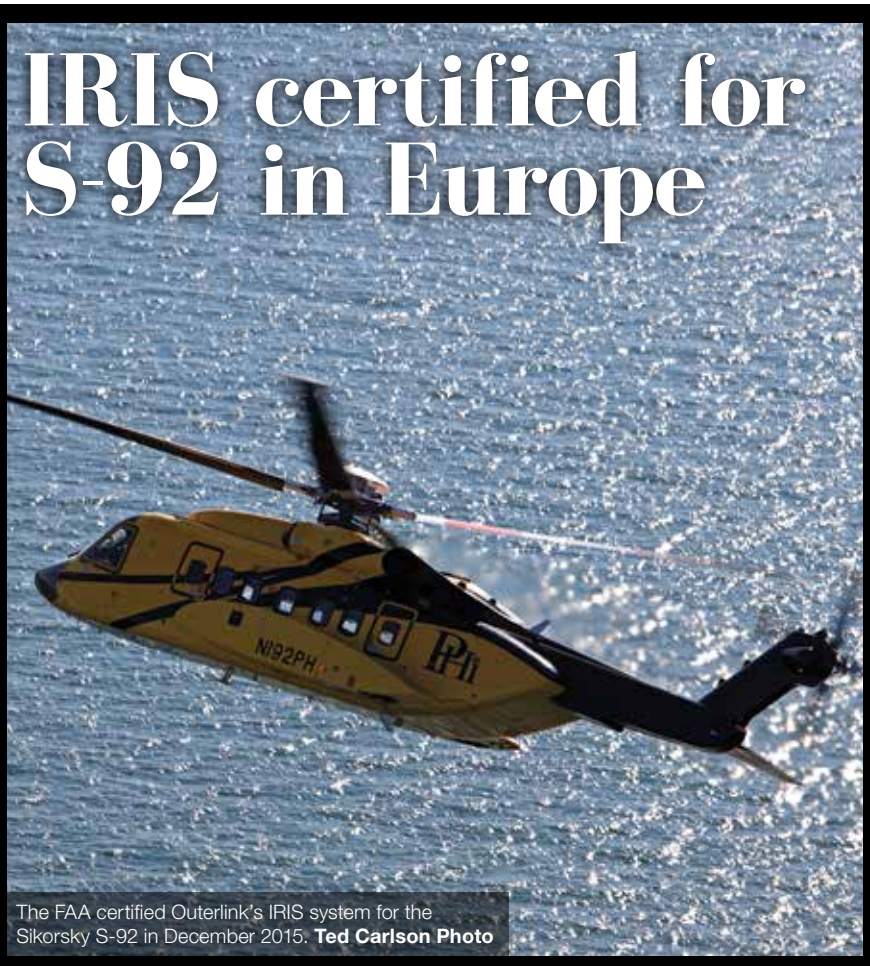
Cockell said he thinks the new AC is "a great thing" for the industry, providing clarity to part 133 operators as well as to the FAA Flight Standards District Offices charged with overseeing them.

"I think that it gives a standard to meet that says look, if you're going to do this, here are all of these parts and pieces that will make you safer," he said. "That's ultimately the goal, to make your operations safer for the people in the aircraft, and obviously under the aircraft."

Yarnold and Boost president Derek Thomas pointed out, however, that most operators currently using belly bands may find that their PCDS and quick-release systems do not fully comply with the additional cargo hook equipment upgrades specified in the AC. Through Boost, Yarnold and Thomas developed a dual-hook HEC system that has been certified by both Transport Canada and the FAA, and they know from their certification experience that meeting the more stringent requirements isn't easy.

"The amount of work that we went through just [for the fatigue evaluation] of the system was absolutely insane," said Yarnold. "But this is what drove our approval in the first place, is all of these things [in the AC]. We feel validated."

IRIS certified for S-92 in Europe



The FAA certified Outerlink's IRIS system for the Sikorsky S-92 in December 2015. **Ted Carlson Photo**

The European Aviation Safety Agency (EASA) has certified Outerlink's IRIS system for installation on the Sikorsky S-92 aircraft. IRIS includes a full-duplex communications service combined with the rotorcraft industry's first satellite-transmitted, real-time flight data monitoring system that provides a total solution to safety and management oversight.

The Federal Aviation Administration certified the IRIS system for the S-92 in December 2015.

In addition to the recorded data, IRIS provides an always-on, always-connected signal that allows communication specialists to monitor an aircraft's activities in real-time, communicate with pilots though global push-to-talk radio and receive immediate alerts and warnings from the cockpit. GPS tracking reports are provided through L-Band satellite or Iridium.

During this year's Heli-Expo in Dallas, Texas, Outerlink, Sikorsky and PHI announced the launch of a pilot program to further enhance safety in the rotorcraft industry with real-time helicopter health and usage monitoring systems (RTHUMS). RTHUMS allows commercial helicopter operators the ability to view and track the aircraft in real-time, and provide additional information to support operational and maintenance decisions.

Outerlink is a Metro Aviation company, and Outerlink's IRIS system is currently being installed on the air medical operator's entire domestic fleet. "We are excited to bring this technology to Europe," said Metro president, Mike Stanberry. "IRIS is an absolute game-changer for the industry. In terms of safety, we are delivering a solution that provides all the tools you need for operating a safe fleet."

EASA validations for the EC135 and EC145 are expected shortly.

Era and Bristow to keep H225 fleets on the ground

Bristow has 27 H225s in its fleet, but said it would be "very cautious" before returning the type to service.
Heath Moffatt Photo

BY OLIVER JOHNSON

Two major operators in the offshore oil-and-gas transport sector have said their H225 fleets are to remain grounded in the near term, despite the directives issued by the U.K. and Norway civil aviation authorities (CAAs) that allowed the aircraft to return to service in those countries.

Bristow, which operates 27 of the type, and Era, which owns nine, saw their H225 fleets grounded following the fatal crash of a CHC-operated H225 near Turøy, Norway, on April 29, 2016, which claimed the lives of all 11 passengers and two pilots on board after the main rotor separated from the fuselage.

The crash remains under investigation by the Accident Investigation Bureau of Norway, but the agency believes a fatigue fracture in one of the second stage planet gears in the aircraft's main gearbox was the most likely cause.

"As of today, there is not a lot of demand for the Airbus H225 to conduct offshore transportation missions, mostly because of macro oil-and-gas marketing conditions, and the understandable concern over the aircraft in transport mode by our oil-and-gas clients, especially in the North Sea," said Jonathan Baliff, Bristow's CEO and president, in a conference call with investors on Aug. 4.

"Bristow is going to be very cautious, very deliberate, and very methodical as we develop and implement a return to service, or RTS, for the H225. We will complete an extensive safety case before any flight takes place, even test flights. And we are committed to collaborating with HeliOffshore, our clients, and our passengers and their unions as part of any RTS plan."

In a conference call discussing Era's second quarter earnings on Aug. 9, company president and CEO Chris Bradshaw said customers needed to be confident in the aircraft before Era could restart operations with it.

"Beyond regulatory approval and the completion of the accident investigation, the other key milestones for a potential broad-based return to service of these helicopters include confidence amongst the helicopter operators, our oil-and-gas customers, and the labor unions representing their employees," he said.

"Era will not operate the H225 helicopters in our fleet unless and until we can develop a detailed safety case that demonstrates the aircraft can be operated safely."

That safety case is one of the steps mandated by the U.K. and Norway CAAs to allow the aircraft to return to service. The agencies asked operators to complete modifications originally approved by the European Aviation Safety Agency in October 2016 (including a design change to address fatigue failure, improved spalling detection and increased reliability), and then present a safety case proving they had done so and that their technicians are trained and equipped for new maintenance procedures.

According to figures from Airbus Helicopters, only 15 percent of the global fleet of 160 AS332 L2s and H225s flying offshore oil-and-gas operations had returned to service as of early July. In a statement following the lifting of the H225 flight ban from the U.K. and Norway CAAs, Airbus said while it welcomed the move, "we understand that this will not necessarily result in immediate passenger flights as there is a lot of work to be done to restore confidence in the aircraft."

Both Bristow and Era said they had been financially harmed by the grounding. Era filed a lawsuit in November 2016 seeking damages from Airbus related to its purchase of the type, while in his recent conference call, Baliff said Bristow was "monitoring" the ongoing legal process. "When it comes to Airbus, we continue to model all litigation, and are exploring all options with that company."

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ROTOR BITS

UNITED TECHNOLOGIES TO ACQUIRE ROCKWELL COLLINS FOR $30 BILLION

United Technologies has acquired Rockwell Collins, known for its leading-edge avionics, flight controls, aircraft interior and data connectivity solutions.

"This acquisition adds tremendous capabilities to our aerospace businesses and strengthens our complementary offerings of technologically advanced aerospace systems," said UTC chairman and chief executive officer Greg Hayes. "Together, Rockwell Collins and UTC Aerospace Systems will enhance customer value in a rapidly evolving aerospace industry by making aircraft more intelligent and more connected."

Hayes said the integrated companies' expertise in developing electrical, mechanical and software solutions would allow them to deliver more innovative products and services.

The purchase price implies a total equity value of $23 billion and a total transaction value of $30 billion, including Rockwell Collins' net debt.

PHILJETS TAKES DELIVERY OF ITS FIRST BELL 407GX

PhilJets Group has added a new Bell 407GX helicopter to its fast-growing fleet. This is the boutique business aviation group's eighth aircraft.

The aircraft joins four Airbus H130s, one Airbus AS350 B2, and two business jets in the PhilJets fleet.

"Most of our helicopters have forward-facing seat configuration, which are proven to be ideal for tours and sightseeing flights," said Choy Elciario, head of air charter sales at PhilJets. "Now, we can offer club seating experience to our customers who prefer having conversations on board."

Caverton Helicopters buys 8 Bell 407GXPs

Caverton will operate its new Bell 407GXPs in support of oil-and-gas companies located along the West African shefl. **Bell Helicopter Photo**

Caverton Helicopters Limited has ordered eight brand-new Bell 407GXPs to be deployed throughout the company's West African operations. The aircraft add to Caverton's growing fleet of helicopters and mark a milestone in the company's long-term fleet development plan across a diverse range of industries.

"We are delighted to be expanding our fleet and our longstanding relationship with Bell Helicopter," said Josiah Choms, managing director, Caverton Helicopters. "Caverton offers marine and aviation logistics and support services to oil-and-gas companies located along the West African shelf. Identifying the best aircraft to effectively carry out the mission is key and we believe the Bell 407GXP's proven track record, particularly its speed and efficient operating cost, make it the perfect light, single helicopter for this job."

Caverton also signed a support services agreement for the newly-purchased 407GXP helicopters for technical assistance provided by Bell Helicopter's support solution, the Customer Advantage Plan (CAP).

"With nearly 1,400 Bell 407s in operation around the world, the aircraft continues to be a success in global markets with sales steadily growing in Africa," said David Sale, Bell Helicopter's managing director for the Middle East and Africa region. "Together with [Caverton's] fleet of Bell 412EPs, the new Bell 407GXP helicopters will be used for offshore logistics support, maritime and coastal surveillance, emergency medical services and search-and-rescue."

Delivery of the helicopters is due to begin in the fourth quarter of 2017 and continue into 2018.

Caverton Helicopters operates out of a 10,000-square-meter flight facility at the Murtala Muhammed International Airport in Lagos, Nigeria, and several purpose-built facilities in Victoria Island, Port Harcourt, Warri and Cameroon.

The Bell 407GXP, launched in 2015, is an upgrade to the Bell 407 product line that provides an additional 50 pounds (22.5 kilograms) of payload capability, coupled with a new M250 Rolls-Royce engine that improves performance and fuel efficiency. It is also equipped with new avionics features such as hover performance calculator improvement, as well as a transmission time before overhaul extension of 500 hours that is designed to lower maintenance costs.

Blue Sky launches new analytics tools through SkyRouter 3

BY ELAN HEAD

The satellite flight tracking company Blue Sky Network has rolled out new analytics tools for users of its SkyRouter 3 web portal.

SkyRouter 3 already allows Blue Sky customers to track their assets in real time on an interactive map. Now, users will also be able to access valuable flight time reports from the same convenient, cloud-based portal.

"We're very excited," said Blue Sky CEO Kambiz Aghili, who provided an online demo of the analytics tools to *Vertical* in August. Blue Sky has been providing similar demos to existing customers to "very positive" feedback, Aghili said.

Blue Sky's new analytics dashboards allow users to generate numerical and graphical reports of total flight time by asset, region, and fleet over any selected time period. That allows operations and maintenance managers to see at a glance how much their aircraft are flying, and where. Managers can also easily track trends in utilization over periods of days, weeks, or months.

Additional dashboards allow users to see average and maximum altitudes and velocities, and to track types of alerts by region. Although Blue Sky has developed a basic suite of tools for all users, Aghili emphasized that Blue Sky also has the ability to develop custom tools to meet users' needs.

"We are a solutions-driven company," he emphasized. "We are in the business of consultative partnerships with our end users."

Aghili was named CEO of San Diego, California-based Blue Sky in October 2016. He and Gregoire Demory, who is now president of the company, took over the reins from Jon Gilbert, a pilot who founded Blue Sky in 2001.

Aghili earned an MBA from the UCLA Anderson School of Management — where he is also an adjunct professor of entrepreneurship — and a PhD in computer science from the University of California, Santa Barbara. He has both an educational and a professional background in big data, pattern recognition, and analytics, and told *Vertical* he sees great potential for applying that expertise to the aviation world.

Primarily, however, he wants to take an already strong company to the next level. In coming to Blue Sky, he said, "I really wanted to focus on one business, and help grow that business for many years to come."

Blue Sky has made several significant announcements since Aghili and Demory came on board. In June, the company upgraded SkyRouter 3 with other notable features, including new aviation weather overlays and aeronautical chart basemaps.

Later that month, the company announced a strategic data exchange agreement with the maintenance tracking software provider Digital AirWare. The partnership provides for the exchange of Blue Sky flight tracking data — including flight start and stop times and exceedances — to Digital AirWare users, providing them with "a whole new level of automation," according to Digital AirWare CEO and founder Joaquin Demoreta.

Aghili said he looks forward to rolling out more products and services in the near future — all with the goal of helping Blue Sky customers operate more safely and efficiently.

"This is really about understanding what they do and how we can be helpful to them," he said. "We're very young, we're very entrepreneurial, and we move at things very, very quickly."

CHC's new H175 is flying out of the operator's facility in Aberdeen, Scotland, supporting oil-and-gas operations in the North Sea. **Airbus Photo**

CHC takes delivery of H175

CHC Helicopter has taken delivery of its first H175 for use in offshore oil-and-gas operations. Based at CHC Helicopter's site in Aberdeen, Scotland, the H175 can carry 16 passengers in offshore oil-and-gas configuration, and celebrated its inaugural flight to the Ocean Patriot on Sept. 5.

"I am delighted to see the H175 officially take off for our European operation — the first of three in the CHC fleet — and to offer this new-generation aircraft to Shell, for whom we have provided aviation services, in the United Kingdom/North Sea, since 2012," said Mark Abbey, CHC regional director, Europe, Middle East and Africa. "The aircraft can be configured to carry up to 16 passengers allowing CHC to efficiently manage our customers' current North Sea operations whilst also providing a high level of operational flexibility. This is key to customers' needs in the next phase of North Sea oil-and-gas activity."

To support the introduction of the H175 to CHC's fleet, the company has designated the Aberdeen base as its global H175 engineering center of excellence.

"We continue to refine our global fleet to best meet the unique needs of each customer," said Dave Balevic, senior vice president, engineering and operations at CHC Helicopter. "The addition of the H175 allows us to offer the latest aircraft technology. Locating our H175 engineering centre of excellence in Aberdeen will ensure current and future customers benefit from our best in class, global standards and processes."

CHC also signed a contract with Airbus Helicopters for an HCare Smart full-by-the-hour (FBH) contract to support a smooth entry into service for CHC's first medium-twin H175. Under this nose to tail contract, Airbus Helicopters provides all spare parts and repairable items for CHC's H175.

"As we introduce these new aircraft to our fleet, we needed to make sure we were offering both our operations and customers as much certainty as possible," said Dave Balevic, senior vice president, engineering and operations at CHC Helicopter. "The HCare Smart plan allows us to make sure we have the parts we need on hand as we integrate the H175 into our global operation."

With the HCare contract, CHC will also benefit from the support of the Airbus Helicopters Fleet Center in Aberdeen, which provides access to a dedicated local stock of parts to ensure maximum reactivity. This stock is accessible 24/7 to ensure parts are available when needed.

"We are very proud of CHC's confidence in our HCare FBH program to deliver high fleet availability," says Matthieu Louvot, executive vice president of support and services at Airbus Helicopters. "It positions CHC for a very successful operation in Aberdeen backed by Airbus Helicopters' total commitment."

As one of the key services introduced by the HCare Smart offer, the FBH contract comprises the supply of spare parts and consumables, on top of parts-by-the-hour (PBH) coverage. It bundles in one single contract the provision of all parts needed for the maintenance of the aircraft, leading to better cost control and forecasting, coupled with easier day-to-day management for operators.

Today, a global fleet of 15 H175 have flown more than 12,000 hours, with 13 flying oil-and-gas missions — the majority of these in the North Sea, with one operating in the Gulf of Mexico.

Equipped with Helionix, Airbus Helicopters' integrated suite of advanced avionics and four-axis autopilot, the H175 offers enhanced situational awareness and improved operational safety by helping to reduce pilot workload and increasing mission flexibility.

"With full glass cockpit, automated systems, spacious cabin and large windows, the H175 represents a major achievement for AH [Airbus Helicopters], helping to raise the bar in terms of operational efficiency, safety and comfort in offshore operations," said Ben Bridge, executive vice president of global business at Airbus Helicopters.

The H175 has a maximum takeoff weight (MTOW) of nearly eight metric tonnes, a cruise speed of 150 knots and a maximum speed of 165 knots. The aircraft is already in operation with NHV, Pegaso, Babcock and Monacair.

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Luxaviation Helicopters acquires Starspeed

Starspeed has a fleet of 23 helicopters, including the Airbus EC155 and AS365 Dauphin. **Starspeed Photo**

Luxaviation Helicopters has acquired Starspeed, the global helicopter management, charter and training company. The deal is Luxaviation Helicopters' first acquisition since launching in February 2017.

Luxaviation Helicopters will incorporate Starspeed's fleet of 23 helicopters into its own fleet of managed and charter helicopters, providing clients of both companies with an expanded and integrated portfolio of helicopter and jet aviation services from the Luxaviation Group. With Starspeed's fleet, Luxaviation Helicopters now has a fleet of 42 helicopters.

Starspeed, headquartered in the U.K., will retain its identity, leadership and personnel. In a press release announcing the acquisition, Luxaviation said Starspeed will benefit from an expanded back office and the wider breadth of resources that Luxaviation Helicopters can provide.

"We are very pleased to be announcing Starspeed as Luxaviation Helicopters' first acquisition," said Charlotte Pedersen, chief executive officer of Luxaviation Helicopters. "After careful consideration of the market, it was clear to us that Starspeed is one of the best corporate and VIP helicopter management companies in the world, with an outstanding reputation and highest safety standards available."

Starspeed's fleet includes 19 helicopters under management, plus four additional helicopters available for training and charter. Types in the fleet include Sikorsky S-92 and S-76; Airbus Helicopters EC155, AS365, EC145, EC135 and AS350; Leonardo AW169 and Bell 429 helicopters.

"There are clear indicators in the market which suggest that our top-end customers are looking for greater integration in the provision of aviation management services, and this includes the ability to place both fixed-wing and rotary-wing assets under the control of a single management organization," said Simon Mitchell, director and accountable manager, Starspeed. "This agreement allows our clients to benefit from just that."

"As operations become increasingly complex, there is a need to provide a greater scope of support services. By joining Luxaviation Helicopters, a worldwide operator, we have found a cost effective and efficient way to expand and strengthen the foundation services we provide, including efficient charter flights, exclusive VIP charter services, instrument rating and conversion training for qualified pilots wishing to extend their skills. Together, we will be able to achieve far more for our clients than we have been able to previously."

As part of the Luxaviation Group, Starspeed will benefit from access to the Luxaviation Group's global portfolio of partners and clients, 25 world-class fixed-base operator facilities, 15 maintenance centers and the group's global fleet of more than 250 aircraft.

ROTOR BITS

WAYPOINT TO ESTABLISH LEASING PLATFORM IN CHINA

Waypoint Leasing is to establish a leasing platform in the Tianjin Free Trade Zone (FTZ) DFTP area in China as it seeks to develop its presence in the country's growing rotary-wing market.

"We are excited to announce the establishment of this new leasing platform in the Tianjin FTZ as it will enable us to continue to develop our growing business in China," said Philip Stransky, Waypoint's vice president of sales and relationship management, Asia Pacific. "Waypoint executed our first two leases in China this year, and our initiative to establish this platform reflects the importance we place on customers in this market."

Waypoint's portfolio includes more than 145 aircraft for 32 customers in 30 countries with total assets in excess of $1.6 billion. Additionally, Waypoint has firm and option orders with aircraft manufacturers for more than 95 helicopters valued at more than $1.2 billion, to be delivered over the next five years.

ERICKSON APPOINTS NEW CEO

Erickson Inc. has appointed government services veteran Doug Kitani as the company's new chief executive officer and director.

Kitani joined Erickson having most recently served as chief executive officer and director of IAP Worldwide Services. He earned his MBA in Finance and Strategy from Emory University and graduated from the United States Military Academy at West Point. He served as a U.S. Army helicopter pilot (qualified in the UH-1, OH-58, and UH-60 while completing 11 years of active and reserve duty), is a member of AOPA and is a supporter of the Green Beret Foundation.

"As an accomplished aerospace and defense CEO with vast government services experience, Doug brings a unique skill set to Erickson and we feel confident he will be able to leverage Erickson's unique capabilities into new markets while continuing to support and grow our existing relationships," said Erickson chairman Jim Continenza.

TDFM-9100

Multi-Band P25 PHASE II Airborne FM Communications

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CMIG Leasing has now received 20 of its order of 100 Airbus Ecureuil/Squirrel family helicopters, announced at China Helicopter Exposition in 2015. **Airbus Photo**

CMIG Leasing enhances cooperation with Airbus in China

CMIG Leasing and Airbus Helicopters have strengthened their partnership through an agreement signed during China Helicopter Exposition 2017.

The two parties have agreed to deepen their cooperation in civil helicopter operations, including navigational operation and low-altitude air tourism. In addition, both parties are committed to expanding their cooperation to the public services segment, including police aviation, emergency medical services (EMS), and forest firefighting.

As part of this commitment, CMIG Leasing signed a letter of intent for up to two pre-owned H225 helicopters to be used in firefighting missions.

CMIG Leasing is following the terms and conditions of the existing framework agreement announced at China Helicopter Exposition in 2015, which covers a total of 100 Ecureuil/Squirrel family helicopters. To date, 20 of these have already been delivered.

"We're delighted to further strengthen our strategic partnership and extend the cooperation with CMIG Leasing for the civil helicopter industry in China," said Marie-Agnes Veve, general manager of Airbus Helicopters China. "Airbus Helicopters has been present in China for 50 years, as the first Alouette III helicopter entered into the country in 1967. We are committed to the continued development of China's helicopters industry and by working with such great partners, we can all achieve more success together."

CMIG Leasing is one of the most influential helicopter leasing companies in China, as well as a strategic partner of Airbus Helicopters. At the last China Airshow in 2016, CMIG Leasing signed a letter of intent for the new generation, twin-engine H160 helicopter, making them the launch customer in China and strengthening their commitment to China's general aviation industry by fulfilling diversified market demands.

ROTOR BITS

MARENCO SWISSHELICOPTER ANNOUNCES NEW COO

Jan Nowacki has been appointed Marenco Swisshelicopter's new COO. **Marenco Swisshelicopter Photo**

Marenco Swisshelicopter has appointed Jan Nowacki as the company's new chief operating officer. Nowacki had previously served as head of Airbus Helicopters' rotor blade and airframe divisions, with the manufacture of composite parts, structural assembly and equipment, as well as repair activities.

"In my new task, together with a small and very dynamic team, I will be responsible for the planning and implementation of the series production of the SKYe SH09," said Nowacki. "We are producing a very competitive helicopter with high quality and security."

Certification of the SKYe SH09 is expected to begin next year, and the first deliveries are to take place at the beginning of 2019. Until then, and in relation to the series production, Nowacki's tasks will include staffing and building up a highly qualified workforce.

FIRST BELL 407GXP DELIVERED TO SHAANXI HELICOPTERS

Bell Helicopter has delivered the first Bell 407GXP to Shaanxi Helicopter Co. Ltd., a subsidiary of Shaanxi Energy Group. The aircraft is the first of 100 Bell 407GXPs purchased by the company.

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Bristow wins contract for two S-92s in Barents Sea

Together, Statoil and Eni have awarded Bristow a contract for two Sikorsky S-92s — one for search-and-rescue (SAR) operations, and one transport helicopter that can be converted to a SAR helicopter when needed.

Each contract has a duration of five years with options to extend by up to three years.

The two helicopters will serve production, development and exploration operations in the Barents Sea for the two companies, and for Statoil the contracts will be used in connection with the Johan Castberg field, pending an investment decision by the end of year.

The helicopters will also be used to support drilling operations on the Snøhvit field, and in the company's exploration operations in the Barents Sea. The contract will run from September 2018.

"These long-term contracts mean that Hammerfest will be an important helicopter base for us for many years to come," said Philippe F. Mathieu, senior vice president for Joint Operations Support in Statoil. "Hammerfest has the infrastructure and expertise to provide efficient helicopter services, and of particular importance, the helicopter base is close to our operations in the Barents Sea."

The SAR helicopter will be equipped with night vision imaging systems, as well as other search technology, to enhance its rescue capability.

The transport helicopter will be capable of use at short notice in SAR operations. The contract includes services related to crew changes and SAR services.

In recent years, Eni Norge and Statoil have cooperated on the joint procurement of helicopter services in the Barents Sea.

"We look forward to continuing the cooperation with Bristow," said Pål Eitrheim, Statoil's chief procurement officer. "The contract has been awarded following great interest and good competition in the market. At the same time, the cooperation with Eni means that we can use the helicopter resources efficiently, and maintain a sound helicopter service from Hammerfest, with transport and search-and-rescue capacity."

CHC wins giant offshore windfarm contract

CHC Group has signed a contract with DONG Energy to provide aviation services for the first phase of DONG Energy's Hornsea Project One offshore wind farm.

When complete, Hornsea Project One will be the biggest windfarm in the world, capable of supplying clean electricity to well over one million homes. It will be built 75 miles (120 kilometers) off the coast of Yorkshire, U.K., and helicopters will be used to transport workers and equipment both during the construction and operational phases.

Working with Uni-Fly as a sub-contractor, CHC will deliver the six-year deal covering the construction phase as well as the first five years of operations and maintenance of the wind farm.

This includes a transfer service to take people from shore to the wind farm, and also smaller helicopters to transfer people and tools between the turbines and substations.

A combination of Leonardo AW139 and AW169 helicopters, to suit the different phases of the project, will begin flying out of Humberside heliport from April 2018. Both the services and operations for this contract will be based from Humberside, contributing to the expansion and development of the service base and surrounding area.

CHC is to support the construction and operation of the world's largest windfarm with a combination of Leonardo AW139 and AW169 helicopters. **CHC Photo**

"Hornsea Project One will be the first windfarm with a capacity over 1GW, dwarfing the current largest, London Array, at 630MW," said Duncan Clark, senior program director at DONG Energy. "The great distance from shore means we have to do things differently for Hornsea Project One — we can no longer use crew transfer vessels to take people to and from the wind farm each day.

"As wind farms get bigger, and further out to sea, we are seeing many companies deploy their services expertise from oil-and-gas into the growing renewables sector. CHC have decades of experience and we look forward to working with them."

CHC's regional director for Europe, Middle East and Africa, Mark Abbey said: "I am delighted that DONG Energy has selected CHC and Uni-Fly as their aviation partners for this landmark project. This project allows us to build on our capabilities and experience for several other specific projects, including our extensive winch and longline experience in Kazakhstan and our extensive search-and-rescue services.

"We have continued to invest in equipment and training to take on unique projects just like this one and are eager to show how our business and technical skills can support this mission. This also helps drive CHC's long-term strategy to broaden our range of services to the energy market and continue to grow our renewables service alongside our oil-and-gas, and search-and-rescue service."

Several adventurous helicopter pilots took to the skies on Aug. 21 to enjoy a unique view of the total eclipse. **Chopper Guy Photo**

The author, left, and pilot Chris Templeton watch the reappearing sun through eclipse glasses following their "once-in-a-lifetime" flight. **Lina Collado Photo**

Flying in the shadow of the moon

Vertical's Elan Head took a special flight to gain a relatively unique perspective during the recent total eclipse in the U.S.

BY ELAN HEAD

On Aug. 21, a certain number of pilots across the United States earned the right to start a new column in their logbooks: "eclipse time."

I wasn't one of them. But I was close enough, sitting in the back seat of an Airbus Helicopters AS350 behind Helicopter Express pilot Chris Templeton. Next to me was photographer Lina Collado, who had brought along a camera somewhat more professional than the one on my iPhone.

The reason for our flight was simple. If you're in the path of totality for a solar eclipse — as we were in Jackson Hole, Wyoming — and you have access to a helicopter, you should use that helicopter to your viewing advantage. In our case, that meant taking to the air east of the Jackson Hole Airport, where we had a spectacular view of the Teton Range that would soon be overtaken by the moon's shadow.

We knew that watching the total solar eclipse from a helicopter would be a special experience. But we weren't entirely sure what to expect. We understood that it would get dark, of course, but it was hard to picture just how dark — or how totality would appear from altitude, with sunlight still visible on the distant horizons.

The partial eclipse began in Jackson around 10:15 a.m. Templeton prepared the helicopter and called the Jackson Hole control tower to confirm there were no special operations that would impact our flight. The airport did close its runway for a short period before and after totality, but helicopters, luckily, don't need runways.

As we briefed the flight with Collado, nothing seemed out of the ordinary. There had been some high cirrus clouds to the east earlier in the morning, but they had cleared, leaving the sky bright and blue. Only when we stole quick glances at the sun through paper eclipse glasses was it evident that the sun was slowly disappearing.

By 11:20 a.m. — 15 minutes before totality — we were on station, eye level with the Tetons and with mountains all around us: the Absaroka Range extending to the north; the Gros Ventre and Wind River ranges to our south. Even that near to totality, there was still plenty of ambient light, although I could see through my eclipse glasses that the sun had shrunk to a crescent-shaped sliver.

Collado, who was wearing a safety harness for the flight, opened the aircraft's left-hand sliding door in order to shoot without obstruction. That's when I perceived that the shadows on the Tetons had grown sharper, as though the mountains were lit by a blue sunset. (It's also when I remembered to take off my sunglasses.)

The haze layer above the Tetons began to turn blue, then a dark violet-brown. Gradually the sky became darker, and the ground, until only the silhouettes of the high peaks were distinct against the violet haze and a stripe of brightness that extended 360 degrees across the horizon. A few stars and planets emerged in the dark sky.

I had almost forgotten the main event. I leaned over to follow the line of Collado's camera out the open door, and there it was: the black disc of the moon backlit by the glowing, blue-white light of the sun's corona,

more surreal than anything I'd ever seen in nature.

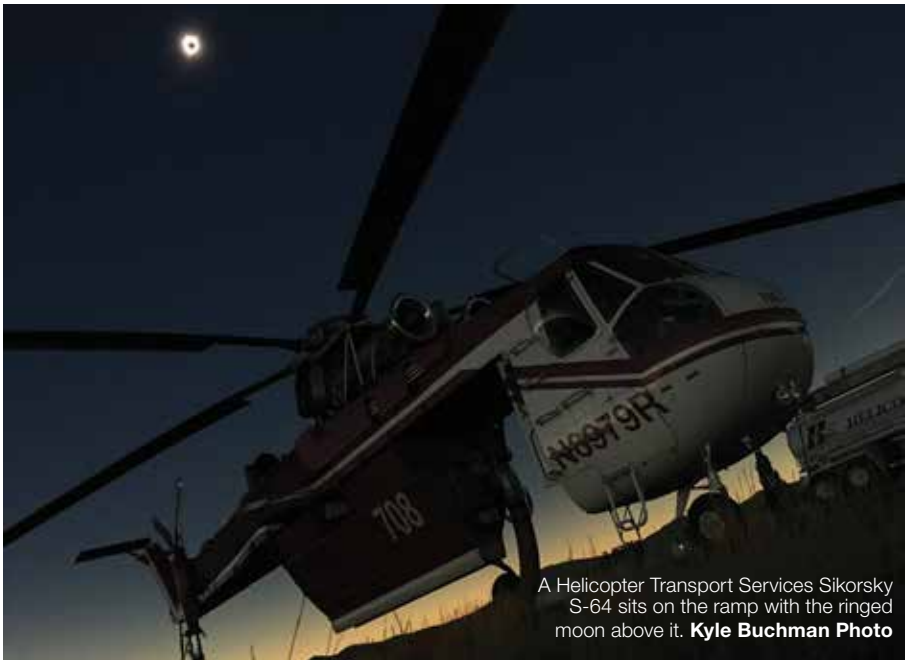
Around the time I was leaning over, marveling at totality, GoPro athlete Chris Farro was leaping from a Robinson R66 helicopter flown by pilot York Galland 40 miles to the west. I didn't realize this at the time — it was only after we had both landed that I noticed a photo on Galland's Instagram. I contacted Galland to get his impressions of watching the eclipse from 12,500 feet.

Galland told me that he, too, had not known what to expect beforehand. "I was not prepared for the drama of it all," he said. "It almost physiologically impacted us." Galland's daughter Margi and GoPro media creator Abe Kislevitz were also in the helicopter taking photos, and "we had planned all the different shots we were going to take," he continued. "But it was so distracting — just the speed with which it went from light to dark."

Writing on Instagram, Farro, who watched totality from the skids of the R66, recalled, "I was so overtaken by the awe of what was happening around us that I almost forgot I was standing on the side of a helicopter. It's hard to explain in words and pictures of what it was like, but skydive or not, it was an experience like no other and one I will never forget."

I later learned that Scott Urschel of Pylon Aviation had also been flying in the area during the eclipse in an MD 530F. "It was amazing to be in the helicopter as the earth went dark and the temperature dropped 25 degrees," he said.

But it was over as quickly as it had begun. It was with disbelief, and then a stab of disappointment, that I noticed the ground brightening below us and realized that totality was over. The Tetons re-emerged as they do at sunrise; in the space of a few minutes, we were back in broad daylight. Templeton told me later that it was only when he flipped the sun visor on his helmet down, and found it unusually dark, that he could tell that the sun was still mostly covered.



A Helicopter Transport Services Sikorsky S-64 sits on the ramp with the ringed moon above it. **Kyle Buchman Photo**

As we descended from altitude and headed back towards the airport, we began to make out all of the other people who had just shared in this incredible event. There were hikers on every hilltop; trucks parked on every dirt road. We passed a dozen ATVs gathered in a circle at the end of a ridgeline, and a lone powered parachute pilot whose aerial experience had probably been even more thrilling than ours. A huge looping contrail appeared in the western sky, evidence of a jet pilot who had maneuvered for a better view.

As we intercepted Gros Ventre Road between Kelly and Highway 89, we saw a long line of cars snaking along this popular bison-viewing road, which had been temporarily restricted to one-way traffic. It was as though Grand Teton National Park and the surrounding wilderness had been the site of a massive sporting event, and thousands of fans were now leaving the stadium. "Everyone was amped up and excited," Templeton later recalled, remarking on how many people were waving at us.

Total solar eclipses will cross the U.S. again in 2024 and 2045, in addition to the other total eclipses that will take place around the world. Based on what I saw this week, I'll likely travel out of my way to catch another one, if I'm lucky enough to have the opportunity. Yet I tend to agree with Templeton that our flight this week was "a once-in-a-lifetime event." With the Tetons as our backdrop and a helicopter as our vantage point, it's hard to imagine ever getting quite the same view again.


The line of totality for the "Great American Eclipse" passed through Jackson Hole, Wyoming. **Margi Galland Photo**


A long line of cars formed on the ground as eclipse-watchers swarmed to view the spectacle at Grand Teton National Park. **Lina Collado Photo**

H135 with Helionix lands with first civil customer

The Norwegian air ambulance operator Norsk Luftambulanse AS (NOLAS) is the first civil customer to receive an Airbus H135 equipped with Helionix. Six additional H135s with Helionix will be delivered to NOLAS in 2017 and 2018. The U.K. Ministry of Defence was the first military customer to receive the new H135 with Helionix in December 2016.

NOLAS won a national HEMS (helicopter emergency medical services) tender in Norway in 2016, and will operate a total of 12 bases and 17 new helicopters from June 1, 2018.

All helicopters are equipped for 24/7 operations with state-of-the-art configuration for single pilot instrument flight rules/night vision imaging system operation, Aerolite interiors and the latest medical equipment.

The H135 obtained European Aviation Safety Agency certification for the Helioix avionics suite in November 2016.

Norsk Luftambulanse has taken delivery of the first of seven H135s equipped with the Helionix avionics suite. **Airbus Photo**

BLR Aerospace receives ANAC certification for H125 FastFin System

BLR Aerospace's FastFin tail rotor enhancement and stability system has been certified by Brazil's Agência Nacional de Aviação Civil for installation on Airbus H125 helicopters.

The H125 FastFin System was certified in late 2016 by the Federal Aviation Administration and has also received approval from the European Aviation Safety Agency. The system is available to the aftermarket and as a factory-installed supplemental type certificate option on new Airbus H125 helicopters.

Thirty H125 FastFin Systems have been sold to operators in Europe and North America. "BLR is gratified to bring the FastFin System to H125 operators in Brazil," said BLR president Mike Carpenter. "It's a proven, value-enhancing technology that helps make missions more efficient and productive."

ROTOR BITS

Héli-Union Photo

HÉLI-UNION OBTAINS EASA CERTIFICATION OF AS332 L1 LPV CAPABILITY

Héli-Union has successfully obtained the first European Aviation Safety Agency (EASA) certification of a localizer performance with vertical guidance (LPV) capability on Airbus Helicopters AS332 L1 aircraft, with both digital and analogue systems. Normally, an LPV capability on AS332 L1 utilizes either a digital or an analogue system.

At the time of certification, Héli-Union was the only company that had been approved by EASA to apply such LPV capability on AS332 L1 type helicopters.

An LPV approach is a modern instrument approach procedure that uses wide area augmentation system (WAAS) and very precise GPS capabilities to attain an aircraft's position. This approach increases position sensitivity as the aircraft approaches runways, enabling the aircraft to be flown completely by the autopilot.

JSSI ADDS HELICOPTER PROGRAMS

Jet Support Services, Inc. (JSSI) has introduced airframe parts-only coverage for the Sikorsky S-76C, S-76C+, S-76C++ and S-76D helicopter models to its portfolio of maintenance.

Today, JSSI offers tip-to-tail, engine, airframe, and auxiliary power unit coverage for more than 350 different aircraft models, including more than 75 helicopters.

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Thales bets on China's appetite for simulators

BY THIERRY DUBOIS

Haite Group, a Chinese company specializing in aviation services, recently inaugurated a flight training center in Tianjin featuring a Thales Reality H EC135 full flight helicopter simulator. Thales sees the delivery as the first in a long series to come.

The center will be instrumental in meeting the increasing demand for helicopter pilot training in China, Thales said. In that instance, the Paris-based company's role is only that of a supplier. But it has had a long relationship with Haite Group, Benoit Plantier, Thales vice president, training and simulation activities, said.

The simulator Haite Group has received sports Thales' Hexaline electric motion system, for lower maintenance cost.

The Civil Aviation Administration of China (CAAC) certified it as a Level D simulator. "The CAAC's requirements are similar to those of the European Aviation Safety Agency, but this was their first EC135 simulator so they want to understand in depth, they ask for more explanation and documents," Plantier said.

Thales expects Haite Group will order more simulators, and said they would support H135 fleet growth in the country.

Meanwhile, Airbus Helicopters is building its first final assembly line in China, where it will produce H135 light twins. The EC135 is the predecessor of the H135 so, for Haite Group, buying an H135 simulator was the next logical step.

Thales has delivered the first EC135 simulator in China, where helicopter EMS activity is growing. **Thales Photo**

China was the manufacturer's first single market in 2016. The country is estimated to need thousands of civil helicopters over the next 20 years for applications such as emergency medical services, for which the EC135 and the H135 are well suited. Airbus Helicopters is claiming a 40 percent market share in China's civil helicopter market, with 260 rotorcraft. The long-discussed deregulation of the lower airspace, needed for the helicopter industry to thrive, is beginning in earnest, according to Plantier.

ROTOR BITS


Oceania Aviation Photo

OCEANIA AVIATION GAINS FAA STC FOR H125 EXTERNAL CARGO POD

Oceania Aviation Limited, headquartered in Auckland, New Zealand, has announced that its Part 145 manufacturing division, Airborne Systems, has obtained a Federal Aviation Administration supplemental type certificate for its Airbus H125, AS350 and AS355 series cargo pod.

The fully composite cargo pod utilizes state-of-the-art materials designed for strength and lightness, and can carry 265 pounds (120 kilograms).

Airborne Systems first gained Civil Aviation Authority of New Zealand STC approval for its AS350 series cargo pod in December 2011, followed by the AS355 series in December 2012.

Garmin receives EASA approval for new GTN 650/750 features


Among the enhancements to the GTN 650/750 are pinch-to-zoom and Flight Stream 510 integration. **Garmin Photo**

Garmin has announced an expanded feature set, an enhanced user interface and additional wireless connectivity solutions for its popular GTN 650/750 touchscreen navigators. New GTN enhancements include pinch-to-zoom and Flight Stream 510 integration, which supports wireless Database Concierge between the GTN and the Garmin Pilot app on a mobile device.

Flight plan transfer, as well as traffic, weather, GPS information and more also display on select mobile devices when paired with Flight Stream 510. Pilots can also utilize the Garmin Pilot app on Apple mobile devices to send text messages and initiate phone calls.

The GTN software upgrade is supported by Garmin's aviation support team, which provides 24/7 worldwide technical and warranty support.


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Sikorsky celebrates first anniversary of Stavanger FSL

Sikorsky is celebrating the first year of operations for its Stavanger, Norway-based Forward Stocking Location (FSL). The Stavanger FSL supports the largest S-92 helicopter operating region in the world and provides quick access to materials and parts.

The event was attended by the Mayor of Sola, Ole Ueland, Sikorsky's commercial customers, off-shore oil union members, as well as Sikorsky's commercial leadership.

Since beginning to serve Scandinavian operators in September 2016, the FSL has averaged a response time of less than one hour for requests for parts. More than 1,300 various part numbers for S-92 helicopters are stocked in Norway.

The first anniversary event for Sikorsky's FSL in Stavanger was attended by the Mayor of Sola, as well as Sikorsky customers and leadership.
Sikorsky Photo

ROTOR BITS

BELL HELICOPTER BEGINS DELIVERY OF 9 505s TO CHILE

Bell Helicopter Photo

Bell Helicopter has delivered two Bell 505 Jet Ranger Xs to Eagle Copters' South America headquarters in Santiago, Chile. The aircraft will be used for corporate transportation.

"We are excited to announce the first two of nine Bell 505s have been delivered to our friends at Eagle Copters South America," said Jay Ortiz, vice president, Latin America. "The Bell 505 is the choice aircraft for those who are travel savvy and require a quiet cabin to conduct business during flights."

Company officials see growth for the Bell 505 in the corporate, tourism and light utility sectors.

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

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.

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Vertical
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THE PULSE OF THE HELICOPTER INDUSTRY

Jan Elbe has been flying helicopters for almost 60 years, recording well over 20,000 hours in his logbook. He began his aviation career in the German Air Force in 1958, and subsequently moved to Canada, where he became heavily involved in the development of the fledgling heli-skiing industry. He has been recognized with numerous awards for his flying over the years, including Helicopter Association International's Robert E. Trimble Memorial Award for mountain flying.

JAN ELBE
HELI-SKI PIONEER

INTERVIEWED BY OLIVER JOHNSON

***Vertical:* Had you always wanted to be a pilot?**

Jan Elbe: Yes. When I was maybe 10 or so I got a little diesel model airplane for my birthday, so I started building model airplanes. After building lots of model airplanes — and crashing them — I was really hooked on becoming a pilot. When Germany became sovereign after the military government was replaced by a civilian government, they started the military again. I saw my opportunity, because obviously we needed some pilots. I had just finished high school when I applied and got accepted.

I wanted to fly jets but I was too tall — I was 6'4". Everybody in my company wanted to become a pilot, but the flight school's training courses were full. In the meantime, they stuck us wherever, and it was usually on guard duty.

One morning I came off guard duty, and saw a notice looking for volunteers to go and fly helicopters. I signed up right away. Within four or five days I was flying a Bell 47 G2. And don't forget that was in 1958 — in the early days of the helicopter's evolution. It was just amazing how quickly it happened.

***V:* How was that experience?**

J.E.: The commander at the school said, "We can teach your grandmother how to fly, but that's not our target or goal here. We want to evaluate your natural talent and see how you perform under pressure." And that's what it was. There wasn't a dull moment — it was just continuous pressure to perform. There was hardly a circuit where the instructor didn't roll the throttle on you.

There were certain goals you had to meet, like hovering solo after seven hours. If you failed to meet a goal, you had another hour of flying with a different instructor, and if you failed that, you were out of flying — period. There were pilots on the final check ride, at 120 hours, that failed twice and were gone. I think something like that should be applied to commercial flying, not necessarily as tough, but some measuring stick standard, because there are some people out there that shouldn't be near a helicopter, let alone fly it. I think if they would increase the standard of testing by 20 percent, it would reduce the accident rate by 50 percent, minimum.

Eighty-five percent of all accidents are human error. And that is because of pure lack of training. The emphasis should be on on-the-job training.

***V:* You spent many years training pilots in Canada. Was on-the-job training central to that?**

J.E.: I did heli-skiing for a number of years, and that's basically a situation where we're asking for something to happen, right? I initiated a pilot training program every heli-ski season, so that I worked with anybody that was new to heli-skiing for about a week or whatever it took to make sure that they knew exactly what to do, how to do it, and where to do it. And also that they were comfortable with winter flying, with whiteout weather, and all kinds of conditions that you don't encounter in the summer. When you know what you're looking at, what to do, and how to do it, it takes 99 percent out of those conditions out of play. If you've done it with somebody who has shown you how to do it — and you did it yourself — then the unknown factor is gone.

***V:* What sort of things were you doing in the German Air Force?**

J.E.: I was in a rescue squadron and flying a Bristol Sycamore. It was an English piston helicopter equipped with a winch. I did my first rescue on the hoist with 183 total hours. In the military, you get the training, and then once it's considered that you can do the job, you go and do it.

***V:* Where were you flying?**

J.E.: That was during the height of the Cold War, in the late '60s, early '70s. In Germany, there were a lot of fighter aircraft all over the place. Basically, each fighter squadron had search-and-rescue helicopters assigned to them. If they were to have a problem and had to bail out, we would go and pick them up.

My first winch rescue wasn't picking up a fighter pilot. I pulled a civilian off the roof of a burning house.

***V:* How was the Sycamore to fly?**

J.E.: It was quite a helicopter. It was certified in '49. It was fairly quick, with an empty weight of about 6,000 pounds. It had an Alvis Leonides radial engine that was mounted horizontally in the middle of the cabin, which was quite a strange arrangement.

It didn't have a mast — the rotor head was mounted right on top of the transmission — so the C of G range was zero. The fuel tanks were behind the C of G, so as you were burning off fuel, you had to pump a glycol-water mix between two five-gallon tanks — one in the nose, another in the rear — to balance the aircraft and maintain controllability.

The aircraft's performance wasn't the greatest. I remember lifting a guy out of dinghy on a lake up in the hills. It was nice and hot. As soon as the weight of the guy was completely on the winch, the helicopter was winched down rather than the guy up.

***V:* How did you end up moving across the Atlantic to Canada?**

J.E.: I met some Canadian pilots while I was flying for a Dutch company in Africa. They recommended coming to Canada as there were a lot of helicopters and jobs. That was in the Spring of '65.

I landed in Toronto with an immigration visa, and when I told the immigration officer what I was looking to do, he opened the

Yellow Pages and started calling the helicopter companies in alphabetical order. It was a long weekend, so many people had already gone home. Someone answered at Spartan Helicopters, and I was hired on the spot over the phone.

V: You ultimately moved to Calgary and built quite a reputation as a mountain pilot. What were you flying there?

J.E.: At Bullock Helicopters — which later became Bow Helicopters — they had lots of Alouettes and a Bell 47G, so that's what I flew initially. I soon managed to get a 204 endorsement while up in Inuvik on a job, and then basically didn't fly anything else for the rest of my career. I also flew the Bell 205, 212, 214, and Sikorsky S-61 in between. That was basically it — pretty much Bell mediums all the way.

V: What's your favorite type?

J.E.: The AStar, all the way. I went to France to look at the Puma in '76, and while I was there, they also showed me the AStar, which was in the test flying phase. They had the number three prototype, and that was the machine that they actually let me fly. And I was just blown away. I mean, it was just amazing. The machine was nice and smooth — and quiet. It just flew like a charm. As soon as I got back to Calgary, I wrote a glowing report about it. We ordered six once it was approved by head office.

V: How did heli-skiing change over the years?

J.E.: The 204 was basically the breakthrough in the skiing industry. With a 47, it would take about two hours to take a group of eight skiers 5,000 feet up a mountain, but just 10 minutes with the 204 due to its size and performance. There was no comparison.

Even in bad weather conditions — say it's snowing and maybe half a mile visibility — you slowed it down, but you could still climb at 500 feet a minute. Because of the power and ability of the helicopter, you could adapt to the weather conditions.

We developed landing spots for the various runs, so before the season started, during the training week when we trained the new guys and pilots, we marked all the landings. We set these flags for wind indications, so in bad or good weather you had a target to aim at — it gave you a visual reference and a safe and level place to land.

Because I had flown two years prior to doing heli-skiing in the Arctic, whiteout, snow and all that bad winter weather was nothing new to me. The norm before the 204 was that you may ski two or three days out of seven because of the weather, and once the 204 came in, you may not ski only on two or three days throughout the entire season.

V: Are you still flying today?

J.E.: Yes, I just passed my medical again. I'm working with Eagle Copters. It's not full time — I just go in whenever needed to fly the aircraft after they've completed maintenance.

V: Do you still enjoy flying as much as when you started you career?

J.E.: I always say I never worked a day in my life. I could never wait to get up in the morning to go flying. The night was too long. That feeling has diminished a little, but not a lot. There will come a time when I have to stop because I don't pass my medical, but I also have a personal limit — once I feel I can't do it anymore, I'll quit. I'll stop before then.

This interview has been edited and condensed.

Around the world IN 48 DAYS

Helicopter pilots Bob and Steven Dengler circled the globe to mark Canada's 150th birthday. They brought a lifetime's worth of memories home with them.

By Ben Forrest

*Watch the video **here!***

Bob, left, and Steven Dengler stand with the Bell 429 helicopter they used to circumnavigate the globe. **Peter Bregg Photo**

The helicopter rests during a stop in Nome, Alaska. **C150 Global Odyssey Photo**

Many remote locations were included in the itinerary, giving the pilots a new sense of perspective. **C150 Global Odyssey Photo**

Steven was able to meet and converse with locals in the port town of Magadan, Russia, making it a memorable stop. **C150 Global Odyssey Photo**

Flying through Russia was a highlight for both Bob and Steven. Here, the helicopter rests in the Russian city of Irkutsk. **C150 Global Odyssey Photo**

Bob's Bell 429 (center) flies in formation over Iceland. **Baldur Sveinsson Photo**

The frigid waters and snowy peaks of Greenland made for beautiful scenery. **C150 Global Odyssey Photo**

A few days removed from a potentially historic helicopter journey around the world with his son Steven, Bob Dengler struggled to believe it had happened.

Bob and Steven, both successful businessmen and accomplished helicopter pilots who live in southern Ontario, touched down in Montreal, Quebec, in Bob's Bell 429 helicopter on Aug. 17, 2017.

It was the final stop in a more than 23,000-mile (37,000-kilometer) journey that took them to every Canadian province, as well as Greenland, the United Kingdom, France, Russia, Alaska and other places in what they hoped would be the first circumnavigation of the globe by Canadians in a helicopter.

If certified by the Federation Aeronautique Internationale (FAI) in Switzerland, the Denglers believe they will also become the first father-and-son pilot duo to have circumnavigated the globe in any aircraft.

"It's something that we don't want to forget," said Bob. "I think it was quite an achievement, and it's done, we're home, and we're all safe, and that's the good part.

"We flew around the world. . . . It's surreal. Hard to believe it all happened."

The feeling was different for Steven, who together with his wife Bruna put more than a year of planning into the 48-day journey.

"It's the natural fruit of a lot of hard work from a lot of people," said Steven. "It will always be one of the most amazing experiences of my life, and I just have immense gratitude to all the people that helped it — who really stood to gain nothing from it, except a sense of pride and involvement."

Titled the C150 Global Odyssey because it coincided with the 150th anniversary of Canadian Confederation, the journey began July 1 in Vaughan, Ontario, near Toronto and moved east to the Canadian Aviation and Space Museum in Ottawa, part of the city's massive Canada Day celebrations.

Dave Williams, a retired Canadian astronaut, flew with the crew from Vaughan to Ottawa, and the Denglers continued on to Montreal, where they picked up Hockey Hall of Famer Guy Lafleur, a friend who is also a long-time helicopter pilot. Lafleur stayed aboard until a stop in Fredericton, New Brunswick, said Bob.

Also joining them at the initial stop in Montreal was Rob "Dugal" MacDuff, a retired Bell Helicopter test pilot who stayed with them for the remainder of the journey, serving as a safety pilot.

As a way of paying tribute to key moments in Canadian history, the journey made several stops in historically significant places, including Baddeck Bay on Cape Breton Island, site of the first airplane flight in Canada by J.A.D. McCurdy in 1909.

McCurdy's grandson Gerald Haddon, who is also a former honorary colonel of the Canadian Forces School of Aerospace Technology and Engineering at 16 Wing Borden, Ontario, was aboard the Bell 429 as it overflew Baddeck Bay, according to Bob.

Other key stops included the Canadian National Vimy Memorial in France, where the pilots delivered a wreath honoring Canadians who fought in the Battle of Vimy Ridge, as well as a wreath honoring Newfoundlanders who fought in the Battle of the Somme.

The Newfoundland wreath was subsequently delivered to Beaumont-Hamel in France, said Bob, site of the Newfoundland Regiment's tragic advance on July 1, 1916, an event that has become a symbol of the regiment's valor and terrible wartime sacrifices.

The pilots also carried a brick that, according to Bob, was part of the original building where Guglielmo Marconi is believed to have sent the first transatlantic radio signals in 1901. After a ceremony in Newfoundland that recreated that first transmission, they delivered the brick to Poldhu, England, where the 1901 message is said to have been received.

"A lot of saluting, a lot of historical significance in my opinion," said Bob.

Getting to Europe was a challenge due to the weather, he added. They endured a five-day weather delay in Iqaluit, Nunavut, before flying north to the top of Baffin Island and across the North Atlantic Ocean to Greenland.

Another day was lost due to weather before they could fly to the northeast side of Greenland and then across to Reykjavik, Iceland. After yet another delay they continued to the Faroe Islands and then to Scotland, England, France and Prague in the Czech Republic, where they completed the first of two 50-hour maintenance stops at a Bell Helicopter facility.

They continued through Russia, then made an instrument flight rules (IFR) flight into Nome, Alaska, and from there to Whitehorse, Yukon, for a second 50-hour maintenance stop at Trans North Helicopters.

The journey moved east to Yellowknife, Northwest Territories, and then south to Fort St. John, British Columbia, and east again through every other Canadian province before wrapping up in Montreal. They had hoped to visit every provincial capital in Canada but were unable to visit Victoria, British Columbia, due to this summer's devastating wildfires.

"We did get into Fort St. John, where we were met by the mayor," said Bob. "We said, 'We'd like to declare Fort St. John an honorary capital of B.C. to say that we'd gone to the capital of every province. And she said, 'Well you can just drop the honorary title.' "

Their inability to stop in Victoria is not expected to affect the journey's status as an official circumnavigation, though confirmation was still pending as *Vertical* went to press. If the journey is certified, Bob and Steven expect to be notified sometime in the fall of 2017.

"Whether or not I get a piece of paper at the end of this really is not that important," said Steven, referring to the circumnavigation diplomas the FAI may provide.

"I mean, the fact that we did this together, and the fact that this was an opportunity that I got that very few people ever get — that's what's important.

"The stories, the people I met, the way I personally grew — I don't just mean as a helicopter pilot, I mean as a person along the trip — that's an incredible experience."

Steven made a point of exploring at virtually every stop, meeting people and conversing with them. He cited those interactions as the main highlight of the trip.

Both pilots spoke effusively about the Bell 429's performance, with Bob saying it couldn't have been better.

"I'm incredibly impressed by that helicopter," added Steven. "The design team should be incredibly proud. They have one of the most advanced helicopters in the world, and it's a dream to fly."

This was a trip that stretched them as pilots and helped them grow as people, something they will likely never forget. Whether or not it seemed surreal in the days afterward, it was full of the kinds of memories most pilots will never have.

"I've had the opportunity to meet amazing people all around the world that, without a doubt, will be friends for the rest of my life," said Steven.

"What do I think of it from the other side? It's gratitude. I'm just so incredibly grateful to have had the opportunity to do this … and it's humbling.

"It's humbling to think that you get to ride in that helicopter around the world, and so many people are working hard to make that happen."

Editor's note: This story originally appeared in the September/October issue of Skies Magazine, Vertical Magazine's sister publication.

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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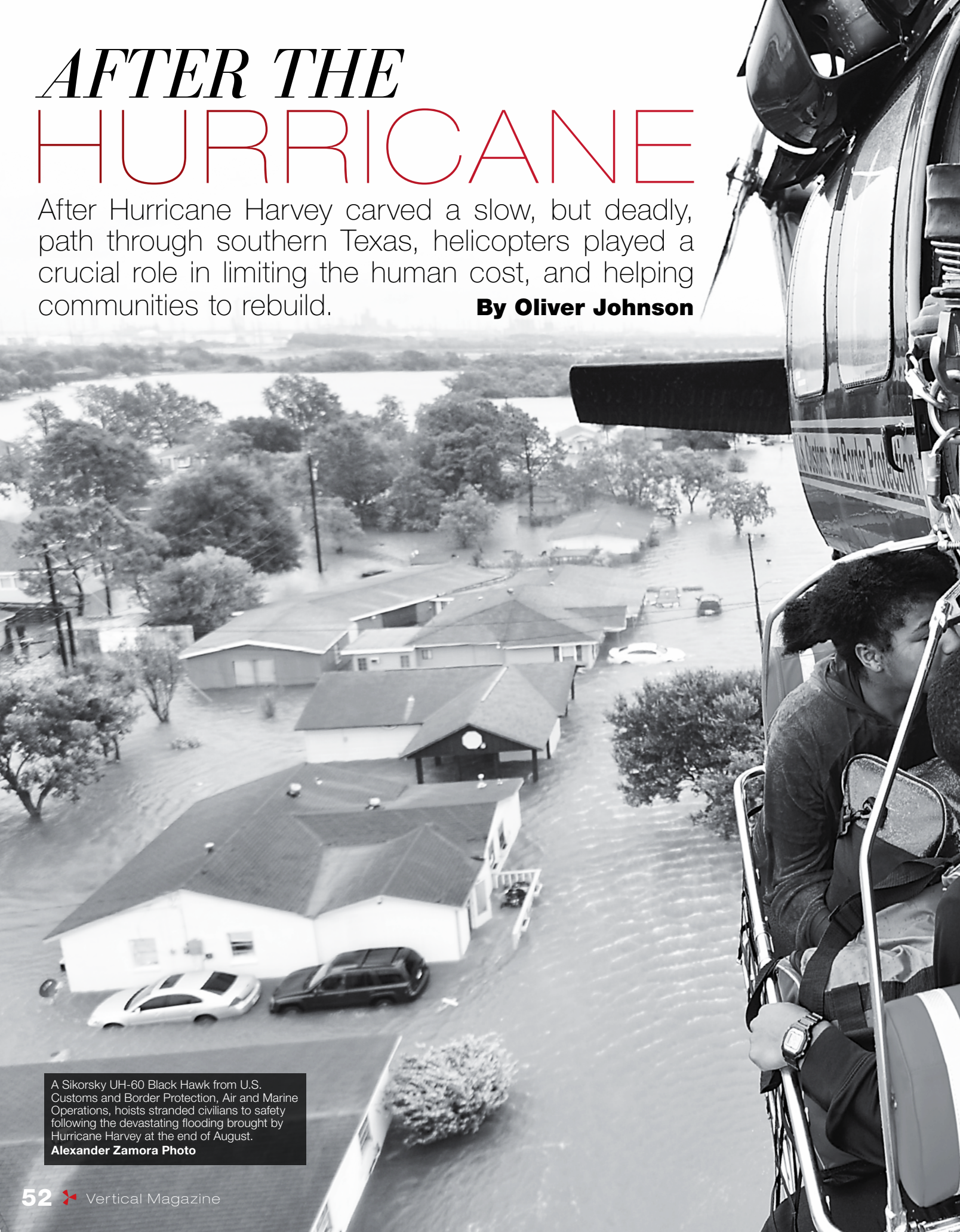
AFTER THE HURRICANE

After Hurricane Harvey carved a slow, but deadly, path through southern Texas, helicopters played a crucial role in limiting the human cost, and helping communities to rebuild.

By Oliver Johnson



A Sikorsky UH-60 Black Hawk from U.S. Customs and Border Protection, Air and Marine Operations, hoists stranded civilians to safety following the devastating flooding brought by Hurricane Harvey at the end of August.
Alexander Zamora Photo

At 10 p.m. local time on Saturday, Aug. 25, Hurricane Harvey became the first major hurricane to make landfall in the U.S. in 12 years. The storm, which had slowly gathered strength as it bore down down upon the coastline of Texas, hit the small Gulf Coast town of Rockport as a Category 4 hurricane, bringing winds of 130 miles per hour (215 kilometers per hour). Then, rather than move inland, the storm stalled over south and southeast Texas for days, with some areas receiving more than 40 inches of rain in less than 48 hours.

The strong winds, persistent rain, and resulting flooding devastated the city of Houston, as well as many surrounding towns and cities. According to officials, the destruction caused at least 80 deaths, displaced more than one million people, and caused more than $100 billion in damage.

The response from across the U.S. was swift, with resources and support pouring into the Lone Star State even before Harvey made landfall. And helicopters played a key role.

According to U.S. Northern Command, there were 73 helicopters deployed with active-duty units to assist in the recovery and response operation following Hurricane Harvey. These included Bell-Boeing MV-22B Ospreys, Sikorsky CH-53E Super Stallions, and Bell UH-1Y Hueys. These were joined by dozens of National Guard helicopters from across the U.S., including the Sikorsky UH-60, Boeing CH-47 Chinook, and Airbus UH-72 Lakota.

The U.S. Coast Guard also played a key role in the operation, providing rotary-wing support in the form of its Airbus MH-65 Dolphins and Sikorsky MH-60 Jayhawks. Rear Admiral Paul Thomas, commander of the Coast Guard 8th District, called the response "one of the largest our organization has seen in decades."

U.S. Customs and Border Protection (CBP) Air and Marine Operations (AMO) also brought 23 helicopters to assist the operation, from Airbus AS350 AStars to UH-60s.

This enormous rotary-wing fleet was joined by numerous civilian aircraft, with air medical operators Air Methods and Med-Trans bringing large numbers of emergency medical services (EMS) aircraft from across the country to assist in the evacuation of southern Texas hospitals.

Vertical spoke with a handful of those organizations that took part in the Harvey response about their work in the Houston area and the challenges they faced.

ALWAYS READY

The USCG responded to the disaster in force, with 44 helicopters among the assets it contributed to the rescue effort in southeast Texas and southwest Louisiana. Across the service, Coast Guard men and women rescued 11,022 people and 1,384 pets during the operation.

Lieutenant Daniel Crowley, assistant operations officer at Air Station Houston, flew 13 rescues during the recovery operation in an MH-65D.

"The weather conditions were easily the worst I have ever flown in," he told *Vertical.* "Winds consistently above 25 knots, gusting as high as 50 from seemingly random directions. I saw the worst downdrafts I have ever encountered. We would establish a hover with what we anticipated was an ample power margin. However, even with a 20 percent margin, the downdrafts and gusts would create momentary excursions right to our maximum torque limit."

Lt. Crowley said flying in an urban environment — as compared the Coast Guard's usual work over the ocean — was a completely different animal.

"Many of our normal habits and safeguards are obsolete in the overland environment. Real-time risk management was crucial. Being stationed in the area, I was familiar with many of the potential obstacles. When I briefed incoming crews I really tried to emphasize that this

CBP brought 23 helicopters to southern Texas as part of the relief effort, including three Black Hawks from the AMO's office in Tucson, Arizona. **Donna Burton Photo**

would be one of the most challenging areas they would ever operate in, particularly at night. There are *a lot* of towers in the Houston area, many as high as 2,000 feet."

Aviation survival technician Daniel Strange, also of Air Station Houston, highlighted the new challenge of deploying out of a helicopter with an axe or a chainsaw to clear debris, and avoiding hazards in the water below that included fire ants, fuels slicks and sharp objects.

In terms of a noteworthy rescue, he recalled hoisting down to pick up two people standing in almost chest-high water in the middle of a cul-de-sac at the end of day's flying. While the helicopter took the pair to safety and to refuel, he went door-to-door to check on the people left in the neighborhood.

"I found a house that had 11 people — consisting of two adult females and nine children — who had no food or water. By the time the helo got back, the sun had completely set. They radioed down that they only had enough fuel to do a few hoists. I told them of the 11 survivors but that we could do it in three hoists. Somehow, we were able to fit 15 people, including the crew, into the MH-65D helicopter."

Lt. Crowley said the work took him back to his time flying rescues following Hurricane Katrina.

"You never want to see this type of devastation and distress anywhere, but it affects you even more when it happens to your neighbors in a place you've called home for the past three years," said Crowley. "I'm just grateful we were able to help."

PROVIDING HOIST SUPPORT

The U.S. CBP AMO office in Tucson, Arizona, was one of several CBP offices that sent personnel, aircraft and resources to the Houston area to help with relief efforts following Hurricane Harvey. In total, AMO sent 42 different asset types, including 23 helicopters, to help in the response.

Watching the storm system develop over the preceding days, the AMO's Tucson office had a basic plan of action in place to ferry their aircraft across the country if needed when the hurricane hit. It received the order to deploy on Aug. 24.

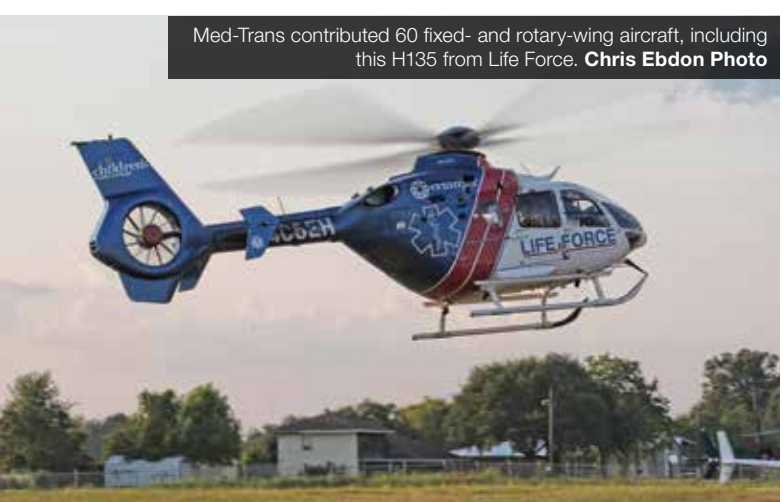
Over the following two days, the office ferried three of its four hoist-equipped UH-60 Black Hawks to Texas.

"One of the biggest challenges for any of these natural disasters is usually where we're going to set up shop initially, because you can't go to too close to the disaster area," Mark Thomas, an air interdiction agent at the Tucson office, told *Vertical.* "Luckily, as an agency, we have several branches across Texas that we could utilize for

An EC135 from Acadian Air Med performs a patient transfer. Louisiana-based Acadian opened its first Texas base in May 2017, in Silsbee. **Chris Ebdon Photo**

Air Methods deployed 20 EMS helicopters and fixed-wing aircraft to Texas, along with nearly 200 flight nurses, paramedics, pilots, and maintenance technicians. **Chris Ebdon Photo**

An AeroCare Bell 407 performs a patient transfer at a staging area in Houston. **Chris Ebdon Photo**



Med-Trans contributed 60 fixed- and rotary-wing aircraft, including this H135 from Life Force. **Chris Ebdon Photo**

maintenance, storage of the aircraft, and logistical things like that."

They initially set up base in San Angelo along with two UH-1Ns from CBP's base in El Paso, Texas, and an AStar from its office in Deming, New Mexico. They then moved to Kelly Field Annex in San Antonio.

The tail end of the storm prevented the aircraft from accessing Houston until Aug. 28, when they were able to reach George Bush Intercontinental Airport.

"I have worked floods, I worked the Haiti earthquake when I was stationed in Puerto Rico with CBP, and we went to Hurricane Matthew last year," said Thomas, "[but] the vastness of this storm and the vastness of area, where so much water was dumped on Houston, made it like nothing I've seen. Even 40 or 50 miles to the west of Houston in the lowlands, farmland was flooded. On day one and two — the Monday and Tuesday — when you had good visibility of more than three or four miles, all you could see is water."

Working in conjunction with the Coast Guard, the CBP began flying to those neighborhoods in most need, using Atlantic Aviation at the airport for fuel.

CBP's Black Hawks had a crew of five: a pilot, a co-pilot, a hoist operator, a rescue specialist, and a swift water rescue technician.

"We would hoist people off the ground that were in chest-deep water, the first floors of their houses were flooded, and we started to relocate those people," said Thomas.

Casualty collection points — known as CCPs — were established throughout the city, and these buildings, from the George R. Brown Convention Center, to schools, churches, and community centers, played host to the evacuees.

The convention center had a capacity of 5,000, and it was filled by the end of the first day of operations on the Monday, thanks to the efforts of the CBP, Coast Guard, and the military.

Alaska and California Air National Guardsmen unload search-and-rescue equipment from a Texas Army National Guard CH-47 Chinook helicopter from the 2-149th General Support Aviation Battalion. **Staff Sgt. Balinda O'Neal Dresel Photo**

La.-Cpl. Keith Reichard, an aerial observer with Detachment A, Marine Light Attack Helicopter Squadron 773, 4th Marine Aircraft Wing, Marine Forces Reserve, guides a family onboard a UH-1Y in Port Arthur, Texas. **Cpl. Kimberly Aguirre Photo**

An Ohio National Guard CH-47 Chinook delivers hay to stranded livestock after Hurricane Harvey flooding near Beaumont, Texas. **Malcolm McClendon Photo**

An MH-65 from USCG Air Station Mobile, Alabama, takes off from a parking lot after picking up a patient. **Chris Ebdon Photo**

Brian Archibald, a rescue specialist assigned to the South Carolina Helicopter Aquatic Rescue Team Delta, is lowered to flood waters in Port Arthur. **Staff Sgt. Daniel Martinez Photo**

The rescues continued over the next two days, filling the various CCPs and moving the CBP's operational focus to Beaumont, a city about 80 miles to the east of Houston that was also battered by the storm.

"These [Beaumont] neighborhoods were literally up to the up to the first story and into the second story full of water, because of the amount of rain they'd had over three days," said Thomas.

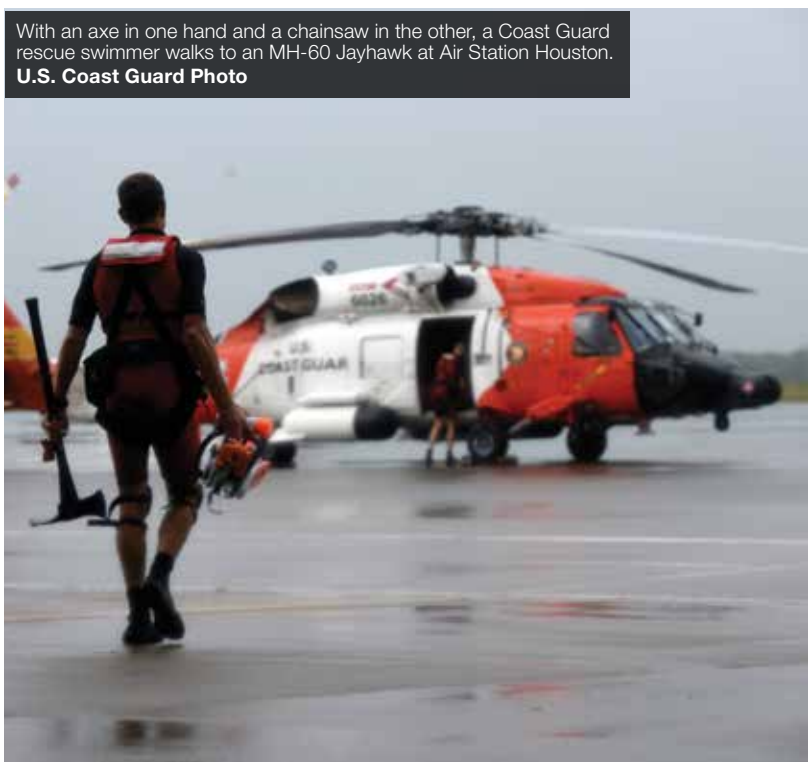
The agency ended up staying in the region until Sept. 8 — almost two full weeks. With the rescues complete after the first few days, the CBP switched missions to help local law enforcement with patrolling duties, as well as helping to move people, equipment, water and food, and relocating patients between hospitals.

All told, the unit recorded 182.5 operational hours on its UH-60s alone, rescuing 515 people — as well as 13 pets.

A HEAVY CIVILIAN PRESENCE

CHI Aviation is no stranger to helping out a community after disaster strikes. The aerial construction expert, based in Howell, Michigan, worked in Louisiana in the aftermath of Hurricanes Katrina and Rita for six months in 2005.

Working for EMS provider Air Methods, it sent a Sikorsky S-61 down to Houston the day after Harvey struck. Following the eight-hour ferry flight from Michigan, CHI's team arrived at their staging area in San Antonio. Their role over the following days would be to move patients out of hospitals affected by the flooding.



With an axe in one hand and a chainsaw in the other, a Coast Guard rescue swimmer walks to an MH-60 Jayhawk at Air Station Houston. **U.S. Coast Guard Photo**

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"They triaged them and we took the patients in the worst condition up to Easterwood [Airport], and then they put those people on airplanes and helicopters and transported them," said Mike Jones, CHI's pilot in command in Houston.

"The first day of flying was pretty bad weather-wise, because I think we were still on the tail end of the storm. So it was low ceilings, but visibility wasn't too bad. There was still a pretty large amount of rain and some winds, and then the airspace continued to get busier and busier."

The CHI crew consisted of two pilots, two mechanics, and another mechanic who served as a mission liaison during the operation.

After a long first day, the team generally flew no more than six-hour days for the rest of their time on the operation as their work switched to bringing in relief nurses and doctors.

Thomas said the size of the S-61 meant access to hospitals wasn't straightforward.

"All these hospital pads are made for BK117s or S-76s as the largest [aircraft] that need to get in, so most of the pads weren't going to work for us," he said. "We had to pick out parking lots that were adjacent to the hospitals and land in them, so it was just choosing where we wanted to land in the safest and most open area."

As more roads opened up to traffic, allowing patient transfer by ground transport, CHI's operations moved to Beaumont, which was heaving with helicopter traffic. There, Jones saw a large military presence, including a CH-53, CH-47s, and some UH-60s.

"When you walked into [the Beaumont] airport's old terminal there, there must have been a hundred guys in different-colored flight suits — EMS guys going every which way, and there were helicopters all over the place," said Jones.

In terms of the challenges of the work, he highlighted the congestion of the airspace.

"There was one time that the air traffic controller got so busy that he said, 'I can't do separation anymore. You guys need to have to your eyeballs outside.' You would try to check in with him or do something, and there was just continuously someone talking on the radio. So it was hard to get a word in edgewise."

A BIG IMPACT WITH SMALL HELICOPTERS

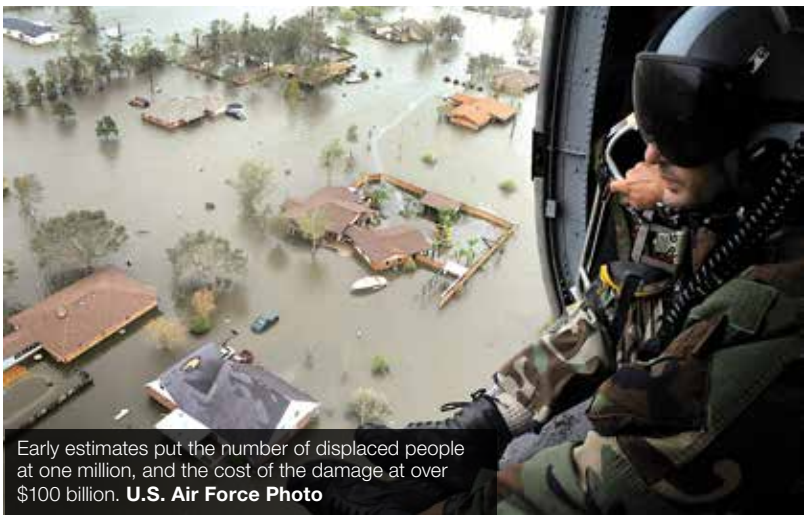
As the path of the storm became clear, Brian Dunaway, president and director of operations at Fort Worth-based Epic Helicopters, made plans to ensure his company would be ready to assist in the aftermath. The operator completed some preemptive maintenance on its fleet, which includes the Robinson R44 and R66; reached out to the Federal Aviation Administration to gain a special operation specification to allow it to operate within the temporary flight restriction (TFR) zone that had been established around Houston; created some online ads to raise awareness of his company's capabilities — such as moving critical personnel and supplies, or providing aerial photos; prepared a landing page on its website that detailed the resources it had available; and made plans to establish an operations center to handle calls for work.

"We had no idea what to expect," Dunaway told *Vertical*. "We decided to bite the bullet and get things done that need to get done so that we were in a fully-prepared state of readiness."

The preparation worked — and once the storm hit, the phone rang nonstop.

"Initially the phone calls we were getting were rescue calls, people asking to be hoisted from the roof, telling us that they had water up their chest — it was really devastating," said Dunaway. "We developed a call script that basically told them, 'We are unable to help — we're not equipped for this type of service. But here is the number

With 44 MH-65s and MH-60s at the heart of its effort, the Coast Guard rescued over 11,000 people following Hurricane Harvey. **U.S. Coast Guard Photo**



Early estimates put the number of displaced people at one million, and the cost of the damage at over $100 billion. **U.S. Air Force Photo**

Soldiers assigned to the 1-143 Infantry Regiment, Airborne Battalion, help transfer a patient to a helicopter at a medical treatment facility in Port Arthur. **Spc. Austin Boucher Photo**

There were 73 helicopters deployed with active-duty units to help those affected by the hurricane. **Staff Sgt. James L. Harper Jr. Photo**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you can call for rescue services.' Once the National Guard was able to get in and start doing some of those rescues, those phone calls died down, and then some of the work that we are more able to address — those calls started coming in."

The first job took an R66 down to Houston to ferry a client from Dallas/Fort Worth International Airport, via the Kelly staging field in San Antonio. An R44 joined it the following day. Over the five days the two aircraft were in the Houston area, they flew a combined 75 hours.

"We were just busy nonstop," said Dunaway. "There were a lot of pipeline inspections at first, and then it turned into a ton of media flights — we flew the *L.A. Times, New York Times, Associated Press, Getty Images, Houston Chronicle*, and a few others."

Like many other operators, Epic ended up in Beaumont. It was there that the company did the majority of its work.

"Beaumont just got hammered — it was completely flooded," said Dunaway. "Nothing was accessible by road. We were moving critical security personnel into the nuclear power plant down there, we moved food into that power plant because the crews didn't have anything to eat . . . and we moved two electricians in to hook up some generators in a nursing home so that they could get some power. It was one job to the next, and a lot of times the guys didn't know where they were going until they landed from the last job."

The work tailed off as the conditions on the ground improved, and the aircraft returned to Fort Worth on Aug. 31.

A NEW PERSPECTIVE

By Aug. 31, the FAA had issued 43 unmanned aircraft system authorizations to drone operators supporting response and recovery operations post-Harvey. The authorizations covered government agencies who conducted damage assessments of critical infrastructure, homes and businesses to help target recovery efforts, as well as eight approvals for a railroad company who wanted to survey damage along a major rail line running through the city. Drones were also used to check for damage by oil and energy companies, and by fire departments to check the condition of major roads, bridges and water treatment plants.

Four media outlets also operated drones over Houston to film footage of the devastation.

Joining these relief efforts was Airbus Aerial. The fledgling company, launched by parent company Airbus in May 2017, fuses data from drones, manned aircraft, and satellites to provide customers with a clear overall picture of a given area.

Following Hurricane Harvey, Airbus Aerial worked to provide insurance companies with images to help quickly identify customers that had been affected by the flooding, allowing them to start the claims process as quickly as possible.

"What we're about is providing a full service where we bring together that ability to capture data, represent the data, and create analysis layers and things like that — so that insurance companies in the state of Texas, for example, can come to us before or after a storm hits and say, 'We really want to know what's going on with our customers in these certain areas,' " said Jesse Kallman, Airbus Aerial president. "We saw what was coming and we knew our system that we have been developing is ready to be used. We offered it to a lot of insurance companies . . . so that they could help their teams quickly, and we got a lot of people very quickly interested in what we were doing."

From the smallest drones to the largest helicopters, aviation assets played a crucial role in the initial response to Hurricane Harvey, helping rescue thousands and maintain crucial infrastructure links that would help the communities of southern Texas get back on their feet and begin the rebuilding process.

Additional reporting for this story was provided by Skip Robinson.

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
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In the Beaumont area, pilots had to contend with poor visibility and numerous wire hazards.
Alexander Zamora Photo

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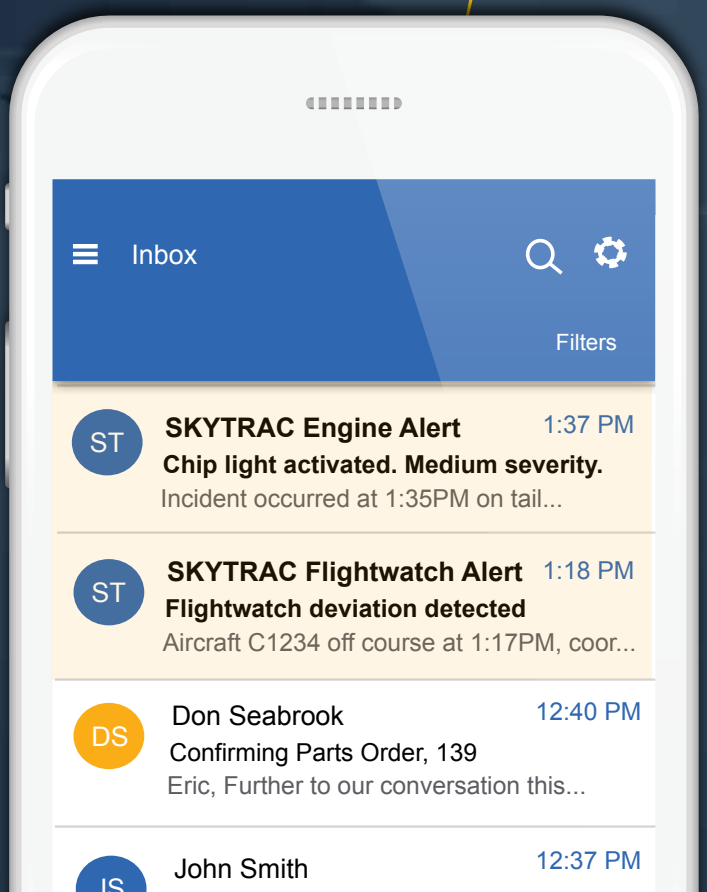

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The U.S. Bureau of Land Management has been transporting firefighters in a restricted category UH-60 Black Hawk — but without issuing a public aircraft declaration. Will the FAA step in to assert oversight?

By Elan Head

On Aug. 5, 2008, a Sikorsky S-61N operated by Carson Helicopters under contract to the U.S. Forest Service (USFS) crashed during takeoff from a helibase near Weaverville, California. At the time of the accident, the aircraft was being used to transport firefighters from "Helispot 44" to another helispot on the Iron Complex fire. Seven firefighters, the pilot-in-command, and a USFS inspector pilot were killed in the crash, which subsequently became known as "Iron 44." Another three firefighters and the co-pilot were seriously injured.

The National Transportation Safety Board (NTSB) led a long and complex investigation into Iron 44, finding, among other things, that the operator had provided the pilot-in-command with an incorrect weight for the empty aircraft, and had also altered the helicopter's takeoff power available charts to eliminate a safety margin. In 2015, former Carson Helicopters vice president Steven Metheny was sentenced by a U.S. District Court judge to over 12 years in prison for his role in falsifying the aircraft's weight-and-balance and performance charts. Levi Phillips, Carson's director of maintenance at the time of the accident, was sentenced to 25 months in prison.

The investigation into Iron 44 raised questions about the oversight of public aircraft operations, in particular those conducted by commercial operators under contract to government agencies. In a 2004 report on the in-flight breakups of three contracted fixed-wing firefighting aircraft, the NTSB had determined that although the Department of Interior (DOI) and the USFS had "attempted to compel safe operations through the use of contract language that required compliance with FAA [Federal Aviation Administration] regulations, their oversight and infrastructure were not adequate to ensure safe operations." In the case of Iron 44, the NTSB concluded that the USFS's oversight remained inadequate, finding that "effective oversight would likely have identified that Carson Helicopters was using improper weight and performance charts for contract bidding and actual load calculations."

Moreover, the NTSB found that the FAA had also missed opportunities to flag the falsified charts. According to the NTSB's report on Iron 44, the FAA inspectors charged with surveilling Carson "consistently asserted that since [Carson Helicopters] primarily operated under contract to the USFS, the FAA was not responsible for the oversight of a majority of the company's operations." But the NTSB pointed out that the accident helicopter had been added to Carson's 14 Code of Federal Regulations (CFR) part 135 operations specifications before going on contract with the USFS, during which time it was unquestionably subject to FAA oversight.

In the aftermath of Iron 44, the USFS and FAA both took steps to strengthen their oversight of contracted firefighting operators, as well as to clarify their respective responsibilities for that oversight. In early 2014, the FAA issued a revised version of Advisory

A QUESTION of PUBLIC USE

A Bureau of Land Management contract for a restricted category UH-60A Black Hawk is at the center of a dispute concerning oversight of contracted firefighting aircraft.
Shawn Evans Photo

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Circular (AC) 00-1.1A, which provides information to assist in determining whether a government-contracted aircraft operation legally qualifies as a public aircraft operation (PAO) — not subject to FAA oversight — or as a civil aircraft operation subject to all applicable FAA regulations. The AC instructs commercial operators who conduct PAOs to obtain a written declaration of public aircraft status from their contracting government entity, and submit that declaration to the appropriate FAA Flight Standards District Office.

"This will serve as notice to the FAA that there is a contract between the civil operator and the government entity that anticipates the conduct of PAO," the AC explains. "Contracted civil operators must be aware that unless there is a declaration of public aircraft status on file with the agency, the FAA considers all operations civil; civil operations must be conducted in accordance with all applicable civil aviation regulations."

This policy, adopted to address deficiencies exposed by Iron 44, is why the specter of that crash hangs over a new firefighting contract for the Bureau of Land Management (BLM), a DOI agency. On June 29, 2017, the BLM awarded a contract worth up to $14 million for the transport of up to 12 firefighters in a restricted category Sikorsky UH-60A Black Hawk. However, the contract raised regulatory questions long before it was awarded — and is raising more urgent questions now that the aircraft is actively transporting firefighters without a declaration of public aircraft status. Will the FAA intervene to enforce civil aircraft regulations, or does the contract signal a return to the ambiguous oversight that was implicated in the tragedy of Iron 44?

DEFINING PUBLIC AIRCRAFT

Generally speaking, a public aircraft is an aircraft operated by or exclusively for a government entity for an approved governmental function (the complete definition is contained in 14 CFR 1.1). Public aircraft are exempt from the regulations that apply specifically to civil aircraft provided they only carry crewmembers, or qualified non-crewmembers "whose presence is required to perform, or is associated with the performance of, a governmental function."

Firefighting is one of the governmental functions explicitly listed in 14 CFR, and firefighters can be considered qualified non-crewmembers in the context of public aircraft operations. That's why the California Department of Forestry and Fire Protection (Cal Fire) can transport fire crews on its fleet of modified, former military Bell "Super Huey" helicopters, which do not have civil type certificates. The state of California necessarily assumes all liability for Cal Fire's operations.

Civil aircraft operators who transport passengers for hire must use aircraft with standard airworthiness certificates and hold an operating certificate in compliance with 14 CFR part 119. Operators who transport USFS firefighters are contractually required to hold air carrier certificates and operate in accordance with part 135, which governs commuter and on-demand operations.

However, the federal government also contracts with some operators for restricted category civil aircraft, which are used for special purpose operations such as water dropping (more formally known as the "aerial dispensing of liquids," or ADL). 14 CFR 91.313 prohibits restricted category aircraft from performing

Timberline Helicopters, which currently operates three restricted category UH-60A Black Hawks, protested the BLM solicitation to the GAO on the grounds that it was defective. However, the GAO denied the protest and two subsequent appeals. **Ammy Jorgenson Photo**

> **IF YOU ARE OFFERED A CONTRACT TO PERFORM OPERATIONS THAT COULD BE CONTRARY TO 14 CFR REGULATIONS . . . IT IS YOUR RESPONSIBILITY TO ENSURE THAT A WRITTEN DECLARATION OF PUBLIC AIRCRAFT STATUS IS ON FILE WITH THE FAA OR TO REFUSE THE CONTRACT.**
>
> ***- FAA ADVISORY CIRCULAR (AC) 00-1.1A***

operations other than the special purpose operations for which they are specifically certificated, and from carrying persons or property for compensation or hire.

The regulation further states that no person may be carried on a restricted category civil aircraft unless that person is a flight crewmember or flight crewmember trainee, "performs an essential function in connection with a special purpose operation for which the aircraft is certificated," or "is necessary to accomplish the work activity directly associated with that special purpose." That's a much stricter limitation than the one for qualified non-crewmembers on public aircraft, who only need to be "associated with the performance of a governmental function."

In January 2017, the BLM issued a request for information (RFI) for "fully contractor operated and maintained exclusive use helicopter flight services" entailing substantially the same requirements as a solicitation it had issued, then cancelled, in 2016. The RFI called for a Type I Heavy (more than 12,500-pound/5,670 kilogram) helicopter with 12 insured personnel seats, a 140-knot cruise speed, and other specifications that pointed toward a particular helicopter model: the Black Hawk.

One of the commercial operators interested in the RFI was Timberline Helicopters of Sandpoint, Idaho, which currently operates three restricted category UH-60A Black Hawks. However, Timberline chief operating officer Travis Storro noted that some operations identified by the BLM — including pre-positioning up to 12 firefighters at a time — could not legally be conducted under 14 CFR, because no version of the Black Hawk holds a standard category type certificate from the FAA.

"As members of the aerial firefighting community, we strongly

Public aircraft operated by government entities are exempt from the regulations that apply specifically to civil aircraft, provided they only carry crewmembers or qualified non-crewmembers.
Skip Robinson Photo

believe in utilizing the available resources to their fullest potential while maintaining compliance with all applicable regulations and safety protocols," Storro wrote in a Jan. 16 response to the RFI. "We would be very willing to contribute to the development of a specification for the federal government to solicit UH-60/S-70 helicopters for helitack and other firefighting related operations."

The BLM did not respond to Storro's letter. In February 2017, it issued a solicitation based on its RFI, explicitly stating that the winning contractor "must operate in accordance with their approved FAA operations specifications and all portions of 14 CFR 91, including those portions applicable to civil aircraft." In response to questions from Timberline, the agency reiterated that "there is no intent to issue a public aircraft declaration, the agency sustains its position that an aircraft which meets the requirements of this solicitation will be able to perform most missions listed under [the] scope of contract."

AC 00-1.1A, the advisory circular that was updated in the wake of Iron 44, is clear on the responsibilities of contracted civil operators: "If you are offered a contract to perform operations that could be contrary to 14 CFR regulations applicable to the operation, it is your responsibility to ensure that a written declaration of public aircraft status is on file with the FAA or to refuse the contract." Because the BLM had stated that it did not intend to issue a public aircraft declaration — which Timberline believed was the only way to legally transport firefighters as specified in the solicitation's scope of services — the company decided to protest the solicitation to the Government Accountability Office (GAO) on the grounds that it was defective.

CONFLICTING INTERPRETATIONS

The GAO issued an initial denial of Timberline's protest on June 27 (subsequently denying two appeals in August and September). The documents provided with its decision revealed that Walker Craig, Technical Services Division chief for the DOI's Office of Aviation Services, had on several occasions sought clarification from the FAA on the legality of carrying firefighters on board a restricted category aircraft — but without specifying the exact operations, such as pre-positioning firefighters, that the BLM intended to perform.

The USFS contractually requires operators who carry firefighters to comply with civil aircraft operating rules. However, the NTSB has noted that certain firefighting missions, such as rappel operations, are not adequately addressed by federal aviation regulations, and require mission-specific standards and oversight.
Skip Robinson Photo

PJ Helicopters of Red Bluff, California, was awarded the BLM's Black Hawk contract, telling *Vertical* in August, "PJ Helicopters is confident in the ability of a federal agency to issue and award a solicitation that is legal and sound in all aspects." **Skip Robinson Photo**

For example, on March 15, 2017, while the solicitation was still open, Craig asked the FAA, "Is an aircraft with a current restricted airworthiness certificate on board which details certification under 14 CFR 21.25 (b) (2. Forest and wildlife conservation) permitted to carry firefighters as a civil operation under 14 CFR 91.313 (d)(3) or (d)(4)?" On April 20, FAA aviation safety inspector John Drago responded "yes," then pointed Craig to the preamble for 91.313 for "the determination of whether these firefighters are 'necessary' or 'essential.' "

The GAO concluded that this consultation was sufficient for supporting the BLM's position, and stated in its ruling, "Our review of the records leads us to conclude that Timberline's understanding of the relevant FAA regulations is erroneous." Two days later, the BLM awarded its contract for a military surplus UH-60A Black Hawk with a restricted category type certificate. In July, the BLM announced the award of the Boise, Idaho-based contract in the form of an interagency briefing paper, which stated that the aircraft would be used for operations including prepositioning in support of wildland fire, and delivery of "mission essential firefighters" to and from wildland fires.

However, when Storro submitted his own, scenario-based questions to the FAA, Drago provided answers at odds with the BLM's declared operations. For example, Storro asked, "Is delivery of firefighters to a fire and recovery of firefighters following deployment to a fire considered 'aerial work' as listed in 14 CFR part 119.1(e) if there is no aerial dispensing of liquid or external load operation that takes place during those missions?"

Drago responded, "No, there is no special purpose operation (ADL). The carriage of these people would be considered transportation subject to part 119 rules."

Timberline wasn't the only operator who had questioned the legality of such operations. In April, the FAA received a request for legal interpretation from Hillcrest Aircraft Company concerning similar scenario-based questions. When the FAA finally answered that request with a memo on Aug. 28, its responses, prepared by Drago, echoed the answers he had provided to Timberline.

The interpretation emphasized, "The determination of which people may be carried on a restricted category civil aircraft is based upon whether they perform an essential function in connection with a special purpose operation for which the aircraft is certificated or they are necessary to accomplish the work activity directly associated with that special purpose. What those people are called or how they are referred to has no bearing on this decision."

Of course, the questions that were posed before the contract was active were purely hypothetical. When the BLM's Boise Helitack crew went available with the Black Hawk on Aug. 19, those questions assumed a more immediate significance.

On Sept. 12, *Vertical* learned that the Black Hawk had been conducting flights with 14 people on board, and asked the BLM whether the agency had issued a public aircraft declaration for those flights. A BLM spokesperson responded, "The aircraft is being operated with a flight crew of two and 12 essential personnel associated with the aircraft's mission. A public aircraft operations declaration is not necessary, therefore one has not been issued."

One week later, the FAA received an eyewitness report that the Black Hawk had been used to transport BLM fire employees to a helibase where they were assigned to crew or manage other helicopters — activities that were clearly not essential to the Black Hawk's aerial work operations. *Vertical* contacted the eyewitness to confirm his statements independently.

The Black Hawk is widely recognized as an exceptionally capable firefighting aircraft. The only reason why it does not have a standard category type certificate is because Sikorsky has not found it worthwhile to pursue one.
Dan Megna Photo

NO CLEAR RESOLUTION

Despite the pertinent oversight issues raised by Iron 44, there are some important differences between the circumstances of that crash and the BLM's current operations, including very different aircraft.

The NTSB determined the probable cause of the accident to be specific actions taken by Carson Helicopters that led to the pilots overestimating the aircraft's load-carrying capacity. (Carson Helicopters disputed this determination, maintaining that the accident had been caused not by inaccurate charts, but by a loss of power in the No. 2 engine due to contamination of the fuel control unit.)

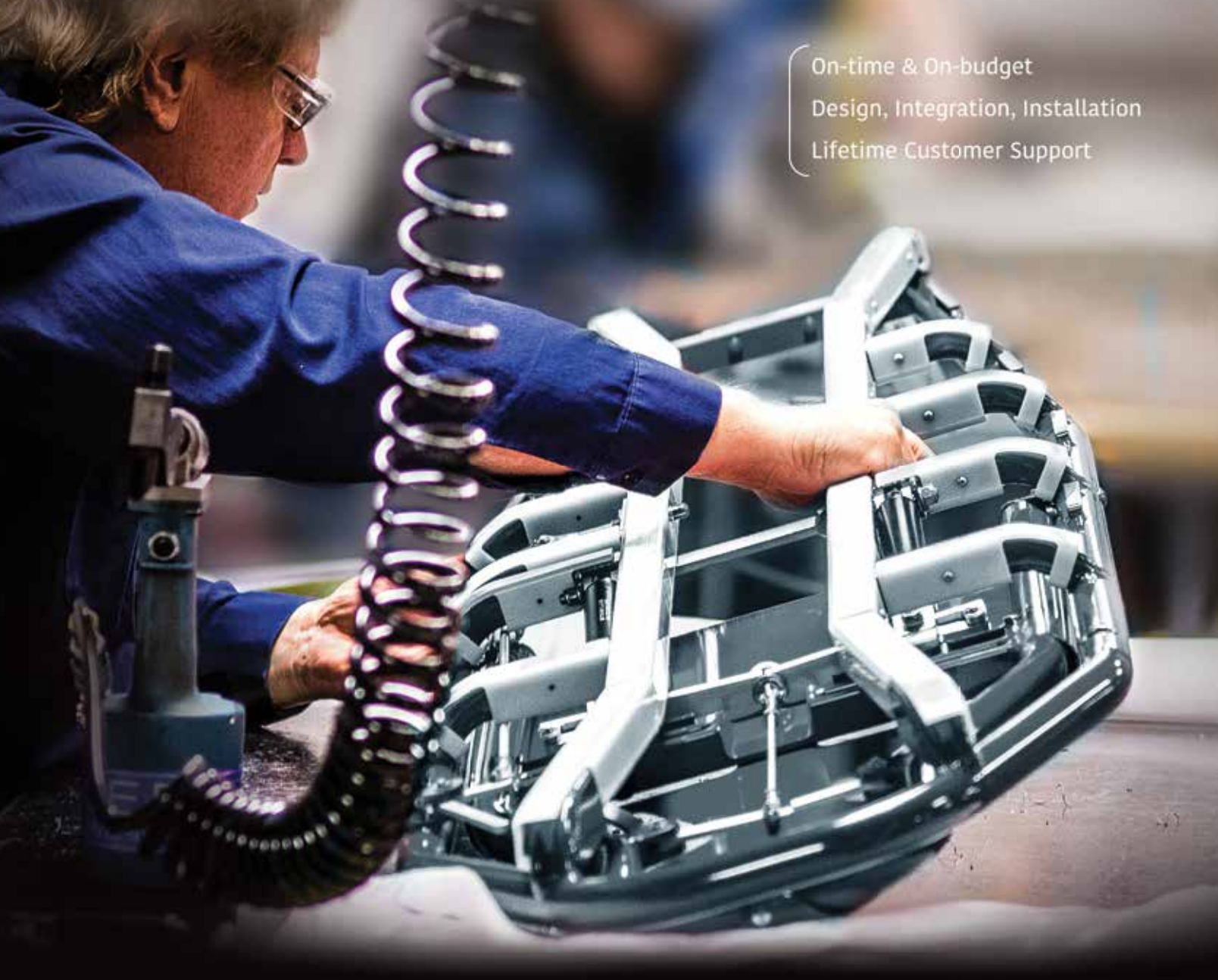
However, the board also highlighted serious concerns with the accident helicopter, an older transport category helicopter that had been manufactured in 1965. The board found that several features of the aircraft had contributed to the high number of fatalities: fuel tanks and seats that were not crash-resistant, and the use of an inappropriate release mechanism on the cabin seat restraints.

By contrast, the Black Hawk is significantly more capable and crash-resistant than many of the older standard category helicopters that are currently being used to transport USFS and DOI firefighters. Indeed, the only reason why the Black Hawk does not have a standard category type certificate is because Sikorsky has not found it worthwhile to pursue one.

"The UH-60 was designed to meet very tough U.S. military airworthiness and combat fitness standards," explained Jeannette Eaton, Sikorsky regional sales director for North America, confirming that Sikorsky has no plans to pursue a full FAA type certificate for the Black Hawk family. "From a high-level viewpoint, military and civil certification standards are fundamentally similar . . . but in detail the FAA and military requirements are quite different, and an aircraft designed and qualified under one system would not be easily accepted under the other."

With its current Black Hawk contract, the BLM appears to be squarely focused on the capabilities of the aircraft, and not on the finer points of its operation. Its July briefing paper on the contract includes a four-page safety assessment and mitigation of features specific to the model, such as the Black Hawk's larger footprint and greater rotor wash. However, the assessment doesn't mention any concerns related to the maintenance, equipment, or pilot training requirements for a restricted category aircraft, which cannot currently be added to the operations specifications of an air carrier certificate.

14 CFR part 135 spells out strict operational and maintenance requirements for aircraft that carry passengers, with particularly stringent requirements for multi-engine aircraft with 10 or more passenger seats. But with restricted category aircraft ineligible for part 135, the standards to which the BLM Black Hawk is being operated and maintained are not as clearly defined as they would be for a part 135



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"The FAA allows transportation of people in restricted category aircraft only if they are essential and necessary for the aerial work portion of the special purpose operation specified," an FAA spokesperson told *Vertical* in September. **Skip Robinson Photo**

transport category aircraft. Meanwhile, the BLM's refusal to issue a public aircraft declaration for the contract suggests that the agency is unwilling to assume safety oversight responsibility, and is counting on the FAA to help assure the safety of its operations — even though at least some of those operations appear to be in violation of FAA operating rules.

Vertical submitted a number of questions about the contract to the BLM in early September, but at press time was still waiting for responses. On Sept. 18, an FAA spokesperson provided the following statement: "The FAA and DOI/BLM are still working to clarify which personnel are 'essential and necessary' for the operation of their restricted category aircraft. The FAA allows transportation of people in restricted category aircraft only if they are essential and necessary for the aerial work portion of the special purpose operation specified — in this case, aerial dispensing of liquid for forest and wildlife conservation."

Storro emphasized to *Vertical* that Timberline has protested the BLM contract not because the company doubts the fitness of the Black Hawk, but because the operations lack legal clarity and defined oversight responsibility from both the FAA and the contracting agency. "Either the rules need to change, or the rules need to be enforced," he said. "Both are the sole responsibility of the FAA."

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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The twin-engine Sikorsky S-76D introduced cutting edge technology, including a quiet tail rotor and improved main rotor blades for reduced acoustic levels. **Mike Reyno Photo**

HIGHWAY IN THE SKY

Despite a general industry downtown, experts predict the global VIP and corporate helicopter fleet will double over the next decade. We take a look at where the sector stands today — and where it might be going.

By Kenneth I. Swartz

These VIP Airbus EC155 and Airbus EC130 flying off the French Riviera both feature a shielded fenestrom tail rotor. **Anthony Pecchi Photo**

The time-saving benefits of flying by business jet are easily lost when the ground portion of the journey is on gridlocked roads. That's one reason why helicopters are becoming increasingly popular for short haul business travel, and why more entrepreneurs are learning to fly a helicopter so they can fly point-to-point between facilities, customers, friends and family.

Business helicopter sales, like corporate jet sales, closely track corporate profits, but the development of aircraft with better speed, performance, safety, ride quality or a smaller noise footprint can stimulate new interest. This point is illustrated in the fact that all recently-certified (or in-development) civil helicopters have won private and business aviation orders.

This includes the medium twin-engine Airbus H175, the light intermediate twin-engine Leonardo AW169, and the short light single-engine Bell 505 — as well as the new generation Airbus H160, Bell 525, and Leonardo AW609 tilt-rotor, which are all still in development.

Business aviation is often touted as a mobility tool, an economic enabler and a game changer. "Business aircraft can make a substantial difference in how a company performs its mission, in many cases making a direct contribution to the drivers of shareholder and enterprise value," concluded a 2009 report by NEXA Advisors for the National Business Aviation Association (NBAA) and the General Aviation Manufacturers Association (GAMA). "Increased mobility is at the core of these gains — satisfying management's need for greater organizational agility, knowledge integration and transaction speed."

While many factors go into determining whether a business aircraft is the optimum tool for a specific mission, one of the most important benefits is derived from the "door-to-door" time savings of flying directly from point of origin to destination.

The MD 900 has proven a popular choice for MD Helicopters' VIP customers. **Kenneth I. Swartz Photo**

DEFINING THE MARKET

The private and business aviation rotorcraft market varies in size, depending on how you count the helicopters used for both business and pleasure.

"We estimate that over a quarter of the 28,152 Western-manufactured turbine-powered helicopters in service in the world today — with five seats or more — is flown for business purposes,"

said Chuck Evans, director of marketing for Bell Helicopter.

"That's about 6,800 turbine-powered aircraft, of which about 73 percent are single-engine and 27 percent twin-engine. About 55 percent of this fleet is concentrated in North America and Europe [3,830 aircraft], 20 percent in Latin America [1,346 aircraft] and 25 percent in the rest of the world [1,630 aircraft]."

According to Airbus Helicopters, there were 103 deliveries of private and business aviation helicopters around the world in 2016, including 82 twin-engine models. The delivery value was the lowest since 2008, but Airbus believes demand has hit bottom and is starting to rebound with 200 deliveries forecast by 2019. In the medium term, Airbus forecasts the private and business aviation helicopter fleet will double in the next 10 years, and triple within 20 years.

About half the 300 twin-engine Bell 429s now in service are used for private or business aviation. **Dan Megna Photo**

"The VIP helicopter markets around the world are very similar in what drives their demand," said Nathalie Previte, vice president of Sikorsky strategy and business development, commercial and international military. "The major differences in the VIP fleet sizes around the world have been driven by varying economic conditions and the state of regional operational infrastructure and regulations."

Sikorsky sees the U.S. VIP segment remaining the strongest in the near term, driven by the current positive economic conditions and an established infrastructure and regulatory environment.

"Latin America and Europe are also seeing an increase in demand, sparked by the introduction of new products," said Previte. "As we look further into the future, it is expected that Asia — China and India, in particular — will continue to have a greater share of deliveries as pent-up demand begins to be filled with infrastructure improvements and a reduction in air space restrictions."

Highlighting regional differences, Manuela Barbarossa, VIP specialist with Leonardo Helicopters said: "Our [VIP] helicopters in Sao Paulo, Brazil, are mostly used for passenger transport operations, whereas in the Northeast United States, they are primarily serving the principles, individual owners, or corporate management."

A PLACE TO LAND

Spend a few hours at the London Heliport at Battersea on the south bank of the River Thames, the Heliport de Paris at Issy-les-Moulineaux on east bank of the River Seine, or at any one of New York City's three downtown heliports (Wall Street, East 34st St. or West 30th St.), and you will see how major corporations utilize twin-engine cabin class instrument flight rules (IFR) helicopters to maximize the productivity of their executives.

The newest member of the AW109 family, this Leonardo GrandNew serves Monaco and the French Riviera. **Anthony Pecchi Photo**

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Sikorsky has seen a lot of success with its S-76 in the VIP market, with more than 130 customers flying the aircraft for this purpose. **Mike Reyno Photo**

On any given business day, dozens of twin-engine helicopters will zip in and out of these downtown business cores, dropping off executives for client meetings, taking them to an airport for a scheduled or business jet flight, or shuttling them between different company offices.

The top end of the VIP market is served by Airbus H155s, Leonardo AW139s and Sikorsky S-76Cs and S-76Ds, with the first corporate Airbus H175s and Leonardo AW169s now appearing on the scene.

All the "cabin class" business helicopters in corporate or charter use are equipped with wheels so they can land at an airport and pull up next to a $60-million business jet or the front door of a fixed-base operator (FBO). The wheels also have a practical purpose, because no aircraft or FBO owner wants to see a skid-equipped helicopter blowing ramp debris while it hover-taxis near an expensive business jet.

The development of new urban heliports in North America and Europe is often a challenge because of regulatory hurdles and local opposition, but there have been some success stories, such as Grandview Aviation's Pier 7 heliport in Baltimore Harbor, the HHI Heliport located two minutes by air from Manhattan in Kearny, New Jersey, and Vertiport Chicago, which opened in 2015 in the Illinois Medical District.

Rohini Heliport, northwest of New Delhi, became India's first corporate heliport when it opened in February 2017, but the development of similar corporate heliports in China is still hampered by government airspace restrictions.

Most corporations buying a business helicopter were previously charter customers. The VIP charter market for helicopters is improving, mirroring the improvements in the VIP fixed-wing charter market, according to Scott Ashton, general manager of Sikorsky subsidiary, Associated Aircraft Group (AAG).

"The improved economy is certainly having a positive impact," he said. "Users of private aviation are also becoming more educated on the benefits of helicopter travel to leverage the full capabilities that helicopters provide."

For example, as some of the traditional U.S. business aviation hubs — like Teterboro Airport in New Jersey — get more congested, owners of business aircraft are staging their jets at more cost-effective and less congested outlying airports, and simply using a helicopter to get to their aircraft.

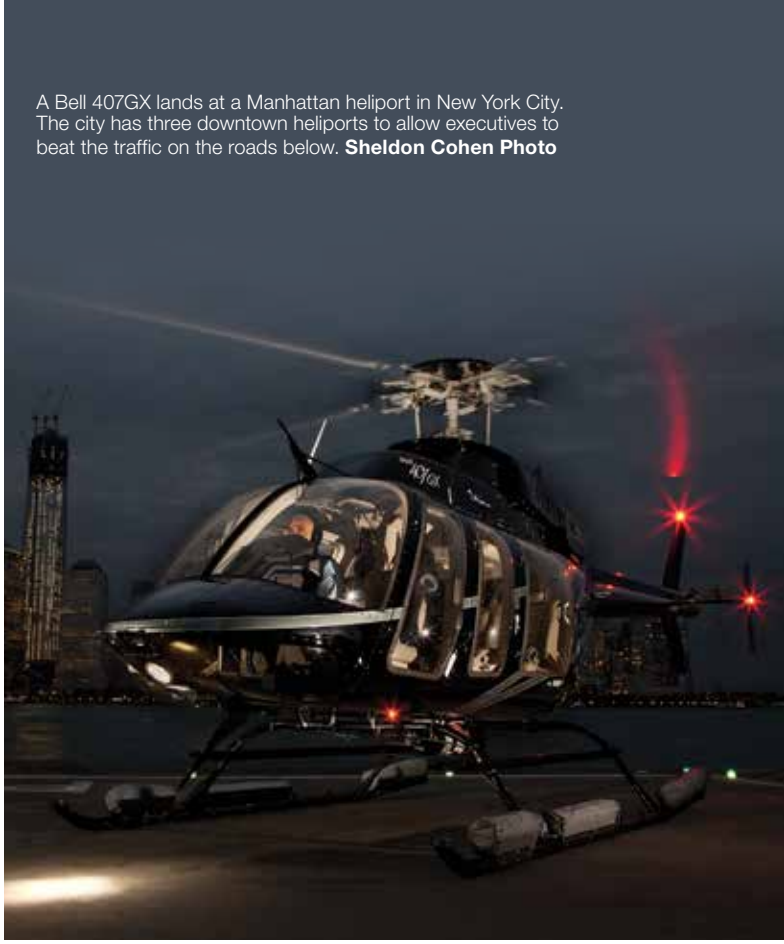
"With the full IFR capabilities of helicopters such as the S-76, we are seeing passengers substitute a helicopter flight for 200- to 300-mile flights instead of using a jet, because of the door-to-door capabilities of the helicopter," said Ashton.

Lower prices for used helicopters have also spurred new owners to buy their own helicopter instead of chartering. For example, the Toronto area is now home to six corporate Sikorsky S-76s (one new S-76D and five S-76C+), up from a single S-76C+ five years ago.

THE MANUFACTURER'S FOCUS

Each year, Bell demonstrates its helicopters at exclusive events like the Monaco Yacht Show in Europe, Fort Lauderdale International Boat Show in Florida, and Monterey Car Week in California to connect with potential customers.

The various OEMs offer some of the finest and most luxurious finishes available for the interior of their VIP aircraft, including the Bell 429 (above) and Leonardo AW169 (below). **Photos courtesy of Bell Helicopter and Leonardo**



A Bell 407GX lands at a Manhattan heliport in New York City. The city has three downtown heliports to allow executives to beat the traffic on the roads below. **Sheldon Cohen Photo**

In the first half of 2017, the first Bell 505s were delivered to entrepreneurs in the U.S. and Canada, and the five-seat aircraft is now offered with an optional high-end luxury MAGnificent interior manufactured by Mecaer Aviation Group (MAG) of Italy. This includes a variety of materials, storage consoles and seating configurations.

About half the 300 Bell 429s now in service are used for private or business aviation, said Bell's Evans, with some customers opting for the optional wheeled landing gear and/or luxurious Mecaer MAGnificent interior.

Bell also expects that the new 525 Relentless will capture a sizable share of the light heavy class corporate and head-of-state market once it is certified. And, given weak demand in the offshore energy sector, the company is putting a lot of effort into winning corporate 525 sales.

Bell has also signed on to be a partner in the development of Uber Elevate's on-demand urban air network, which has a potential requirement for thousands of ultra-quiet electric-powered vertical take-off and landing (eVTOL) aircraft with low operating costs.

Over at Airbus, the manufacturer signaled a renewed focus on the private and business aviation market when it unveiled Airbus Corporate Helicopters,

The first medium twin-engine VVIP Airbus H175 was delivered in 2016 for use on a yacht based in Europe. It features a luxurious seven-passenger cabin by Pegasus Design with two distinct seating areas with facing club seating for four and a galley, and sofa-style seating for three at the rear. **Anthony Pecchi Photo**

a new business aviation sales and service entity, at EBACE 2017 in Geneva, Switzerland, in May.

The previous year, Airbus unveiled the H160 VIP configuration, delivered the first H175 VIP (for super yacht use) and delivered an H145 "Mercedes Benz" model. This year, Airbus delivered the first VIP H135 with an advanced Helionix cockpit, and the second VIP H175 — with many more on order.

Airbus offers new interiors for the VIP H175 and H160 designed by Peder Eidsgaard (Pegasus Design) that focus on design quality and luxury finish, matching those provided in business jets and yachts. Airbus' HCare program (a support and services package) has also been designed to preserve the resale value of its VIP helicopters while keeping maintenance costs low.

"In North America, Airbus's strongest [VIP] market segments are the owner-pilot and yacht community, because of speed and performance," said Josh Myers, head of marketing for Airbus Helicopters, Inc. "The H125 and H130 are the most popular models among VIP owners. The H145 is growing, and when the H160 comes into operation, it will be a popular option for corporate-use."

Last year, most of Airbus's orders in North America came from new Airbus operators or customers new to helicopters. This included VIP orders from five customers who had never owned a helicopter before.

Airbus continues to examine the way urban mobility will shift the market in the future, and a branch of the company based in Silicon Valley is developing new electric-powered vertical takeoff and landing (eVTOL) concepts like CityAirbus and Vahana for this emerging market.

AN ESTABLISHED VIP PRESENCE

When the Agusta A109A first appeared in the U.S. 40 years ago, the twin-engine VIP aircraft was arguably years ahead of its time. Today, Leonardo claims a 50 percent share of the multi-engine VIP/corporate segment with its AW109 series (the latest of which is the GrandNew), AW139 and new AW169.

Concentrations of Leonardo's corporate helicopters can be found around the world, including Brazil (notably Sao Paulo), Australia, the U.K., Southern Europe, and the Northeast United States.

"One sales initiative in particular that has helped us grow the VIP market is . . . 'open architecture' and customization commitment," said Leonardo's Barbarossa. "We can tailor the aircraft interior to fit specific demands and requirements of a customer, so they are not forced into any one interior configuration or layout."

Capable of comfortably hosting up to 10 passengers in its large unobstructed cabin, the AW169 features the latest technology, such as APU mode, advanced dynamic components, an all-electric landing gear, and a touch screen cockpit. Newly designed dampeners inserted between the main rotor blades of the AW169 reduce vibration, giving passengers a comfortable and quiet cabin environment. Additionally, power can be drawn from one of the P&WC PW210 engines while on the ground, without engagement of the rotors, to allow for air conditioning and/or heat for passengers.

"While we remain focused on all markets and regions, we see a number of opportunities in the near term in both Brazil and Southeast Asia, where we recently conducted a demo tour with an AW169," said Barbarossa.

At Sikorsky, the manufacturer has had a long track record of

Capable of comfortably hosting up to 10 passengers in its large unobstructed cabin, the light intermediate Leonardo AW169 is now entering business use with sales especially strong in Brazil. **Leonardo Helicopters Photo**

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providing aircraft for heads of state. In recent times, the S-92 has proven a popular choice, flying 11 nations' heads of state, and in May 2014, Sikorsky won the U.S. Navy contract for the Presidential Helicopter Replacement Program, with the S-92 selected to replace an aging fleet of Sikorsky VH-3s.

Beyond governments, the manufacturer's S-76 has seen a lot of success, with more than 130 customers flying it in a corporate or VIP role.

"We designed the S-76D to be best-in-class with regard to external noise by introducing cutting edge technology, including a quiet tail rotor and improved main rotor blades for reduced acoustic levels," said Sikorsky's Previte. "The helicopter exhibited a very quiet acoustic profile during certification testing — less than 88.7 decibels in flyover — that exceeded our expectation for low noise in flight."

The P&WC PW210S-powered S-76D also features an integrated active vibration control system that allows the helicopter to fly at a maximum long-range cruise speed of 152 knots (175 miles per hour) without an increase in vibration.

Sikorsky is the only major manufacturer that also owns a charter service — Associated Air Group — which serves the Northeastern U.S. with a growing fleet of S-76s. Through AAG, a new Sikorsky program that is a fractional ownership/wholly-owned hybrid is being developed and will be announced at a later date.

THE FUTURE OF URBAN TRAVEL

The business media has given a lot of press to helicopter ride sharing in the past few years, but most of these programs are "really a form of scheduled per-seat charter by a different name," according to Ashton at AAG.

"In order to aggregate demand, the broker or operator simply creates a city pair along with a departure time that passengers can book," he said. "It's very much schedule-driven rather than customer driven. Per-seat charter really requires specific origin/destination pairs that have the passenger density to consistently

The fly-by-wire Model 525 is Bell's largest and most spacious commercial helicopter and features LIVE rotorhub technology for low noise and vibration.
Bell Helicopter Photo

Bell introduced the Bell 429 with wheeled landing gear in 2013, which allows operators the flexibility to ground taxi if needed. **Ned Dawson Photo**

fill seats. Operators need to know there is a demand distribution over time that will allow a reliable load factor to make a profit."

Looking forward, new technologies are being developed to support a more ad-hoc or on-demand means of arranging a shared helicopter flight. In New York and Florida, Blade is expanding its helicopter charter and ride sharing options; Airbus's Voom launched in Sao Paulo, Brazil earlier this year; and Sikorsky Innovations has incubated one company, Evo-Lux, to create applications for self-aggregation of per-seat helicopter charters and also the "AAG Skyshare" app for AAG clients to create ad-hoc per-seat flights.

Uber, the San Francisco-based ride sharing technology firm, has also received a lot of media coverage of its Uber Elevate initiative to develop an on-demand urban air service serving commuters in many cities around the world. In 2020, Uber will launch a flight demonstration program of the concept in the Dallas and Fort Worth area and Dubai using a network of new Vertiports, and in 2023, it plans to start carrying passengers in a fleet of low-cost, extremely quiet eVTOL aircraft.

A helicopter moves at the speed of business, allowing corporate leaders the opportunity to be in more places in less time. And with the growth in number of new urban heliports, more business travelers than ever before are discovering the disruptive benefits of vertical flight.

Kenneth I. Swartz | Ken has spent most of his career in international marketing and PR with commercial aircraft manufacturers, airlines and helicopter charter operators. An award-winning aviation journalist, he runs Aeromedia Communications, and can be reached at kennethswartz@me.com.

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Sky Helicopters' Bell 206L LongRanger holds a hover as the sun sets over some beautiful backcountry near Vancouver, British Columbia.

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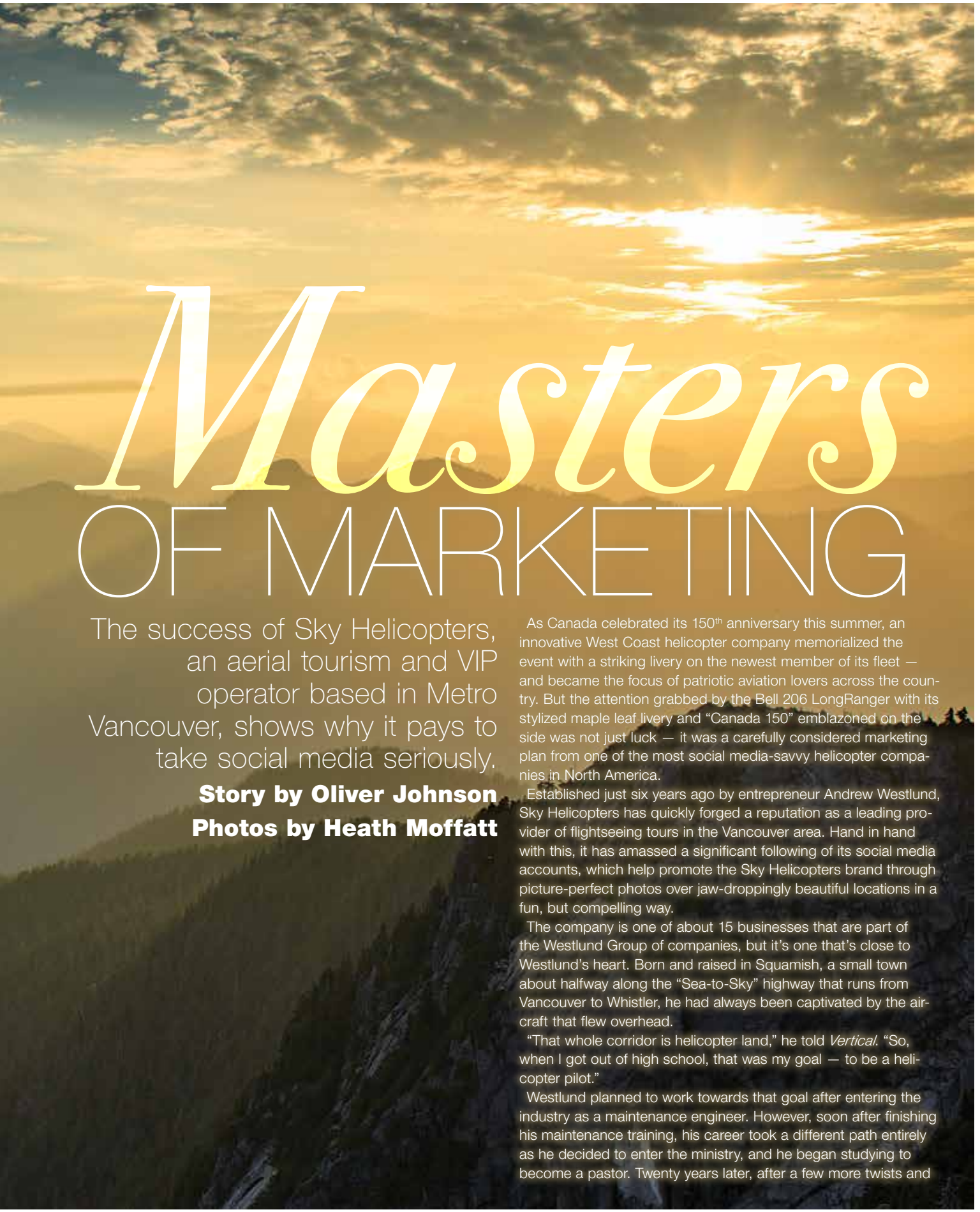

Masters OF MARKETING

The success of Sky Helicopters, an aerial tourism and VIP operator based in Metro Vancouver, shows why it pays to take social media seriously.

Story by Oliver Johnson
Photos by Heath Moffatt

As Canada celebrated its 150th anniversary this summer, an innovative West Coast helicopter company memorialized the event with a striking livery on the newest member of its fleet — and became the focus of patriotic aviation lovers across the country. But the attention grabbed by the Bell 206 LongRanger with its stylized maple leaf livery and "Canada 150" emblazoned on the side was not just luck — it was a carefully considered marketing plan from one of the most social media-savvy helicopter companies in North America.

Established just six years ago by entrepreneur Andrew Westlund, Sky Helicopters has quickly forged a reputation as a leading provider of flightseeing tours in the Vancouver area. Hand in hand with this, it has amassed a significant following of its social media accounts, which help promote the Sky Helicopters brand through picture-perfect photos over jaw-droppingly beautiful locations in a fun, but compelling way.

The company is one of about 15 businesses that are part of the Westlund Group of companies, but it's one that's close to Westlund's heart. Born and raised in Squamish, a small town about halfway along the "Sea-to-Sky" highway that runs from Vancouver to Whistler, he had always been captivated by the aircraft that flew overhead.

"That whole corridor is helicopter land," he told *Vertical*. "So, when I got out of high school, that was my goal — to be a helicopter pilot."

Westlund planned to work towards that goal after entering the industry as a maintenance engineer. However, soon after finishing his maintenance training, his career took a different path entirely as he decided to enter the ministry, and he began studying to become a pastor. Twenty years later, after a few more twists and

Andrew Westlund (far right) established Sky Helicopters six years ago to help transport thought leaders to and from downtown Vancouver. Today, the company has 10 employees and a fleet of six helicopters.

turns in his career, he decided to fulfill his rotary-wing dream.

He gained his private pilot licence with the idea of using a Robinson R44 to travel to and from his cottage by the lake. He then found the aircraft could play a useful role in augmenting his other businesses, helping transport VIPs between Vancouver and the group's base in neighboring Surrey, and providing a boost to the overall brand.

"What I'm trying to do is build a brand around this group of companies, and when there's the helicopter company in the middle of it, it's such a step up," said Westlund. "We're the same as Seattle and a lot of cities with water: our main hub is surrounded by water and therefore bridges, and a lot of people live out in the valley. Speakers and customers don't typically come out to the valley because of the traffic, so we say, 'We'll send a helicopter to pick you up, and you'll be back in your office in less than an hour.' Our whole thought was, 'Let's just make a cool image; let's make money on transporting thought leaders — and also tourism.' "

While Westlund used the high-level image of helicopters to appeal to VIP customers and partners, he aimed to democratize that same image to grow the company's aerial tourism business as a Bell 206 JetRanger, and then another R44, joined the fleet.

"We wanted to bring helicopters into the population," he said. "In a lot of my companies, I say 'It's work, but let's have fun.' We just took that same sort of attitude to the public. We showed up smiling, and it made a difference."

THE POWER OF SOCIAL MEDIA

The company's first couple of holiday seasons saw George Lacny, the group's marketing manager, man a kiosk in local malls where they sold five-minute "takeoff and land" helicopter flights as stocking stuffers. Westlund also took inspiration from the media coverage of a social media giveaway by NBA legend Shaquille O'Neal.

A group of tour passengers is strapped in to the back of the LongRanger. Sky Helicopter offers a range of tour packages suiting a wide range of customer budgets.

The LongRanger's livery celebrates Canada's 150th anniversary. Sky Helicopters had to seek the Canadian government's approval to use the "Canada 150" brand on the aircraft, but received it without hesistation.

"WHAT I'M TRYING TO DO IS BUILD A BRAND AROUND THIS GROUP OF COMPANIES, AND WHEN THERE'S THE HELICOPTER COMPANY IN THE MIDDLE OF IT, IT'S SUCH A STEP UP.

— ANDREW WESTLUND, PRESIDENT OF THE WESTLUND GROUP OF COMPANIES

"[O' Neal] said, 'The first person to high five me on this corner and this corner gets front row seats to tonight's game,' " Westlund recalled. "It was so unique. He had a ton of people come up and it actually made the news that night. So we started working with that."

Instead of courtside seats, five-minute flights were offered through social media to the first people who showed up at certain locations around the region.

"We'd fly the media while we were doing these things, and they were always writing stories about it," said Lacny. "It was a way of getting our brand out there in an advertorial kind of way."

The success of these early ventures quickly persuaded the company about the potential power of social media, and it began taking its presence on Facebook and Instagram extremely seriously — encouraging customers to take photos of themselves and the helicopter in the beautiful locations they visited.

"Social media has helped to essentially grow our business," said Lacny. "So many people are looking for experiences, and they go to social media to find those. You need to be placed there, up front, and show people that helicopters aren't just about flying, they're about creating an incredible experience that they are going to carry away with them for a lifetime. That's what they look for."

The company now has over 15,000 followers on Instagram, and a similar number of likes on Facebook.

"Most folks are reaching out to us through social media — they want the immediate, they want fast, and social media is the way they do that," said Lacny. "Facebook and Instagram — that's where we're collecting a lot of our new customers."

About 75 percent of Sky Helicopters' work is now in aerial tourism. It offers a range of tours, from 15-minute flights over downtown Vancouver, to backcountry tours of the numerous mountains, lakes and rivers surrounding the city, and flights to wineries in the British Columbia interior. It even has engagement and proposal packages.

The company works closely with Tourism Vancouver, and sees two general client bases for its aerial tours: international tourists, and locals who are looking to experience the B.C. backcountry in an entirely new way.

Social media has been a key element in Sky Helicopters' growth, with the company encouraging its passengers to take photos of their experience with the operator and share them online.

"About 80 percent of the flights that we do are the ones that include a mountaintop landing, or landing in the backcountry on our private helipad, then going for a hike to the base of a waterfall and up to a lookout point," said Lacny. "That's what everybody is asking for: they want to do these experiential tours."

The remainder of the company's work is mostly in VIP transport, but it also flies for some film and television productions. Westlund said he doesn't have much interest in chasing utility contracts. "We like our little niche, we like serving our customers, and we're not going to hang it all out there on a few contracts that will come and go," he said. "The other thing is a lot of these contracts are being taken over by drones. We're happy and we're growing; we've grown every year."

MORE THAN JUST A HANGAR

Sky Helicopters operates from a purpose-built 10,000-square-foot hangar at Pitt Meadows Regional Airport.

The immaculate hangar has become a destination in its own right. This is not by chance — it was designed to double as an event and meeting space. It even includes a stage on one side, with a high-end sound system built into it, and has hosted weddings, corporate events, and even the Prime Minister.

The company has a staff of 10, including five pilots. Bryce Westlund, Andrew's son, serves as the company's chief pilot. He said the West Coast weather was probably the biggest challenge the pilots face.

"When you're working with other guys in the industry, they can understand the challenges of weather," he said. "But when you're working with a couple from maybe California or Australia, they may not understand the degree of weather, and then they also don't know the challenges of flying in the mountains and the risks involved with bad weather in the mountains."

Bryce said all Sky Helicopters' pilots are born and raised on the West Coast, so understand the local conditions and the challenges of mountain flying.


The company aims to provide a high quality experience for its customers from the minute they walk in the hangar door, and even offers packages that include pickup in a luxury car.

The company operates out of a 10,000-square-foot hangar at Pitt Meadows Regional Airport that doubles as an events space.

In addition to the LongRanger, Sky has three Robinson R44s and two Bell 206B-3 JetRangers.

The company has a close relationship with Abbotsford, B.C.-based Chinook Helicopters (which completes the maintenance on Sky's fleet), and sources its new pilots from the best of Chinook's latest class of student pilots. Bryce said Sky Helicopters is looking for more from a pilot than just the ability to fly the aircraft.

"In tourism, it's having character and personality," he said. "We're very brand aware, and so a pilot that wants to put on a helmet and work in the bush, not talk to anybody and just fly, that's great, and lot of the industry is that — but for us, it is a little different."

The company has a fleet of six aircraft: three Robinson R44s, two Bell 206B-3 JetRangers, and one Bell 206L LongRanger.

"Mainly we fly the R44, but we are looking into larger aircraft," said operations manager Allan Fraser. "We just acquired the LongRanger this past summer, so we were pretty excited to see how that fits into our fleet and into our business model — and so far, so good. We're loving it."

Bryce said the company was seeing more of a demand for its larger machines. "Instead of flying two or three R44s up to the mountain for one group of tourists, we can fit that in one

All Sky Helicopters' pilots are born and raised on the West Coast, so understand the challenges presented in flying in that part of the world.


The company may upsize its fleet, but believes there will always be a role for the R44.

LongRanger," he said. "We will always have R44s — they're great charter machines, they're great for photography, [and] we're always finding a use for the R44 because of its cost — but I do see us upsizing the fleet pretty quickly."

The LongRanger's patriotic "Canada 150" livery was designed by Devon Regier, creative director of Vinyl Labs (another company in the Westlund Group). Besides looking good, the livery served to promote another Sky Helicopters contest, in which the company gave away $15,000 in $100 gift cards over the summer.

"The Government of Canada has really done a great job of marketing 'Canada 150' around the world," said Lacny. "If people around the world are familiar with [the Canada 150 brand], why wouldn't we want that on our helicopter? Our agency created this really cool-looking wrap for it, we submitted it to the Government of Canada, and they said it was normally a two-week period before they would vet it and agree to it, and we got an email the next day saying, 'Yes, please do it.' Now it's just a showcase; it flies around and people just love it. It's like we're flying Canada."

Establishing such an intimate connection with people is something that appears to be at the core of the company's drive — and its success.

"When all is said and done, I hope we come across as friendly to our customers; and I hope we come across as somewhat innovators, because we haven't chased contracts and raced to zero with pricing," said Andrew Westlund. "We just believe in the brand of helicopters. I don't know if there's anything cooler out there."

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SPREADING ITS WINGS

Bell Helicopter prides itself on being a company of aviation firsts. Now it hopes teaming up with fellow Textron company TRU Simulation + Training will keep it at the forefront of the synthetic world, too.

Story by Jonathan Duke | Photos by Lloyd Horgan

A look at the cockpit inside the Bell 429 full flight simulator located in the new Bell Helicopter Training Academy in Valencia, Spain. The facility opened its doors in February 2017.

Spain's predictably fine weather means it has always been popular with Europeans learning to fly. But Bell Helicopter and TRU Simulation + Training clearly had another motive in mind when they opened their first ever training center outside of the U.S. in the Mediterranean port city of Valencia in February 2017 — given that the majority of flights completed there are within the climate-controlled confines of a full flight simulator.

The center — known as the Bell Helicopter Training Academy (BTA) — offers initial type and recurrent training exclusively on the Bell 429 Global Ranger. It contains the world's first Level D 429 full flight simulator, certified by both the European Aviation Safety Agency (EASA) and Federal Aviation Administration (FAA).

Proving particularly popular in the corporate and emergency medical services (EMS) roles, the 429 has seen robust sales performance in Europe, which has not been particularly fertile ground for the American manufacturer in the past. For a company proud of its ethos of strong customer support, the facility will add a vital link to European operators, who were previously supported through a network of Bell's instrument rating instructors and service centers.

As well as meeting its criteria for customer support, Bell no doubt intends for the academy to play a part in consolidating its position in Europe; it is likely no coincidence that two of its rivals are headquartered in neighboring countries. But the center's influence will reach far beyond European borders. Given the 429's popularity in the Middle East and Africa, and with more than 65 currently operating throughout Latin America, Spain occupies a strategically central position between these markets, as well as linguistic ties to much of South America (the academy's nine staff also speak English, French and Italian between them).

"The center staffing includes fully-qualified Bell 429 TRIs [type rating instructors] to deliver EASA training and TREs [type rating examiners]," Vance Ontjes, the BTA Valencia training center manager, told *Vertical.* "We have received approvals from Argentina, Mexico, and India to conduct training for pilots licensed in these countries. We expect further approvals from Brazil and Russia soon and will continue to add approvals as we see the need."

BUILDING A MOTHERSHIP

The 100,000-square-foot (over 9,000-square-meter) building houses the simulator hall as well as offices, classrooms and breakout space, with plenty of room left to expand. In its first six months, the academy trained 35 pilots, and has the capacity to train around 300 annually. While it's co-located with an existing Textron facility (a Cessna Citation service center), as yet, no Bell Helicopter maintenance or technical training is carried out at the academy.

To meet its customers' training requirements, Bell has adopted TRU Simulation + Training's Odyssey H platform — a helicopter-specific full flight simulator. The Odyssey H has been designed from its inception to replicate rotary-wing flight, incorporating projection and motion systems designed to produce highly realistic visual and tactile situational cues to the pilot.

The center is co-located with a Cessna service center. Spanning 100,000 square feet, the building houses a simulator hall, offices, classrooms and breakout space, but has plenty of room left to expand.

The Bell 429 has been a noteworthy success for Bell in Europe, proving popular with emergency medical services (EMS) operators across the continent.

The Bell 429 full flight simulator uses TRU Simulation + Training's Odyssey H platform and has been certified at Level D by the FAA and EASA.

The graphical element is comprised of 10 Barco projectors configured by RSi Visual Systems to produce a collimated, 240-degree horizontal and 80-degree vertical field of view, with an additional projector providing the chin window display. This provides a main display in ultra high definition reaching 41 megapixels — unparalleled among commercial systems and highly immersive; it is possible to represent the movement of individual blades of grass and produce an unnervingly accurate impression of sea swell and waves. Similar detail has been applied to the motion engine, which incorporates two separate motion systems, each with six degrees of freedom and utilizing electric drive systems.

TRU refers to its simulator module as "the mothership," with the main display and motion platform simply playing host to a completely modular crew area assembly. The simulator is capable of accepting cockpit modules from light to heavy helicopters, representing various aircraft manufacturers. The disconnection of two major cockpit assemblies allows them to be literally rolled out of the simulator platform, and replaced by those of entirely different aircraft. The whole process can be carried out without specialist off-site support, and it takes a matter of hours to return the simulator to service.

However, this is not the only innovation. "The simulator IOS [instructor operator station] was designed to resemble modern user interfaces using two large and convenient touch monitors," said Ontjes. "The menu structure was developed with the instructor in mind to make setup quick and easy, and an iPad gives the instructor the ability to control the entire system wirelessly from anywhere in the simulator."

TRAINING FOR THE WORST CASE SCENARIO

Although EASA requires two hours of flight training in the actual aircraft, as well as a skill test, the majority of the initial type rating course at BTA Valencia is conducted in the TRU simulator and is a 10-day course that includes 24 flying hours. Bell also offers recurrent training as well as a dry-lease, which it says is aimed at reducing aircraft maintenance and fixed costs, as well as giving the customer more control over their schedule.

The type rating course includes elements that would be too difficult or risky to offer in a live environment with any degree of realism. Among these is the inadvertent entry into instrument meteorological conditions (IIMC) element, which simulates an unplanned and unbriefed entry into poor weather conditions. Failing to recognize when such a situation is imminent, or even failing to accept it when it happens, can leave pilots in an extremely hazardous flight condition, with a commensurate sudden increase in workload. The benefits gained from exposure to these conditions in a simulator depend on the fidelity of the system to accurately recreate the visual and motion cues that accompany such an event. Experiencing a high degree of disorientation is an excellent learning process, and is essential to developing avoidance and recovery techniques. It is one element of the course that is type-agnostic, and pilots are likely to benefit from it in whatever aircraft they fly in the future.

Ontjes said that customers have been particularly positive about this element of the training program. "The verbal feedback we have received has been very good," he said.

The center offers initial type and recurrent training exclusively on the Bell 429. The initial type rating course lasts 10 days, and includes 24 flying hours.

The academy trained 35 pilots in its first six months of operation, but has the capacity to train around 300 annually.

"The simulator has some great inadvertent IMC scenarios that require critical decision making by the pilot to safely handle the situation, and the motion system is incredible in giving pilots the appropriate sensations allowing them to fly and react to situations as they would in the real aircraft. Pilots are impressed with the almost endless scenarios we can execute."

The Bell 429's appeal is strong in Europe, and with countries such as Slovakia now expressing an interest in militarizing the type, Bell Helicopter and TRU have been shrewd in the positioning of the BTA. Having planted its flag in the heart of Europe, and with a good and growing customer base on its periphery, it will be interesting to see whether the American company is able to stage a resurgence on the continent.

The realism of the 429 simulator is very impressive, and Bell has capitalized on that strength to deliver the reduced training costs that naturally follow the adoption of synthetic training programs. However, the real potential of that fidelity is fulfilled in using it to improve safety operating in meteorological conditions that will be familiar to many medium twin pilots, particularly in the core 429 target roles of EMS and corporate. And that can never be a bad thing.

Jon Duke & Lloyd Horgan | Vortex Aeromedia provides specialist media services for the aviation, defense, and aerospace sector. Formed in 2015 by photographer Lloyd Horgan and helicopter pilot Jonathan Duke, Vortex Aeromedia draws on their unique blend of military aviation and media experience to deliver high-impact film, photography, and writing specifically to the defense and aerospace industry. They have flown with, photographed, and filmed for a variety of international military and civilian clients. For more information visit www.VortexAeromedia.com.

FARMING THE WIND

The growing use of wind as a source of renewable energy means an increasing number of turbines reaching into the skies. This presents a number of opportunities — and concerns — for those in the rotary-wing world.

By Ed Brotak

The first offshore wind farm was built off the coast of Denmark in 1991. The use of wind turbines as a source of energy has climbed slowly, but steadily, around the world.
Øystein Svendsen/Tom A. Østrem Photo

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The process of using the wind to generate electricity has been around for over a hundred years. For a long time, wind turbines just provided power on a local scale, but with the shortage of oil and the resultant steep price rises of the 1970s, alternate and renewable energy sources were sought out — and wind power on a large scale became a viable option. Although we've seen oil supplies and oil prices rise and fall since, wind farms — a collection of co-located wind turbines — have become commonplace around the world. In the U.S., progress on wind energy has been slow but steady.

The location of wind farms depends on a number of factors. Most important is whether there is a consistent wind flow of sufficient velocity to generate significant amounts of electricity. There is also a general desire to locate wind farms away from densely populated areas.

The first offshore wind farm was built off the coast of Denmark in 1991. With the need to secure these turbines to the ocean floor, offshore wind farms tend to be close to the coast in shallower water. In the future, floating turbines may greatly expand the offshore component of the industry.

The boom in wind energy has provided a new area of growth for the helicopter industry as other sectors of the energy field have faltered. But while the growth of work to support this flourishing sector has been welcome, wind farms also present a few aviation safety issues that should be understood.

STRUCTURE CONCERNS

There are two structures that wind energy companies erect that can pose a physical threat to low flying aircraft. In the "prospecting phase," companies will install meteorological evaluation towers (METs), which contain wind measuring equipment. These towers are typically made from galvanized tubing, with a diameter of six to eight inches, and can be over 200 feet (60 meters) tall. They can be installed quickly — sometimes within hours — and are typically slender and can be difficult to see without markings or lightning. The supporting guy wires can be even less visible.

In the U.S., there isn't a requirement for towers under 200 feet above ground level to be visibly marked or registered if not in the vicinity of an airfield. Companies could install towers just under 200 feet in height to conceal their location from competitors — but also, unfortunately, from aviators. There have been several fatal accidents involving MET towers in the U.S., with the most recent being in 2016. Although all of these involved fixed-wing aircraft, four of them were engaged in agricultural applications — a task often completed by helicopters.

To address this problem, the Federal Aviation Administration (FAA) issued Advisory Circular AC 70 7460-1L on Oct. 8, 2016, which outlined steps to clearly mark/light METs and their supporting guy wires. However, the steps remain just recommendations for towers under 200 feet.

Despite this, there have been a number of states that have passed regulations requiring these towers to be marked and registered, and other states have proposed similar legislation. To help pilots learn about the location of these potential hazards, the FAA keeps an online database — the Digital Obstacle File —

While wind turbines can present some obvious dangers to aviation, they also offer a great opportunity for helicopter operators to pursue work in constructing and servicing them. **Paul Langrock Photo**

which includes registered METs. Some states also have lists of MET locations available online.

In Canada, Transport Canada requires towers over 194 feet (59 meters) to be painted with a highly visible striped pattern and their supporting guy wires to have high visibility sleeves or marker balls. As in the U.S., these are only recommendations for those towers that are under 60 meters in height.

BUILDING A TURBINE

Once a potential wind farm site has been selected, the power generating wind turbines themselves will be erected. These are massive structures, often rising over 500 feet (150 meters) with the current record holder standing at 722 feet (220 meters). Future turbines promise to be even taller. Obviously, these represent a hazard for any low flying aircraft.

With the rapid expansion of the wind energy industry, the FAA has implemented specific regulations for wind farms. Companies must go through a certification process that starts with the planning phase of the project. All proposals for wind turbines or METs must be sent to the FAA's Obstruction Evaluation Group, preferably at least 90 to 120 days before the planned construction of the tower. The group requires the exact location and height of each wind turbine, and after a thorough examination of the proposal, it will make a final determination. If the group sees no problems, a "No Hazard to Navigation" decision will be issued and construction can go ahead. If there are problems with the proposal, the construction company will be told the steps they need to take to receive clearance.

Transport Canada requires an Aeronautical Assessment Form for Obstacle Evaluation to be submitted by the proposing company, preferably as soon as a site is chosen. Any affected aerodome will be considered in the evaluation. In Europe, Eurocontrol offers guidance to its constituent members in these regards.

The FAA has long had marking and lighting requirements for large structures. These were updated in 2016 with very specific requirements for wind turbines. Transport Canada has similar requirements. The result is that under

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normal conditions, wind turbines are easily visible and avoidable. But if there are lighting issues at night, or if visibility is restricted, especially with instrument meteorological conditions, then the threat of collision increases.

The FAA's (and other regulatory agencies') emphasis has been on airports and surrounding areas, places where fixed-wing aircraft would typically be at lower levels. Away from built-up areas or airports, the standard lowest flight level is 500 feet for fixed-wing aircraft (with permitted exceptions). Helicopters, of course, are allowed to fly below this. Thus, with unrestricted wind farms, helicopter air space may be occupied by large wind turbines. To help in these situations, the FAA has an online database including existing and planned wind farms. The Digital Obstacle File described earlier also includes wind turbines. In addition, a number of states have lists of wind farms, and other countries typically have this information available, too.

IMPACTING RADAR

Another concern to aviators is that a collection of wind turbines can cause problems with radar signals, significantly degrading radar performance. For weather radar, there are two specific situations noted. One is that the turbine itself shows up on the radar display — a non-weather-related "false echo." And second, the turbine could block the radar signal and "hide" true precipitation behind it, including thunderstorms. There are similar concerns about air traffic control radar in terms of false targets and the hiding of real targets.

To mitigate some of these potential problems in the U.S., the National Oceanic and Atmospheric Administration's Radar Operations Center has modeled each site using a standard wind turbine blade-tip height of 160 meters and determined potential negative effects on radar performance. It determined four zones of impact, from significant negative impact to unlikely significant impact. Using this, potential wind energy companies are advised where they are prohibited from building, where they can build but with restrictions, and where they are free to build unrestricted.

In Canada, both Nav Canada (with air traffic control radars) and Environment

Some turbines are massive structures, rising over 500 feet (150 meters). The current record holder stands at 722 feet (220 meters) tall.

A collection of wind turbines can interfere with radar signals, creating false echoes indicating weather patterns where there are none, or blocking the appearance of true precipitation.

Canada (weather radars) are involved with approvals for proposed wind farms. In Europe, Eurocontrol also designates four zones, ranging from unacceptable degradation of radar performance to no significant effect on radar performance, with accompanying restrictions and/or requirements on planned wind turbines. For sites where there are already problems, the development of hardware and software mitigation measures can be applied to existing radar sets. In the future, such measures may be already incorporated into the new radar systems. Helicopter operations away from airports may just have to deal with radar issues. This would be true if using ground-based radar data or if the helicopter is equipped with its own radar.

Finally, as one would imagine with structures this large, wind turbines can affect the ambient wind flow. There have been a number of studies to explore the effect, combining fluid dynamics theory with actual observations. Large turbines will certainly slow the wind, known as velocity deficit. They will also produce wake turbulence for some distance behind them. Early research indicates this can be as much as five times the diameter of the rotor. It has also been noted that smaller aircraft, such as helicopters, may be affected by these disturbances in the airflow.

With over 90 countries around the world engaged in “wind mining” and many new wind farms in the planning stage, this will be a field of many opportunities and challenges for the helicopter industry.

Ed Brotak | Ed Brotak, Ph.D., is a retired professor of atmospheric sciences at the University of North Carolina, Asheville. His specialties include weather effects on aviation, marine operations, and ground transportation.

WALKING THROUGH HISTORY

The American Helicopter Museum and Education Center in West Chester, Pennsylvania, offers visitors a rare chance to walk through helicopter history, with dozens of aircraft on display.

Story & Photos by Skip Robinson

Since it first opened its doors to the public on Oct. 18, 1996, the American Helicopter Museum and Education Center (AHMEC) in West Chester, Pennsylvania, has welcomed over half a million visitors of all ages and nationalities.

AHMEC's mission is simple: to preserve and promote rotary-wing aviation history, educate adults and children about helicopters and the missions they perform, and inspire future generations of helicopter enthusiasts.

"Education is a key part of our mission; we want to inspire future generations to become engineers, pilots, crew members and mechanics in the world of vertical flight," Marc Sheffler, chairman of the board of trustees for the museum, told *Vertical*. "With electric

The American Helicopter Museum and Education Center has quite a collection of historic rotary-wing aircraft, include the Boeing Model 360, and its predecessor, the Vertol CH-21 Shawnee.

aircraft on the forefront and unmanned vehicles, these are exciting times for the industry."

The museum's origins can be traced back to 1993, said Sheffler. "Spurred by the Philadelphia chapter of the American Helicopter Society, a number of pioneers of rotary-wing aviation and industry leaders gathered to discuss how to celebrate the 50th anniversary of the American Helicopter Society, and recognize the Delaware Valley as the cradle of rotary-wing aviation in the United States," he said.

Peter Wright, president of Keystone Helicopters and a veteran of the famed Flying Tigers of the Second World War, was the driving force behind the idea of creating an all-helicopter museum. He solidified the concept by offering to donate several vintage helicopters. Two years of meetings followed to put in place the logistics, locate a site and raise funds to launch the museum. The first officers were Peter Wright (president), Robert Beggs (vice president) and Robert (Treb) Lipton (secretary and legal counsel).

The charter team selected a vacant hanger at Brandywine Airport, formerly a manufacturing facility for MBB, as the location for the museum. A large number of historically-significant helicopter developments took place within a 50-mile radius of the museum in the Delaware Valley. Today, four major helicopter companies have facilities in the region, including Boeing, Sikorsky, Leonardo, and Piasecki Aircraft.

A VARIED DISPLAY

The museum's collection has grown over the years, and today provides a great overview of historic helicopters and other rotorcraft. Among the notable aircraft on display is the third prototype Bell-Boeing V-22 Osprey tiltrotor, which is on permanent loan from the National Museum of the Marine Corps. Updated versions of this revolutionary aircraft are now fully operational with the Marines and proving themselves every day. "We are proud to be the only museum in the world to have a V-22 on display, and are thrilled people can see our aircraft up close and climb inside," said Sheffler.

Recent airframe acquisitions include a classic Marine Corps helicopter — a piston-powered Sikorsky UH-34D Seahorse that did many years of yeoman's work in the Vietnam War and around the world, and was donated by the National Air and Space Museum. This particular aircraft is in superb physical condition, and represents a significant part of early Marines Corps helicopter history, as it was the first Marine helicopter able to lift 12 battle-equipped Marines in most environmental conditions.

In 2015, another significant and long-lived Marine helicopter was acquired by the museum — a tandem-rotor Boeing Vertol CH-46E Sea Knight, once operated by Marines Squadron HMMT-164. The CH-46E was the direct replacement for the CH-34D.

The museum also contains a truly unique aircraft in the form of the world's only tandem-rotor Boeing Model 360 in existence. The aircraft is found outside the museum's entrance. It was designed with high-strength, lightweight composite materials that make up almost all of the airframe's structure and many dynamic components. It was built as a technology demonstrator and fell just a few knots short of setting the world speed record.

Boeing also donated the mock-up of the HH-47 Chinook-based combat search-and-rescue helicopter entry that was part of a canceled U.S. Air Force (USAF) competition. This interesting machine gives visitors a chance to see what a Chinook looks like on the inside, and is a very popular walk-through exhibit.

There are two more tandem-rotor helicopters in the museum: the 1950s piston-powered Piasecki HUP-2 and the Piasecki H-21. Both were used as rescue aircraft; the former by the U.S. Navy, and the latter by the USAF in the Arctic and as a troop transport by the U.S. Army in the early years of the Vietnam War.

The museum's collection also includes a Bell AH-1F Cobra attack

Another classic tandem at the museum is the U.S. Marine Corps.' Boeing Vertol CH-46E "Phrog." Hanging from the roof is an Enstrom F-28.

In the restoration shop is a Sikorsky R-6 , a rare and interesting helicopter with an enclosed cabin.

A Hughes/MD AH-6J "Little Bird" from the U.S. Army 160th SOAR "Night Stalkers" is on display. The aircraft took part in numerous fascinating missions during its service, and later appeared in the movie "Black Hawk Down."

The museum is well laid out and has enough space for people to get a good look at the exhibits.

The Boeing HH-47 prototype for the cancelled USAF Combat Search and Rescue program was acquired by the museum.

helicopter and a Bell UH-1L "Huey" U.S. Navy trainer. Both are well known, and are crowd favorites in the museum.

Another popular helicopter with a lot of history is the U.S. Army 160th Special Operations Aviation Regiment's Hughes/MD AH-6J. This light, but potent, helicopter is best known as the "Little Bird," and was used in Operation Just Cause in 1989, as well as featured in the movie *Black Hawk Down*. Other Hughes helicopters on display include a Model 369 /OH-6A and the classic Model 269A/TH-55 trainer.

Beside the Boeing 360 on the outside of the museum are examples of the Sikorsky HH-3A/S-61 Navy combat search-and-rescue helicopter, a U.S. Navy Kaman SH-2F Seasprite anti-submarine helicopter, and a Sikorsky HH-52A Sea Guardian helicopter once operated by the U.S. Coast Guard for search-and-rescue missions. Other Sikorsky helicopters include an S-51/R-5 and an S-52/HO5S.

A French Sud-Ouest SO-1221 Djinn, featuring a unique "cold jet" propulsion system, is also on display, and represents European helicopter history in the museum.

On the purely civilian side, there is an Enstrom F-28, early RotorWay Scorpions, and an early, but very significant, Robinson R-22 — the design that brought helicopter flight to the masses.

The museum also displays a destroyer-based 1964 US Navy Gyrodyne QH-50C anti submarine drone helicopter, carrying two torpedoes. This early drone had electronic reliability issues, but proved the drone attack concept to the U.S. Navy.

Elsewhere, there is a Korean War MASH exhibit, which has a medevac Bell 47D-1/H-13D as its focal point. The museum also has an early B-model Bell 47 on display, which happens to be the third of 43 manufactured. The aircraft is a fine example of the type and is in original condition. Another Bell 47 — an executive H model — helps illustrate the significance of the Bell 47 series to helicopter history. Today, hundreds of Bell 47s still work for a living, primarily in the agricultural industry, but they are also flown by private owners across world.

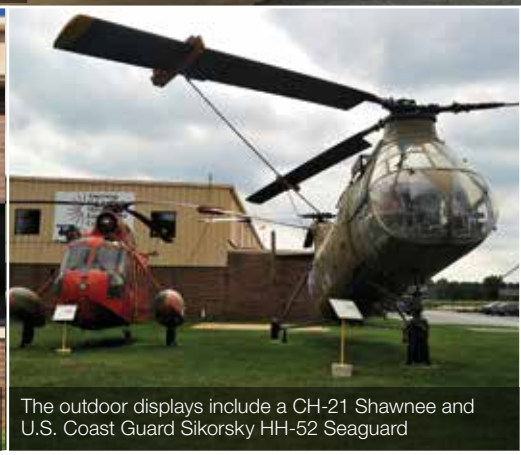
The museum is very proud of its rare 1957 Bensen B-7W hydro-gyroglider, and several gyrocopters such as the Bensen gyrocopter B-8M and Parsons Super Mac II that enhance its offering on this side of the rotary-wing world.

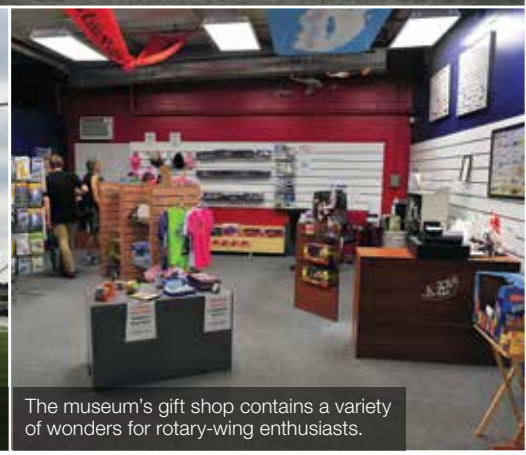
TAKING THE MUSEUM INTO THE FUTURE

"Expanding the museum's collection will always remain a priority," Sheffler told *Vertical*. And as such, the number of aircraft on display

The third prototype of the Boeing- Bell V-22 Osprey.

The museum's library and archives have grown to include almost 18,000 items,


The outdoor displays include a CH-21 Shawnee and U.S. Coast Guard Sikorsky HH-52 Seaguard


The museum's gift shop contains a variety of wonders for rotary-wing enthusiasts.

"WE ARE ALWAYS LOOKING FOR DONATIONS OF HISTORICALLY SIGNIFICANT ITEMS, SO FOLKS SHOULD CONTACT US BEFORE THROWING THINGS AWAY."

- MARC SHEFFLER, AHMEC CHAIRMAN OF THE BOARD OF TRUSTEES

continues to grow. A rare 1944 Sikorsky R-6 is currently being restored and will then become the oldest helicopter on display. Delivered to the Royal Air Force (RAF) as the Hoverfly II, production was shared by Sikorsky and Nash-Kelvinator in Detroit. The next planned restoration is a Piasecki HRP-1. According to Sheffler, a future dream addition would be one of the Pitcairn autogyros, to help show the earliest stages of rotary-wing flight.

In addition to the rotorcraft on display, there are a number of special exhibits. Lee Douglas Pioneer Hall features interactive displays on the founders of the helicopter industry such as Igor Sikorsky, Frank Piasecki, Arthur Young, Harold Pitcairn and Stanley Hiller. Alongside is an exhibit on the AeroVelo Atlas, which won AHS International's Igor I. Sikorsky Human Powered

Helicopter Competition in 2013. One quarter of this amazing vehicle hangs above the exhibit. The Cradle of Rotary Wing Aviation Exhibit tells the story of why AHMEC is well placed in the Delaware Valley, and other displays include different types of anti-torque concepts and an exhibit on the evolution of rotor blade manufacturing.

The museum is very proud of its research library and archives that have grown to almost 18,000 items, including original papers, manuals and one-of-a-kind historical artifacts. Two of the most treasured items in the library are the slide rules of pioneers Juan De La Cierva and Igor Sikorsky. "We are always looking for donations of historically significant items, so folks should contact us before throwing things away," said Sheffler. "For example, we just received a generous contribution of material from Jeff Fucigna, whose late father, Warren, was president of New York Airways."

In 2003, the museum leadership began looking at a transformation of the museum to add exhibit space and update the facility through a series of modernizations and upgrades. The first phase is now complete, consisting of a new state-of-the-art theater, more exhibit space, additional classrooms, a larger restoration area, a new children's early education room, and renovations to the lobby area. To help finance such plans, the museum makes itself available for rental for corporate functions, weddings, birthday parties and other public and private events.

Education is a major component of the museum's mission. Its signature program is Girls in Science and Technology, which pairs girls in third grade through high school with college mentors, and takes them through a series of STEM-related courses. Today, local vocational high schools include a blade design course taught by volunteers from the AHMEC. A key part of the museum's strategic plan is expanding the number of students who benefit from the STEM courses.

The museum's mascot — "Stubby" — is a Hughes 269 traveling ambassador that participates in community events throughout the Delaware Valley. Stubby's blades were cut down for easier truck transport, and he is a hit with kids (and parents) wherever he travels. Children are allowed to climb around Stubby and are taught about how a helicopter works.

The museum plans to continue its growth over the coming years. With sufficient funding, it ultimately hopes to take over the entire building for displays, and it wants to continue adding interactivity to the exhibits, embracing state-of-the-art technology, such as mobile audio guides.

Having already created a world-class exhibition, the museum's dedicated staff are not planning to rest on their laurels. Under their watch, future generations of helicopter enthusiasts will always find a welcoming home in West Chester, Pennsylvania.

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.

The Select Helicopter Services team. From left: Scott Provenzano, hydraulic technician; Joel Luksts, hydraulic technician; Sandra Stangier, administrative assistant; Andrew Shipley, assistant production manager; Dana Washington, quality assurance/logistics manager; Marty Luksts, general manager and founder; Dale Luksts, accounts keeper; Andy Kastak, hydraulic technician; Jeff Havard, stores manager; and Dell Luksts, production manager.

building FOR THE future

One customer at a time, Select Helicopter Services has built a thriving hydraulic component and cargo hook overhaul business.

Story by Ben Forrest | Photos by Darren Hull

Marty Luksts had clear and simple goals when he created Select Helicopter Services, a hydraulic component and cargo hook overhaul business, in a 400-square-foot shop in Kelowna, British Columbia, back in 2004. He saw space in the market for a company that could provide quick turnaround times at a competitive price, delivering the kind of service that has become one of his company's defining traits.

"What we wanted to do was be able to provide a quality service to our business network that would generate organic growth through referrals and things like that," said Luksts. "And it sort of worked out that way."

An aircraft maintenance engineer (AME) by training, Luksts started by connecting with people he'd come to know in a decades-long career that began at Viking Helicopters in Ottawa, Ontario, in 1975. He had studied to become an AME at Canadore College in North Bay, Ontario, and also spent time at Bow Helicopters in Calgary, Alberta, and Alpine Helicopters and Skyline Helicopters in British Columbia. By the time Luksts was ready to branch out on his own, some of his college classmates had become decision-makers in the companies they worked for, so he started there and hoped he would succeed.

"Mostly through referrals the business has grown substantially, year over year, for the last 13 years," said Luksts, who now serves as the company's general manager.

Within a year of its launch, Select Helicopter Services moved out of its tiny shop and into a 1,100-square-foot facility at Kelowna International Airport. The company stayed there 10 years but outgrew the space and moved into its current facility, a 3,800-square-foot building about five kilometers south of the airport.

"We're out of room again, so we're slowly looking for expansion as our capabilities increase and our customer base increases," said Luksts. "Generally, it's manageable. I think we're sort of looking to the future all the time to be prepared for the next step, whatever that might be."

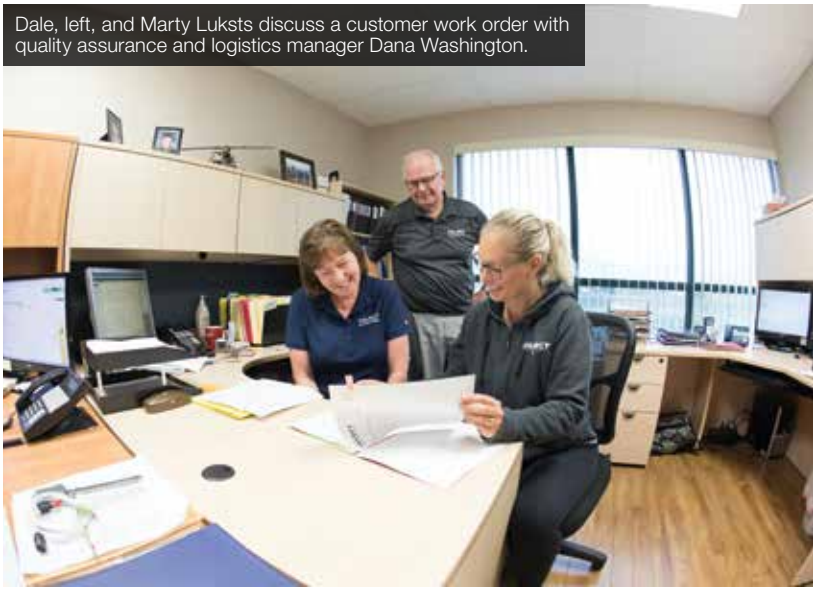
A FAMILY BUSINESS

The company started as a two-person operation and now has 11 employees, including five members of the Luksts family. Luksts said his company guarantees customers quality work, lasting value and personalized service.

Jeff Havard, stores manager, pulls parts for a seal kit to be installed in a hydraulic actuator.

Pistons rest on a shelf in the stores room.

Completed components, ready to be certified and shipped back to customers, sit in neat rows on shop shelves.



Dale, left, and Marty Luksts discuss a customer work order with quality assurance and logistics manager Dana Washington.

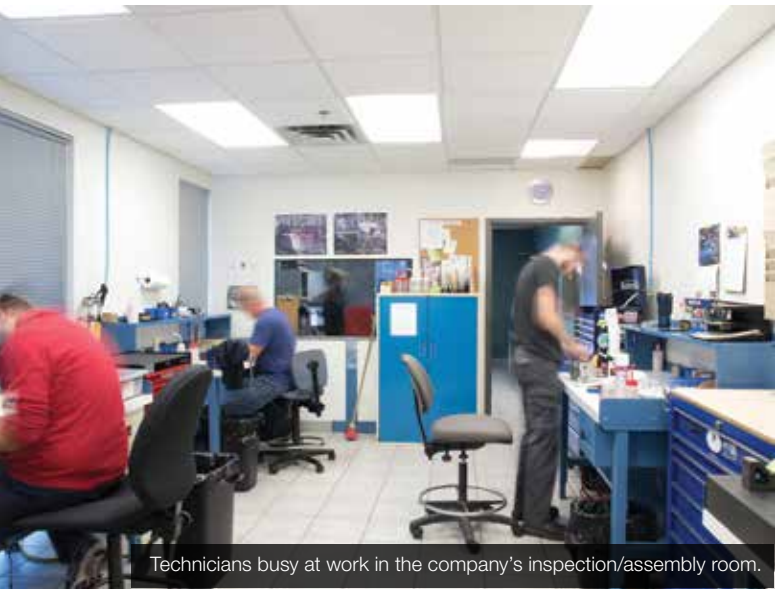
"The quality work, I think, is a pride thing," said Dell Luksts, Marty's son and the company's production manager. "We like to put out a top-notch product. The lasting value is: once we've worked on it once, it usually brings the customer cost down quite a bit. And then… personalized service: what we offer to our customers is that they can call us and they can talk to either me or Marty. They're not going through any other channels to find out what's going on with their product.

"Marty's always there for troubleshooting, and part of the service we offer is that if a customer calls and needs something tomorrow, we will do everything within our power to get it to them to keep them flying."

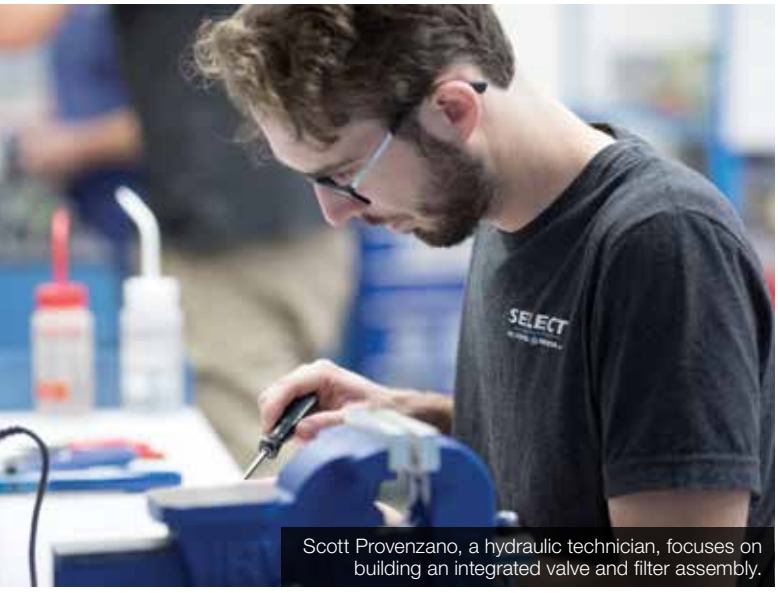
Marty's wife Dale is the company's bookkeeper, while their daughter Dana handles quality assurance and manages most of the company's administrative functions. Their youngest son, Joel, worked for the company this past summer, on break from his engineering studies at the University of British Columbia. Daughter Jana lives in Toronto, Ontario, but works remotely for the company, helping with quality assurance while also pursuing a career as a professional pianist.

"YOU WANT TO KEEP THEM EMPLOYED AND KEEP THEM INTERESTED AND KEEP THEM MOTIVATED. IT'S MAYBE AMPLIFIED A LITTLE BIT BECAUSE YOU HAVE YOUR OWN FAMILY WORKING IN THE BUSINESS.

— MARTY LUKSTS, GENERAL MANAGER OF SELECT HELICOPTER SERVICES



Technicians busy at work in the company's inspection/assembly room.



Scott Provenzano, a hydraulic technician, focuses on building an integrated valve and filter assembly.

Dana Washington stands with Dell, Dale and Marty Luksts.

"I think as a business owner you sort of feel responsibility to all your staff," said Marty. "You want to keep them employed and keep them interested and keep them motivated. It's maybe amplified a little bit because you have your own family working in the business. We've got 11 staff altogether, and we all seem to get along quite well, and it all sort of seems like a family environment."

The success of any company hinges on the quality of its employees, a fact not lost on Marty or Dell. They hold their staff to a high standard, but also treat them as if they were next of kin.

"We don't have an easy time finding people to do work to the standard we ask them to do it to," said Dell. "So when we find people that can do that then we do everything we can to keep them."

There is a time for work and a time for play, but in general Dell sees the shop as a happy place.

"If it's serious all the time, nobody has fun," he said. "We try to keep the attitude pretty light…. We have such a good group of people there, and I think there's a level of respect for Marty there that everyone's willing to hunker down when we need to."

PLANS FOR EXPANSION

Select Helicopter Services has been able to grow a global clientele, with customers in Europe, North America, Australia and Asia. The company overhauls a long list of hydraulic components, from valves to damper assemblies to servos for controlling rotor blades. It also overhauls dozens of cargo hook types and suspension assemblies.

"Select Helicopter has very quickly become our go-to people on the hydraulic side of things, and also cargo hooks as well," said Chris Williams, general manager of Helispares, a helicopter parts and components supplier in Hampshire, England. "We like the individuals there and they provide a very good level of service."

Mike Campbell, rotables coordinator for Eagle Copters in Calgary, Alberta, said the company's service is second-to-none. "If there's ever an issue, it's brought forth," he added. "There's never hidden charges. Their inspections are dynamite. We used to use several vendors for our hydraulics systems, and we just go to them now."

Those are the kinds of endorsements Marty hoped for when he started Select Helicopter Services, and they're likely what will drive the company as it continues to grow. Marty would like the company to become an original equipment manufacturer (OEM) service center, thought he admitted that has been a challenge since many manufacturers try to keep this kind of work in-house.

The company is looking at expanding into different product lines on the hydraulic side, and Dell would like to see it do more international work while continuing to serve its existing clientele.

As for what explains the company's success so far, Marty pointed to the philosophy he started out with: "to provide a quality product that's competitive in pricing, and just building customer loyalty that way."

Select Helicopter Services grew the way he thought it would — by taking care of customers, by providing exceptional service, and by doing it all quickly. One referral led to another, which led to another.

"That formula, I think, has worked quite well," he said.

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A front view of Pentecost Hoppi-Copter HX-1 backpack helicopter on a pilot's shoulders. **Jeff Evans Collection Photo**

The Hoppi-Copter Helicopter Venture

Beginning life as a helicopter worn as a backpack, the Hoppi-Copter aimed to launch a single-person helicopter market at the dawn of the civilian rotorcraft industry. **By Bob Petite**

As World War II drew to a close, before the first roots of the civil commercial rotary-wing industry in the United States had begun to take hold, a young Washington-based inventor had began dreaming of a small, single-person light helicopter that would offer the ultimate in portability.

Born in 1909 in Schenectady, New York, Horace T. Pentecost studied mechanical engineering at Purdue University. After beginning his professional career with the Socony Vacuum Oil Company, and then joining the engineering department at the General Electric Company, he arrived at the Boeing Aircraft Company in Seattle, Washington, in 1943. Much of his work with Boeing was classified, but he eventually specialized in the design of rotary-wing aircraft.

In his spare time, he began looking at the novel idea of a one-person helicopter that could be strapped on like a backpack. Pentecost could see how useful it would be for the military to be able to quickly transport individual soldiers over inaccessible areas, and felt a backpack-style helicopter would be simple to fly, and could be operated in a safe manner over short distances. Pentecost left Boeing in December 1945 to further the design and development of the helicopter — which would ultimately become known as the Model 100 HX-1 Hoppi-Copter — forming Hoppi-Copters Inc. at the Boeing Field in Seattle.

The first Model 100 had a 20-horsepower engine that powered two coaxial counter-rotating 12-foot (3.6-meter) wood rotor blades. The system was attached to the pilot through metal tubing and canvas straps on his or her shoulders, and weighed about 90 pounds (40 kilograms). The pilot controlled the direction of travel through an overhanging cyclic stick that had a twist grip for collective pitch to maintain yaw control, while the throttle control was located on the left shoulder strap. The unique backpack helicopter had no landing gear — other than the pilot's legs.

Pentacost emphasized that the Hoppi-Copter was not a toy, but a miniature rotary-wing aircraft of an advanced design. And, at the first public showing of his portable helicopter at the World Inventor Exposition in Los Angeles, California, in July, 1947, Pentecost was awarded second prize.

But despite recognition of the ingenuity of his design, only about 20 tethered flights of the Model 100 ever took place. Pilots found it was very sensitive and extremely difficult to fly, so no free flights were even attempted. Added to this was the fairly major consideration of what might happen should the pilot trip or fall while the aircraft was running — with the potential risk that the rotor blades could strike the ground, a nearby object, or the person attempting to fly it. Pentecost decided to abandon the Model 100 as a backpack-worn aircraft, and got to work redesigning it with landing gear.

TRICYCLE LANDING GEAR

The new Pentecost Model 101 incorporated the main feature of the Model 100 — the coaxial counter rotating wood blades — but had a single seat for the pilot above tubular tricycle-style landing gear. This new Hoppi-Copter was designed to meet the widespread market for civilian use as an inexpensive utility helicopter.

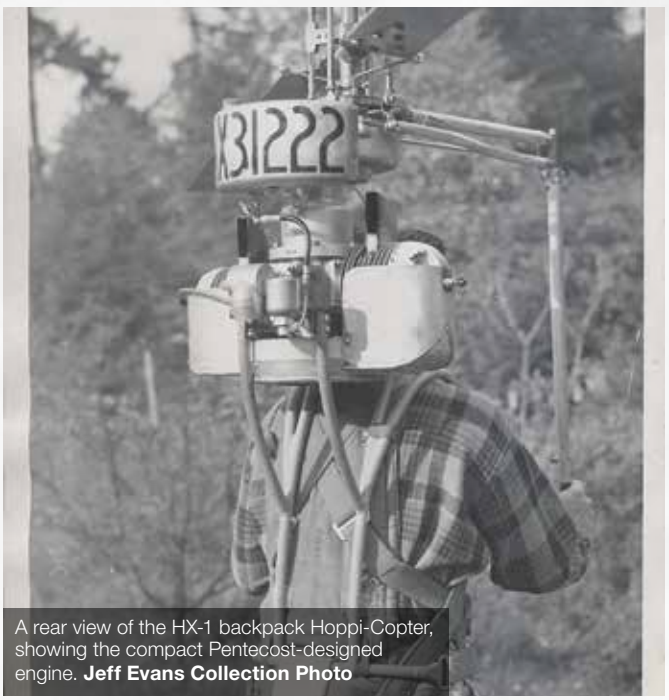
Pentecost then revised this version with engineering improvements to create the Model 102. He built three of these for use in flights under the direction of the Civil Aeronautics Authority.

The new Hoppi-Copters were developed with the assistance of Richard Prewitt, the former vice president and chief engineer of the Kellett Aircraft Company in Pennsylvania. Prewitt was retained to assist in the design of the Hoppi-Copter production model. He said that the Model 102 appeared entirely feasible, and that such a helicopter would have widespread utility in many fields. It was planned to be the company's first marketable product, with an estimated price of around $1,000.

The Model 102 had an open light tubular frame with a seat and a foot rest, and the pilot was secured by a safety belt. Started by pulling a cord wound around a flywheel, the aircraft had a 20-horsepower two-cylinder air cooled engine, designed by Pentecost, that had a fuel capacity of just seven pints.

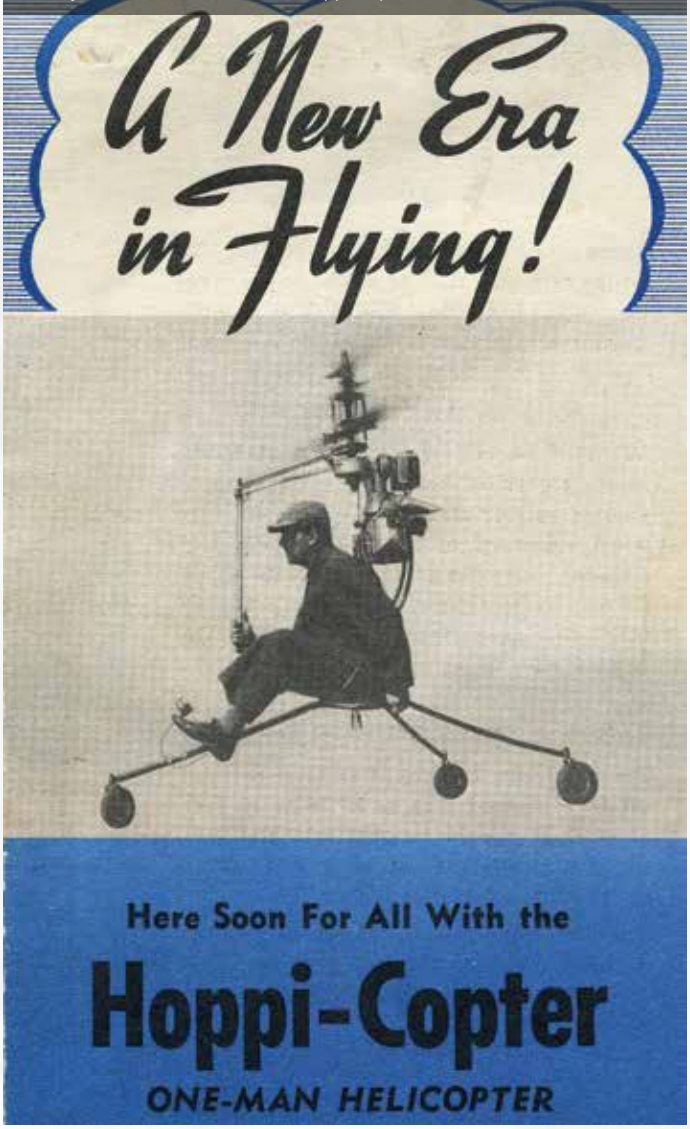
The aircraft's counter-rotating wood rotor blades had a diameter of 16 feet (4.9 meters), enabling it to land or take off in a cleared area as little as 30 square feet (2.8 square meters) in size.

The Hoppi-Copter pictured in England in 1948. Note the upgraded main rotor blades. **Jeff Evans Collection Photo**



A rear view of the HX-1 backpack Hoppi-Copter, showing the compact Pentecost-designed engine. **Jeff Evans Collection Photo**

An early brochure for the Pentecost Hoppi-Copter **Jeff Evans Collection Photo**



Its empty weight was about 100 pounds (45 kilograms), but it was capable of lifting a useful load well over its own weight.

The three Model 102 Hoppi-Copter prototypes carried out more than 100 captive and free flights, recording the type's first indoor flight on Aug. 2, 1947, and its first outdoor flight on Jan. 12, 1948, at Bow Lake, Seattle-Tacoma Airport in Washington. The pilots for the pioneering flights were Kermit Jones and Maurice Ramme, but they were limited to about 10 feet in altitude with a speed of 18 miles per hour. Hovering was kept to about three minutes at a time.

Jones and Ramme stated that the maneuvers were simplified by a single-stick reaction-type control stick, which permitted the Model 102 to move straight up and down, and forward or backward. The engine was later upgraded to 35 horsepower, with power supplied through a two-stage geared transmission turning the coaxial counter-rotating blades.

Pentecost estimated that the Hoppi-Copter would easily fly to a top speed of 90 miles per hour, with a rate of climb of 900 feet per minute, a cruising speed of 60 miles per hour, a range of 200 miles, endurance of one hour, and a ceiling of 12,000 feet. In the event of an engine failure, the autorotation of the main rotors permitted a safe descent and power-off landing.

He saw the Hoppi-Copter being used by surveyors, miners, hunters, prospectors, photographers, trappers, for forest and border patrols, and even used in crop-dusting. A Hoppi-Copter was even tested by the U.S. Air Force at Wright Field in Ohio, and the type was exhibited at the Civil Air Patrol Air Show staged by the Army Air Force in Renton, Washington.

Pentecost also envisioned the development of a light, enclosed, two-passenger, inexpensive Hoppi-Copter called the "Coupe-Copter." He felt that the Hoppi-Copter was the most versatile aircraft ever designed, and would introduce a new era in flying. He claimed his design opened up new horizons for business, pleasure, and public service.

ESTABLISHING A EUROPEAN BASE

In 1948, Pentecost accompanied two Model 102s shipped to England for evaluation. The plan was for one to be tested by the Royal Air Force Research, Development and Training Unit for rotary-wing aircraft at Beaulieu by experienced helicopter pilot S/L F.J. Cable. The other Model 102 was to be used for the possible

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development and manufacture of the Hoppi-Copter in the U.K. While no action was taken in starting an English operation — either civilian or military — at the time, the Hoppicopter Company formed in Bournemouth, England, in 1950. The plan was to manufacture the aircraft for export all over the world. The company was nothing if not ambitious — they hoped to eventually manufacture 850 units a month. But no Hoppi-Copters were ever built.

Applications for dealerships came from all the states in the U.S., as well as from 24 countries. Even missionaries in Malaysia, Borneo, and East Africa showed an interest. The company had applications on file for over 1,300 Hoppi-Copters, with most customers wanting immediate delivery.

At one point, the future looked promising for the versatile Hoppi-Copter, but by 1949, its design had gone through several variations without resulting in a production model being ready for sale. During this same period, the Bell Aircraft Corp., Sikorsky Aircraft, and Hiller Helicopters all had developed civil helicopters for sale — albeit much larger than the single-place Hoppi-Copter. And there were no military sales or research contracts for the aircraft, either. The military did not see the one-place Hoppi-Copter as a replacement for transporting the lone infantry soldier where needed on special missions.

Pentecost lost control of his company about the time the Hoppi-Copter was to go into production. American Hoppi-Copters, Inc. of Washington, D.C. was later formed to try and start up the production of the aircraft, but the company failed.

Pentecost attempted to start another new company, called the Capital Helicopter Corp., in January 1954. He planned to use his C-1 Hoppi-Copter, and was able to get his patents back for the aircraft. He designed and eventually flew a new version of his Hoppi-Copter, powered by small pulse jet engines on the rotor-blade tips. However, success was not to be for Pentecost, and this company also failed. This spelled the end for his vision of a light one-place helicopter industry. As it happened, the U.S. military did become interested in a light single-place helicopter later in the 1950s — but it was well after Pentecost had left the helicopter industry.

"According to my father, the design of the Hoppi-Copter had good potential, and he held the inventor Horace Pentecost in great regard," said Dan Jones, son of pilot Kermit Jones. "However, the financial people decided they could make more money by going public than invest in further development. The final straw for my dad was when they announced that he would be paid in stocks for his test flying services. He then decided to go back to the agricultural side of the business, flying Bell Model 47B-3 helicopters for Central Aircraft in Yakima, Washington."

The prototype backpack Model 100 was donated to the Smithsonian Institution/National Air and Space Museum in Washington, D.C. in 1952. Today, it is on display at the Pima Air and Space Museum in Tucson, Arizona.

Bob Petite | Bob is a member of the Twirly Birds, AHS International, the Canadian Aviation Historical Society, the American Aviation Historical Society and the Bell 47 Helicopter Association, Inc. He is the author of *The Bell 47 Helicopter Story.*

The Pentecost HX-1 backpack Hoppi-Copter on display at the Pima Air and Space Museum in Tucson, Arizona. **Jeff Evans Collection Photo**

A side view of a run up of the Pentecost Model 102 Hoppi-Copter.
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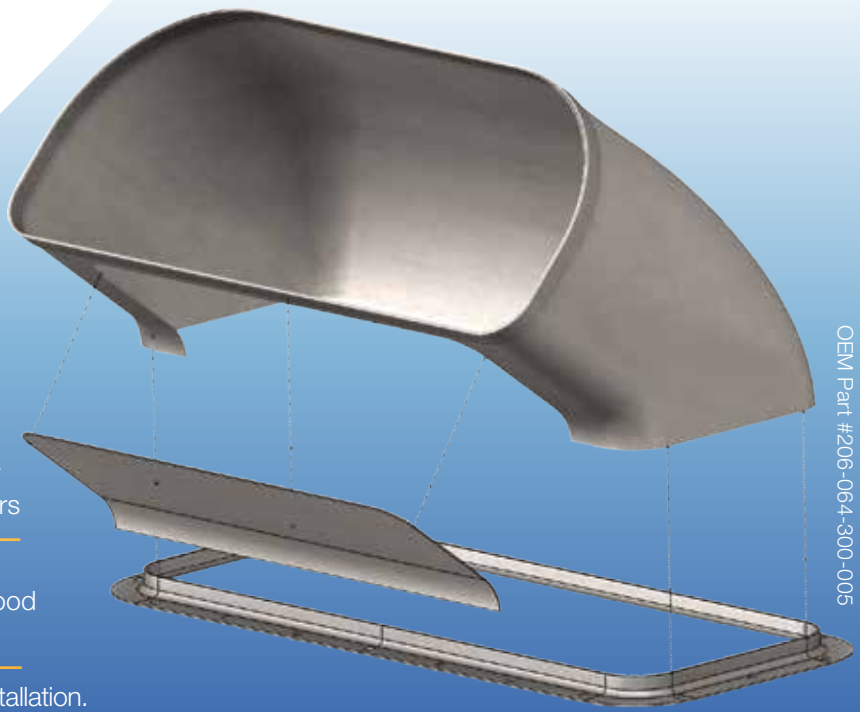

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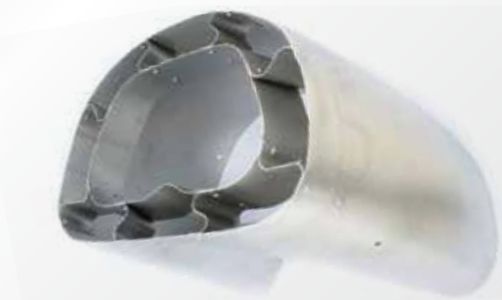

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THERE I WAS... | **BY MIKE MUENCH**

MY FIRST FLYING JOB

"Son, I can shoot a shotgun in any direction and knock a dozen helicopter pilots out of the trees," said the old man behind the desk in response to my job query. While trying not to be offended by this crass remark, I had a hard time shaking the image of flocks of helicopter pilots roosting on the branches of nearby trees.

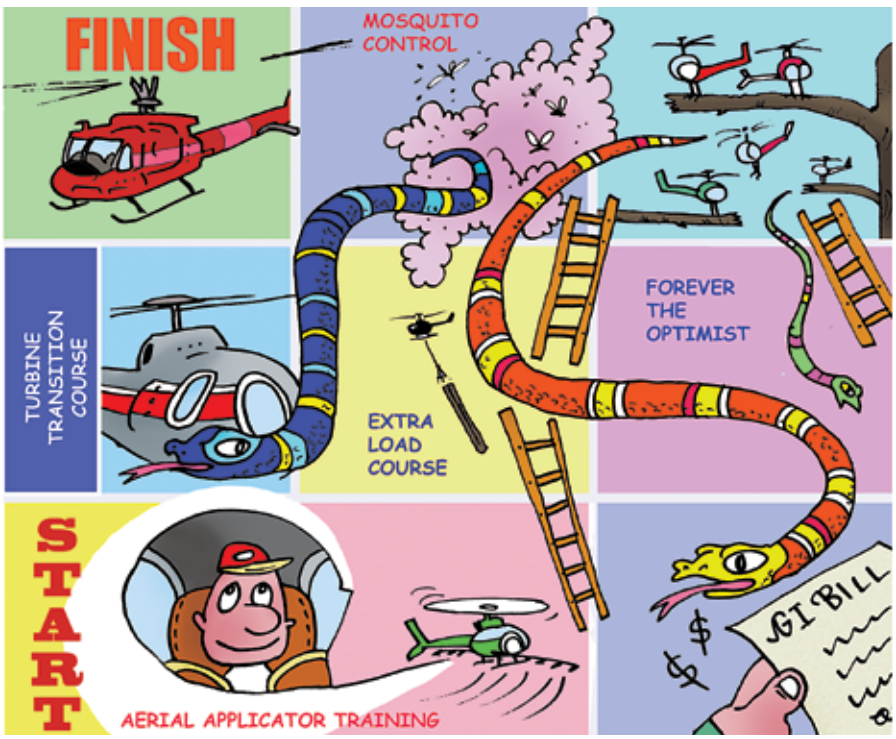
The U.S. Army was discharging fully qualified helicopter pilots due to a reduced demand for them within the force, resulting in stacks of resumés on operator's desks, rumored to be elbow deep. How could a low time rookie like me compete?

Then, as today, the way you obtained your rating may have something to do with whether you got hired. There's the military route, which is often termed "free" training, but in reality can end up being the most costly of all. Then there's the well-to-do "self-pay" route, (and generally, if you can afford to self-pay, you are probably not competition for a job). The most aggressive competition probably comes from the students that take out a loan and then make a deal with the school to join the staff and instruct there once his or her certified flight instructor training is complete. For veterans, there's also the G.I. Bill to help them afford training. Without the G.I. Bill, I'm not sure I would ever have flown a helicopter.

Insurance requirements can block low time pilots like I was from ever getting a start. But local government agencies often self-insure or they have a blanket insurance policy that covers everything the agency owns or operates, so a low-time pilot doesn't change the overall budget that much. When I applied for a job that I wasn't qualified for, I expected the worst, but forever the optimist, I hoped for the best.

The interview at the local county government's Mosquito Control Commission was cordial. I was told that the previous pilot had cost the county a considerable amount of money in spray pilot training. Unfortunately, that pilot promptly quit after completing the training. That's never a good thing for the next pilot that comes along. Hiring and training me was something that they just couldn't justify, and I understood their predicament. I heard it through the grapevine that there were no other spray-qualified applicants for the job, either. That got the little wheels turning.

I proposed that in exchange for a job offer, I would pay my own way through helicopter aerial applicator training. The interviewers weren't expecting that. They huddled and mumbled and nodded and shrugged their shoulders and scratched their heads. Then they told me that they would hold the job open temporarily and if I was trained and received the proper graduation certificate before the start of the next New Jersey mosquito season, the Commission would favorably consider hiring me. Deal!



Chris Rohrmoser Illustration

Winter had almost arrived and luckily the Department of Veterans Affairs (VA) approved my training at AgRotors in Gettysburg, Pennsylvania. Woo-hoo! My first helicopter job was in sight! Well, almost.

I hadn't flown in a long while, so before taking the Aerial Applicator course, I enrolled in the external load and turbine transition courses, mostly to reinforce what very little experience I had: a few hundred hours fixed-wing and a total of 30 hours helicopter time. Twenty-five hours was the minimum for a commercial add-on helicopter rating and that's just about all I had. To say I was rusty would be a gross understatement — I was glad I wasn't standing in water, because I was in way over my head. It was hard to imagine that in another couple of months I would be ready to fly around towers and wires, skimming treetops and who knows what else on a daily basis. I wondered if I was making a big mistake trying for such a dangerous first job. It's often said: "Be careful what you wish for…"

The External Load course was first and a great way of getting my skills up to speed. My instructor had me practicing all the basic maneuvers. Then I was lifting telephone poles interspersed with autorotations to a snow-covered pasture — often at night, touching the Bell 47 down on frozen ground. My autos got better, and with a little practice and a bright landing light, I was sliding them on — once plowing the skid into a frozen cow pie and pushing it along until the helicopter skidded to a stop. Yup, this was farm country. I was finally getting back the feel of flying.

The turbine transition course was next, with 15 hours in a Hughes 500. The VA was paying 90 percent of the cost, and for that I was grateful.

Finally, it was time for the big guns: the 35-hour Aerial Application with a Concentration in Mosquito Control Techniques course.

Each of the above courses came with ground school, and by the time I had completed all of the training, and scheduled the final flight test, I was anxious for it to be over. I took the check ride for the ag course at night, in 50-mile-per-hour winds, and in blowing snow. The chief flight instructor gave me the option of skipping the check ride. I would get a logbook sign-off but no certificate. I said that I needed that certificate for the job offer. So off we flew, doing "ag turns" in gale-force winds.

I passed the check ride, got the certificate, and was offered the job. I accepted the offer and never looked back. If nothing else, it was a lesson in the power of optimism.

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