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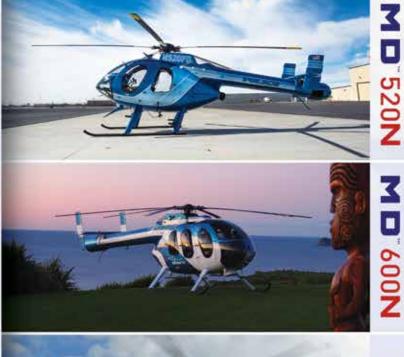
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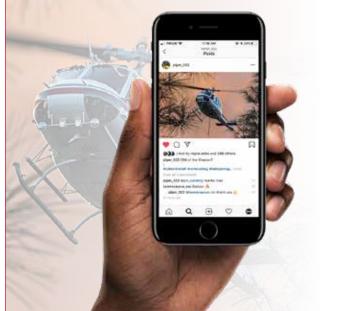
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JMN



As we approach the Christmas season, I can't help but reminisce about an annual Christmas project our local Rotary Club has in Labrador called "Santa To The Coast." A bunch of crazy Rotarians get together every year to pack hundreds of gift bags, and with the gracious help of Air Borealis and a Twin Otter we deliver these gifts along coastal Labrador with Saint Nicholas himself in attendance!

Many children on Labrador's remote coast would not get to meet Santa otherwise, as there is an acute shortage of shopping malls there for Santa to frequent. So, it is a great way to start the Christmas season and spread a bit of cheer. But it is not all eggnog and fancy decorations. There are risks and hazards to consider.

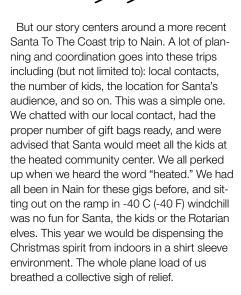
The tradition was begun by the Royal Air Force and Royal Canadian Air Force in 1960 (our Rotary Club picked up the baton in 1990) — so we are coming up on our 60th anniversary! During the last half century there have been some interesting incidents. In the early days without any landing strips, the Air Force would drop the gifts by parachute if ice conditions were poor. During one drop, several of the chutes did not open and a pallet of gifts landed in a backyard in Nain, on Labrador's north coast. There was a resounding thud followed by an explosion of colorfully wrapped gifts! Thankfully no one was hurt and one family fared very well.

During a subsequent para drop for another Christmas, all packages landed safely on the sea ice outside the harbor, but there was quite a wind blowing at the time. Pallets of gifts with their parachutes still attached began to scatter across the bay. One energetic resident took immediate action to ensure the gifts got to Nain where they belonged, and jumped on one of the pallets sliding along the ice. His efforts and weight made no difference at all to the speed of its transit across the harbor. One lady later recounted that he was last seen going around a headland to the south. Folks were questioning whether or not he would make it back before Christmas! It would be awhile before the movie *Dr. Strangelove* would come out, but that the scene would be reminiscent of Slim Pickens riding the bomb to the ground.

Of course there is also the event that I have written about before. During a past Santa To The Coast, confused hand signals between Santa and the aircraft's loadmaster led to a whole planeload of gifts being prematurely shoved out the door of a single Otter on approach to Hopedale. Local townspeople spent weeks picking up assorted Christmas fare off the sea ice.



During a subsequent para drop for another Christmas, all packages landed safely on the sea ice outside the harbor, but there was quite a wind blowing at the time. Pallets of gifts with their parachutes still attached began to scatter across the bay.



And so it came to pass that we took off in a Twin Otter with Santa and gifts in tow. Having arrived in Nain, we made ready to offload gifts to waiting pickups for transport to the community center. But one of the trucks looked a little out of place. It was one of the local fire department trucks and was very brightly decorated for the season with a very conspicuous chair up in the pan. Hmm. I wonder who the chair is for?

We all scurried to the waiting trucks so as not to spend too much time in the elements and as Santa went to step into one of the warm crew cab pickups, a fireman came up beside him.

"Oh, not you Santa," said the fireman. "You're getting up in the back of the truck so we can do a Santa parade through town!"

There was an awkward pause as Santa contemplated his fate. Even though he looked the part, he was ill prepared for -40 C, and the bit of insulating stuffing he had under his red coat to expand his girth would not be of much help to the rest of his body. At this point you would think his elves would intervene on his behalf. We all continued to jostle for position in various vehicles and simply refused to make eye contact with poor Santa. He should not have put on the uniform if he could not take a joke!

By the time Santa finished his parade duties and came into the hall, we had all the gifts ready for presentation. It was so warm we had to start peeling off layers to stop from sweating. Santa had other issues. His extremities were numb and if we could have seen though his frosted glasses I am sure he would have been in tears... had they not been frozen. It took Santa a while before his lips would move, so the elves did most of the work while Santa just sat in a big chair and slowly thawed out.

In real life, our Santa, like his elves, is in the aviation business. The old adage about dressing for a flight as if you have to walk home holds serious weight in our northern climates. Thankfully, our story has a happy outcome, and those of us who dress rather lightly for such northerly missions had learned a valuable lesson. After several coffees with Baileys, Santa recovered nicely during the flight home, and the guy riding the parachute pallet of Christmas gifts made it home for Christmas.

Merry Christmas, everybody! 📀

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JUDGMENT ERRORS WITHOUT INCIDENT

FOCUS ON TRAINING // ANDY ROE



As long as humans are controlling helicopters, accidents and mishaps are going to occur. Ongoing safety and decision-making training is still the best way to minimize unsafe events. Most pilots, whether they admit it or not, make errors in judgment from time to time that subject the helicopter to risk — but often end without incident. Pilots can learn from "close call" experiences by analyzing the actions and behaviors that led to them, and planning ways to prevent similar future incidents from occurring. Pilots with this mindset are in good control of their flying careers.

When a helicopter crashes, accident investigators determine the cause(s) and make recommendations to try to prevent the same thing happening again. Errors of judgment without incident should be analyzed in the same way. A close call can happen when a decision is made with minor variations from the ideal. Crashes generally result from gross negligence or major pilot error.

I can recall three situations from my early flying career that could have resulted in accidents, but didn't. The specific risks I exposed myself to were dynamic rollover, illusions on approach, and loss of visual reference. Because of this, I learned a great deal about each of these helicopter hazards and how to prevent similar risks in the future.

When I was lifting off to the hover one cold winter morning, the skid gear was partially frozen to the cold surface. One skid broke free slightly before the other, upsetting the balance of the machine as it was lifting off. It was a wake-up call about the safety problems associated with dynamic rollover, and it caused me to think more seriously about all future liftoffs.

The dynamic part of these rollover accidents happens when the pilot senses that

the aircraft is hesitant to leave the surface, and then pulls up harder on the collective pitch. If one side of the landing gear is pinned to the surface, the airframe then accelerates over onto its side with devastating results. Because I only applied normal takeoff power with the collective, the dynamic part of a rollover did not occur. However, the unbalanced takeoff opened my eyes to the dangers of rollover accidents close to the ground. I learned a lot from that first error of judgment experience.

Safety is paramount in all aviation activities and those who learn how to prevent small errors of judgment from recurring are the ones most likely to end up with long and successful careers.

On another flight, I was approaching a wharf on the shore of a lake. The helicopter had fixed floats and I was overconfident about safety above the water. Although the surface was not glassy, it was difficult to judge the water's depth. On what I thought was a good approach to the wharf — not too steep, not too low — I was shocked about 650 feet (200 meters) out when I saw rough water beginning to form in front of the helicopter from the rotor downwash. With my approach much too low, I pulled power, overshot and set the whole thing up again properly.

After landing, I reflected on the implications of such a poor approach, which could have had less-than-ideal results if the front of the floats had plowed into the water surface. From that point in my fledgling career, I took over-water maneuvers much more seriously. I began applying the night-flying technique of managing height and airspeed on approach, with reference to the instruments as well as outside visual cues, when depth perception was restricted.

One more cringeworthy lesson happened early one summer morning when I was on approach to drop off customers in a remote wooded area. The overnight had been chilly and there were wisps of fog about the area, even though the sun was shining. With only about 500 hours of experience, I was cocky and a bit over-confident, but feeling good about the day's work ahead. Suddenly, I lost sight of the ground in one of those fog patches and everything against the bubble was bright white.

I knew instantly that I no longer had control of the helicopter or the situation I was in, being fairly close to the ground. Then, as quickly as I had disappeared, I emerged into the sunlight again, overshot the landing and set it up again. It was a pivotal moment for me and a lesson I will never forget. Losing sight of the ground in a light visual flight rules (VFR) helicopter is normally a death sentence. VFR pilots must learn to be vigilant about fog and weather and always maintain visual contact with the world outside.

The next time you drive up to an ATM or takeout window, have a look at all the black tire rubber marks on the curbs. If there was an ATM that was designated for helicopter pilots only, I would expect to see one lone scuff mark. That pilot/driver hopefully learned to pay more attention to the car's alignment between the curbs in the future.

Even with good training, helicopter pilots make errors in judgment from time to time and can learn greatly from these events. Experienced pilots must have many stories of their own to tell of close calls that they have learned from. New pilots must take decision-making training very seriously and learn from events in the air that do not go exactly as planned. Safety is paramount in all aviation activities and those who learn how to prevent small errors of judgment from recurring are the ones most likely to end up with long and successful careers.

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COLUMN PREPARING FOR THE ADS-B DEADLINE

FOCUS ON MAINTENANCE // JOHN CARINHA



By the time this column graces your favorite reading nook, lunchroom table or bathroom, the United States aerospace industry will be on the heels of the Federal Aviation Administration's (FAA's) mandated ADS-B implementation.

ADS-B (automatic dependent surveillance-broadcast) is a means to revolutionize air traffic management, which in the U.S. forms part of an initiative known as NextGen. The FAA Modernization and Reform Act of 2012 spells out the basis of NextGen, which includes a plan to ultimately decommission ground-based radar surveillance and adopt an advanced surveillance technology which is GPS-based. These advancements serve to benefit aircraft operators and reduce airspace congestion and emissions by providing greater flight efficiency and safety.

ADS-B "Out" is mandated to take effect by Jan. 1, 2020, for all aircraft operating in Class A, B, C and E airspace (with restrictions). Aircraft that are not in compliance may be denied airspace access. ADS-B Out, in layman's terms, means an appropriately equipped aircraft will transmit its identity along with its position from an onboard WAAS GPS receiver to ground-based stations as well as surrounding aircraft equipped with ADS-B "In" capabilities.

As the names suggest, "Out" means you tell the tale of who and where you are; "In" relates to you receiving these similar "Out" messages from other aircraft. The harmonious idea is that traffic management becomes more efficient, safe and somewhat layered with a degree of self-governance by virtue of better situational awareness as it pertains to other traffic.

Each aircraft will indirectly create its own bubble of safety, whereby separation minimums can be more accurately measured, sustained and further decreased to manage congestion with a greater safety margin.

Although this mandate was initially met with an outcry from the general aviation sector, larger operators, including worldwide cargo carriers, are embracing it. Fleet operations are greatly improved by the added real-time tracking of each aircraft. Search-andrescue operators applaud the idea of ADS-B, because locating downed aircraft will be much easier with its improved accuracy and reliability over ground-based radar stations. And by comparison, ground-based ADS-B stations are physically smaller in size and much easier to construct and place, making them a favored option for hard-to-reach and remote areas where radar coverage is minimal at best. A Johns Hopkins University study concluded that ADS-B is 200 times more accurate at a 40 nautical-mile (74-kilometer) range than ground-based radar. The benefits don't end there.

> ADS-B... is a forward-thinking, proactive technology that benefits everyone, from the cockpit out.

The reduction of fuel consumption and relative emissions is achieved by the inherent benefit of precision of distance calculations. Flight crews, having a better grasp of their situational awareness relative to traffic, can fly a more direct route with reduced deviations from waypoint to waypoint. Further to this, FIS-B (flight information services-broadcast) and TIS-B (traffic information services-broadcast) broadcasts contain textual and graphical weather and traffic information derived from ground stations. Through an ADS-B data link which serves as part of the onboard ADS-B equipment/receiver, this information is interpreted and displayed on a cockpit display that includes, but is not limited to: an electronic flight display, multifunction display, panel-mounted GPS or an iPad or similar portable device. And, for the frugal-minded, the information broadcasts are free. The equipment, of course, is not.

At minimum, for a general aviation operator who flies below 18,000 feet (5,485 meters), there are simple solutions for under \$2,000 that install between your existing transponder and associated antenna. For those with existing equipment, such as a mode S transponder and a panel-mounted GPS option, an extended squitter modification to the former and a WAAS upgrade to the latter would put you in compliance with the mandate - but conversely, you will be out of pocket north of \$7,000 in the upgrades alone. An all-out transponder replacement requiring an ADS-B capable transponder with a built-in WAAS GPS would be near half that. Truly, it's a conversation to have with an avionics shop that can assess your aircraft and/or fleet and match your budget to the requirement and your existing equipment.

Our industry is built on fundamental safety elements that are often revised based on reactive measures. As an example, the response to a China Airlines Boeing 747 flight 611 that crashed in 2002 due to an improper doubler repair and propagating fatigue cracks resulted in changes to inspection intervals and structural repair schemes worldwide. With the case of ADS-B, despite aviation's storied history, this is a forward-thinking, proactive technology that benefits everyone, from the cockpit out.

In my mind, it's beyond cheap insurance or a second set of eyes. It's embracing a new attitude coupling pilot, plane and surroundings in a much more safe, concise and efficient use of airspace.

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FOCUS ON LEADERSHIP // KIM HUTCHINGS

) UMN



66

The next time you have a new customer or vendor come in, observe how they are feeling. Are they looking around and smiling, feeling confident about your operation, or do you notice a look of concern?



For three weeks each fall, the State Fair of Texas takes place in Dallas. Millions of people pass through the gates every year. For some, it's to eat all the fried and barbecued food they can get their hands on. For others, it's all about the fun and crazy rides.

When my kids were young, we did all that sort of stuff - fairs, carnivals and amusement parks. They loved going on the rides, working their way up as they got older and taller to go on the bigger, faster rides. The big state fairs and amusement parks were fine, but I always worried about the traveling carnivals. You know the ones — you're afraid to get on the rides because you just know there are missing bolts. You suspect the people working the carnival don't care enough to ensure safety is first. If you dare get on a ride, you fear that at any moment you could be catapulted out of your seat and flung across the parking lot! Or you could be on the seat at the top of the Ferris wheel when it stops working.

Going to Disneyland is a completely different story. They call it the "happiest place on Earth," and they work really hard to make you believe it (aside from all those high prices and long lines).

Regardless of if you were "happy" while you were there, you did feel safe. Getting on a ride did not feel like it was a gamble as to whether you'd get off in one piece. There are solid stairs and paths leading up to rides, not rickety stairs that shake as you walk up to the ride of potential doom! At Disneyland there are signs reminding you to watch your step and signs identifying any hazards. They often have a cheery but assertive message plaving over a speaker, as well: "Please keep hands and feet inside your cart until ride comes to a complete stop." You don't get that treatment at the traveling carnival. You're lucky if they even check to see if you have sat down and are completely buckled into your seat before they launch the ride.

Whether you are visiting a state fair, a travelling parking lot carnival or a mega amusement park, you can feel almost instantly what sort of "safety culture" the operation has in place.

Often, these operations are focused on the employees' safety, but there may not be much emphasis on how the customer actually feels.

That's not to say there is a lack of concern for the customer safety; that's not it at all. Usually extra customer safety parameters are in place. The question to ask is, "Do customers feel safe in your hands?"

Authors James Roughton, Nathan Crutchfield

and Michael Waite offer tips on examining organizational culture in their book, Safety Culture: An Innovative Leadership Approach.

They describe three primary levels artifacts, espoused values and underlying assumptions — as first described in Edgar H. Schein's book, *Organizational Culture and Leadership.*

The first level is "artifacts." These are the visible organizational structure and processes. They include tangible items that are seen around your operation. This is where the mega theme parks would have all their curbs painted yellow with a sign that says "Watch your step." There is also a level of orderliness in the appearance of equipment and its maintenance. That means no rickety stairs to the ride of doom!

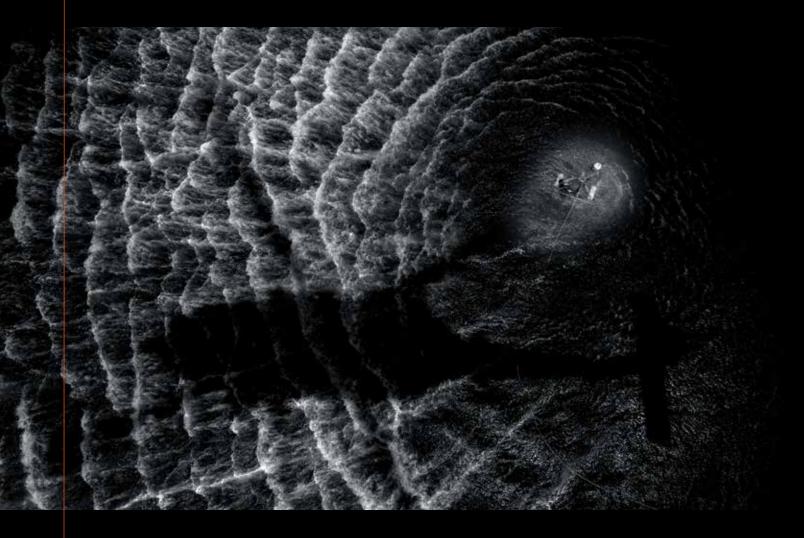
The second level is "espoused values." These are the goals, values and strategies used by leadership to guide the organization. The "happiest place on Earth" uses its values to guide decision-making to ensure all customers are treated with respect and that their safety is a priority.

"Underlying assumptions and unspoken rules" is the third level. These are the invisible rules followed by leaders and employees of an organization. This is where the customer feels safe. In order to have that "feeling," the espoused values and underlying beliefs can't be at odds. The parking lot carnival may have safety-related signs in place, but the feeling you get when you are there is, "I hope this ride doesn't come apart" or "I hope this ride attendant knows how to run this ride."

Having Levels 1 and 2 in place are not very difficult to achieve in an organization. It's Level 3 that sets the parking lot carnival and the mega theme park apart. It's simply that feeling you get when you go through the entrance gates. The goal is to have your customers, vendors or a person off the street be able to feel your safety culture immediately, not just your employees.

How do you think your safety culture would be viewed by someone off the street? Does it have the safety feel of a traveling parking lot carnival, or does it give a Disneyland-level feeling of security? The next time you have a new customer or vendor come in, observe how they are feeling. Are they looking around and smiling, feeling confident about your operation, or do you notice a look of concern? Take these cues from outsiders to let you know if your safety culture has all three levels in place.

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COLUMN LET'S NOT SETTLE ANYMORE

FOCUS ON OPERATIONS // COREY TAYLOR



It's almost 2020, and with so much available in the way of technological solutions, why do we keep dropping loads from our helicopters? We still see accidental drops, wrong switches, inadvertent touches of the right switch, electrical glitches, improper rigging — the list goes on.

The reactions I have seen, regardless of the impact, run the gamut from a collective shrug, to a chartered jet-load of Englishmen invading the continent to investigate a socalled "high potential incident." Those fellows didn't appreciate my analogy that over two million meteorites had struck the Earth since the birth of Christ, yet no one had ever been killed by one. I was trying to explain how unlikely it was that a dropped load would ever strike anyone if proper airmanship rules were followed. They seemed to view my explanation as a sign of a flippant attitude. I was hurt, as I have taken all these incidents very seriously.

Unacceptable they are, but I confess I have enjoyed watching a few dropped loads hit the ground. I'm sure it sounds environmentally insensitive to say that a five-ton load of concrete in an aluminum bucket hitting the ground at 80 knots and plowing up rubber trees for a couple hundred meters was one of the coolest things I've ever seen... but it was! The 9,000-pound (4,080-kilogram) rig mat that fell from over 1,000 feet and cleared a section of boreal forest down to the permafrost also has a special place in my heart. The winner though, has to be the 1,000 US gallons (3,785 liters) of diesel, formerly contained in a couple of ruptured bladders, that ended up in a heavily wooded area surrounded by swamp. The environmental experts asked if it was possible for us to burn it before it spread. Don't ever ask a born pyromaniac, from a long line of pyros,

if it's possible to burn something. Dousing 1,000 gallons of diesel with 50 gallons of avgas and then shooting it with a flare gun out the window of an AStar is one of the highlights of my career. But I digress.

The very first load I ever dropped (yes, I have had several — and so has every pilot I know who does extensive external load work) was due to cockpit configuration differences and a lack of training. When the airport called me on the radio, imagine my surprise when those diesel drums headed for the ground as I keyed the microphone. Well, I thought it was the mic. This was just another case of an unguarded switch that operated a key system.



I like to say we should never make the same mistake twice; that we should strive to make new and creative ones. There's nothing creative about dropping a load accidentally, so let's try to do better.

For at least 50 years, this industry has tried to prevent the dropping of loads through human error and mechanical failure. The ability to carry external loads is what makes a helicopter exceptional, as passengerhauling isn't remarkably different from flying a short takeoff and landing fixed-wing. When you can put a 200-foot (60-meter) longline into the trees and get water from a tiny pool (sometimes with fish!) to bring your turn-time to half that of your belly-hooked or tanked buddies, your feeling of superiority is likely to result in a cracked helmet. This ability is what keeps us employed, but does our desire to accomplish the mission get in the way of reasonable safeguards? I wish to argue we

should "almost" never drop another load, and we won't if we stop accepting them as part of doing business. When we haul humans around on the end of our long lines, we take extra precautions, some of which can be expensive, but it's the refusal to accept an accidental release for any reason that led to those precautions. We need to apply that attitude to more mundane loads.

I recently dealt with a dropped-load incident that was caused by the inadvertent touching of an unguarded switch. A previous incident resulted in all company aircraft — of that type — getting guarded switches. This last incident was almost identical in cause, but occurred in a different type of aircraft. Now we have guarded the switches of those, too. Can we not move from the reactive to the proactive? Is it unreasonable to ask that every safety-critical switch have either a guard or some other way to prevent accidental activation?

Once our switches are all fixed, there are new hooks that have built-in safeguards like time-delay, which mean an inadvertent button press gives you a second or more to change your mind. The only thing released is adrenaline as you thank your lucky stars for that second chance. This alone could have prevented many drops I am aware of, and probably many more I know nothing about.

I have heard people insist we already take this subject as seriously as we can, but if you don't stop everything you're doing and put all resources into preventing recurrence after an incident, then you're implicitly accepting it as routine, regardless of how much we might "care."

Years ago, we had crappy hooks with crappy cables connecting things together. Nowadays, we have no one to blame but ourselves for further incidents, beyond the odd freak occurrence. I like to say we should never make the same mistake twice; that we should strive to make new and creative ones. There's nothing creative about dropping a load accidentally, so let's try to do better.

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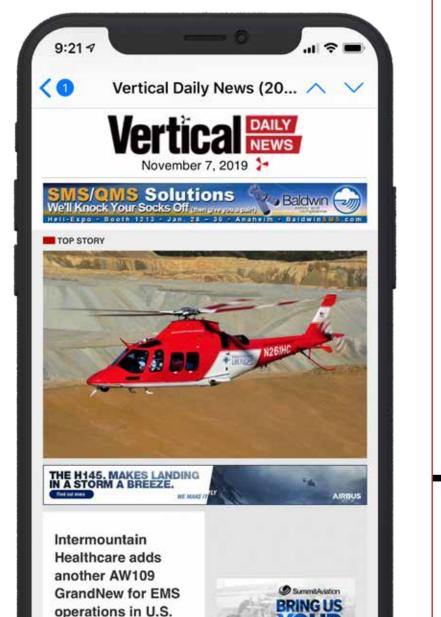


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SB issues final report on 2017 lydro One helicopter crash



BY KEN POLE

Unclear procedures for carrying external loads has been identified by the Transportation Safety Board of Canada (TSB) as a key factor in the fatal crash of a Hydro One Airbus AS350 helicopter near the eastern Ontario community of Tweed in December 2017.

In its final report released on Oct. 30, 2019, the TSB added that there is also a dangerous regulatory "ambiguity" in the Canadian Aviation Regulations (CARs) concerning passengers' safety belts.

The main cause of the crash, which killed the pilot and the three power line technicians on board, had already been identified as a canvas supply bag which flew off the helicopter's starboard external AirStair platform at an altitude of 230 feet (70 meters), striking the tail rotor and resulting in a catastrophic loss of control as the helicopter came in for a landing.

The pilot remained belted into the spinning

helicopter but the three technicians were ejected before impact. Investigators found two of the three lap belts unfastened and all shoulder harnesses taped out of the way.

Ewan Tasker, the TSB's manager of air investigations for the Ontario region, told reporters that in addition to the supply bag, the position of which was uncertain, a large pulley and two large tool bags had been attached to the AirStair.

"Although we knew what happened early, finding out why it happened took much longer," said Tasker. "Why wasn't the bag secured to the AirStair and why were the passengers not wearing the safety belts?"

He said it had become practice for technicians to attach their tool bags and other small loads to the external platform for travel to and from worksites. "In fact, there was no formal guidance prohibiting the carrying of these small external loads during these transit flights."

As for the safety belts, Tasker said there was an evident "perception that wearing the shoulder harness is somehow optional as long as the lap strap is used."

Fox pointed out that soon after the accident, the TSB issued an Aviation Safety Advisory Letter with two messages: that external cargo had to be secured at all times and that if safety belts were not used properly, passengers risked serious injury or death in an otherwise survivable accident.

She said TSB investigations over the years had identified 62 accidents in which shoulder harnesses had not been used, contributing to a total of 37 fatalities.

The definition of safety restraints in the CARs is "either a lap strap or a lap strap combined with a shoulder harness."

Fox said the use of "either" left it unclear that both must be worn. "Pilots and passengers may therefore interpret this . . . to mean the use of a lap strap alone is sufficient, as was

the case in this operation. We want that uncertainty removed."

She acknowledged that while their combined use might not have saved lives in the Tweed crash, "the proper use of safety belts is known to significantly reduce the risk of severe injury or death."

Transport Canada has 90 days to respond to the TSB findings; but in the meantime, Fox urged the industry "to be proactive: buckle up."

Tasker noted there was also a possibility that the shoulder straps were taped up because experience had shown that they could interfere with the technicians' body harnesses.

Fox added that Hydro One had "no prohibition against carrying tools outside the helicopter when it was in a transit flight, as in this case, from the worksite to the staging area . . . There was no procedure for doing so, there was no training, there was no checklist." In fact, she said, it had become common practice for technicians to carry tools outside the helicopters.

Fox said that in the aftermath of the investigation's preliminary findings, Hydro One had moved to address some of these issues.

Asked by Vertical whether it's incumbent on pilots to refuse takeoff until all aboard are properly secured, Fox replied that, "It is ultimately the responsibility of the pilot in command to ensure that passengers are . . . wearing their safety belts."

Sometimes, however, pilots pick up passengers while their engines are still turning and the aircraft is still light on its skids.

"That requires a lot of concentration on the part of the pilots; therefore, an informal practice had developed where the technicians would board and then attach their safety belts and give a thumbs-up to the pilot, indicating that they were ready to depart," she explained.

Tasker dismissed a suggestion that a "culture of complacency" had evolved among the Hydro One crews.

The TSB does not attribute blame or assign civil or criminal responsibility for accidents; rather, the agency aims solely to advance transportation safety.

The history of the CARs process has shown that amendments can take months, if not years, to draft and implement. However, Fox said such a small detail should be "relatively easy... to implement."

But she said the industry has no excuse for further delay.

"Regardless of how long it takes the regulator to change the regulation, operators and passengers can change their practices today."



RotorBits



EASA CERTIFIES

SAFRAN ARDIDEN 1U

Safran Helicopter Engines has received European Aviation Safety Agency (EASA) type certification for its Ardiden 1U engine, installed in India's LUH (Light Utility Helicopter).

LUH is a new three-ton, single-engine, multi-purpose rotorcraft designed by Hindustan Aeronautics Ltd. (HAL). Since its first ground test in 2015, the Ardiden 1U maturation and certification campaign has accumulated around 1,000 of hours of operation, in test beds or in flight.

"The engine performs extremely well and has contributed to the success of the flight test campaign," said Benoit Gadefait, vice president of medium helicopter engines programs.

ASTRONAUTICS ROADRUNNER

EFI RECEIVES APPROVALS

Astronautics Corporation of America's AFI4700 RoadRunner Electronic Flight Instrument (EFI) has received Federal Aviation Administration Technical Standard Order authorization and a supplemental type certificate (STC) for the Leonardo AW109 and AW119 helicopters. It has also secured STC bilateral agreements with the European Union Aviation Safety Agency and Brazil's Agência Nacional de Aviação Civil.

Astronautics is working with certification agencies for additional STCs by platform, with the Bell 212 and 412 targeted for approval by January 2020.

RoadRunner EFI offers an EFI display upgrade that Astronautics said reduces maintenance costs and the liability of legacy display systems. Its "two-in-one," nextgeneration, 4×7-inch display replaces fiveinch electromechanical attitude director and horizontal situation indicators, as well as legacy cathode-ray tube EFI systems. Sikorsky saw a decrease in net sales in the third quarter of 2019 compared to the same period of 2018, primarily in Black Hawk and mission system programs. **Shawn Evans Photo**

SIKORSKY REPORTS Q3 DROP IN NET SALES

BY DAN PARSONS

Sikorsky saw a \$160 million drop in its net sales in the third quarter, compared to the third quarter of 2018, due mostly to decreased movement of helicopters, according to a recent earnings report from parent company Lockheed Martin.

The U.S. defense contractor's Rotary and Mission Systems (RMS) business, which includes Sikorsky, saw a \$139million decrease in sales for the quarter "primarily attributable to lower net sales . . . for Sikorsky helicopter programs due to lower volume (primarily Black Hawk production and mission systems programs)," Lockheed said in a press release that accompanied its regular quarterly sales call.

The decrease was offset by an increase of \$40 million in other segments within RMS, grouped under the weighty acronym C6ISR (command, control, communications, computers, cyber, combat systems, intelligence, surveillance, and reconnaissance). Other than Sikorsky, RMS is somewhat of a catch-all division within Lockheed that includes avionics, mission systems, sensor development, training and logistics systems and radars.

Still, Lockheed chief executive Marillyn Hewson was bullish about a relative wealth of helicopter programs that are nearing production and should boost Sikorsky's profits over the next decade. The company is on contract to build the massive CH-53K for the U.S Marine Corps, the U.S. Air Force's new Combat Rescue Helicopter and the VH-92 U.S. presidential helicopter replacement.

"In Rotary and Mission Systems, our Sikorsky team completed an extensive set of testing for our Combat Rescue Helicopter to successfully achieve the milestone C decision, moving the program into the low rate initial production phase of the contract," Hewson said during the earnings call. "The joint Sikorsky and U.S. Air Force test team executed over 70 hours of envelope expansion, validating the modifications to the venerable Black Hawk platform, that will allow it to perform its important search-and-rescue mission." The U.S. Air Force program of record is for 113 helicopters with five aircraft currently in various stages of production, she said.

Ramping up production of the F-35 Joint Strike Fighter is Lockheed's priority for the next decade and should drive most of the company's projected five percent growth, Hewson said. Sikorsky also has a pony in the race for the Army's Future Attack Reconnaissance Aircraft (FARA) that will fill the armed scout role vacated by the now retired OH-58D Kiowa Warrior and the Future Long-Range Assault Aircraft (FLRAA), both of which represent juicy growth opportunities.

"When you look at the growth for the company, F-35, of course is going to be our major element of growth for the next five to 10 years," Hewson said. "We know that from ramping up production sustainment of it, than the aircraft. But in addition to that, when you look at [the] Sikorsky CH-53K, the Combat Rescue Helicopter, even the presidential helicopter — all programs that will be into production and our platforms for us going forward. Future Vertical Lift is another area."

DART AEROSPACE MAKES MAJOR ACQUISITIONS

DART Aerospace has completed two major acquisitions, growing its portfolio of supplemental type certificates (STCs) from over 900 to more than 1,100. The Hawkesbury, Ontario-based company acquired aerial firefighting mission equipment manufacturer Simplex Aerospace in early October, and later that month announced it had also acquired key product lines from Canadian helicopter mission equipment manufacturer Aero Design Ltd.

Based in Portland, Oregon, Simplex Aerospace serves thousands of operators and OEMs worldwide. Its reputation for innovation, manufacturing and certification of aerial application systems has been built over a 73-year history.

The new combined entity will transition into operating under the DART brand.

DART said its acquisition of Simplex Aerospace will also allow the Canadianbased mission equipment manufacturer to broaden and diversify its firefighting product portfolio.

"With the support of Simplex's 200plus international product certifications and its years of experience in the aerial firefighting sector, DART will strengthen its global leadership position by providing helicopter mission equipment for offshore, firefighting and utility applications," said Alain Madore, DART's president and CEO.

"We are proud to be delivering the added value that Simplex's products and capabilities will bring to the DART brand," said Mark Zimmerman, president and CEO of Simplex, who led the company for 18 years. "Together, our unique STC portfolio and complementary product lines will enable us to achieve revenue synergies and expand our reach across the aerial firefighting sector worldwide."

In the second transaction, DART acquired product lines from Powell River, British Columbia-based Aero Design Ltd, as well as its brand trademark.

Aero Design has been developing and manufacturing aerial cargo expansion products since 1999, and has created an extensive catalogue of helicopter baskets, steps, bearpaws and bicycle racks for a wide range of OEMs including Airbus, Bell, MD Helicopters and Robinson.

Dart said the addition of the product lines from Aero Design will allow it to deepen its product offering, adding over 30 supplemental type certificates (STCs), as well as allowing DART to optimize its current Canadian operational capabilities.

"Acquiring Aero Design's key product lines will enable DART to offer baskets to a wider range of aircraft models and gain market share as the main provider of helicopter cargo expansion products worldwide," said Madore. "Alongside our current aerial utility and heli-ski product offering, we are also looking forward to furthering our footprint in the adventure tourism sector with the addition of Aero Design's helicopter bicycle racks."

Jason Rekve, Aero Design's president and general manager, said: "It is important to adjust our strategies and pool resources so we can help ensure that our industry meets the coming challenges as quickly and effectively as possible. I'm excited to see what comes next as we join the DART family and move forward together."

Jeff Clarke, vice president and quality assurance manager at Aero Design added: "This transition to DART is very positive as we have seen their desire to maintain our product lines and their plans to expand on them by integrating the best parts of both companies' capabilities. I am confident that Aero Design's current and past partners will continue to see the quality and features they have come to expect moving forward."

The terms of the transactions have not been not disclosed.



TSB AIMS TO REDUCE AIR TAXI RISKS



BY LISA GORDON

The Transportation Safety Board of Canada (TSB) released four targeted recommendations on Nov. 7 that aim to improve safety in the country's air taxi sector.

Despite a steadily improving safety record in Canadian commercial aviation, the air taxi segment — which includes aircraft and helicopters carrying fewer than 10 passengers by regulation — continues to have more accidents than all other sectors of Canadian commercial aviation combined.

In its report, entitled "Raising the bar on safety: Reducing the risks associated with air taxi operations in Canada," the TSB writes that the numbers speak for themselves.

"In the 18-year period from Jan. 1, 2000, to Dec. 31, 2017, there were 789 accidents in the air taxi sector, resulting in 240 fatalities — representing 55 percent of all accidents in commercial air services in Canada and 62 percent of the fatalities in this period."

The list of four recommendations stemming from the TSB report includes: eliminating the

acceptance of unsafe operational practices; promoting proactive safety management processes and a positive safety culture; closing identified safety gaps in existing aviation regulations; and improving the collection of data to help regulators evaluate the impact of safety-related recommendations.

UNIQUE OPERATIONS

Air taxi is an industry segment that provides critical services, including medevacs, passenger transport to hunting and fishing camps, delivering workers to remote locations, and service to small isolated communities. The TSB emphasized that companies in this aviation sector face a vastly different operating context compared to any other segment.

Often, these operators have no set schedules and fly into remote areas in uncontrolled airspace, with few aerodromes or navigation aids and sparse weather information.

"Flights tend to be shorter, resulting in more takeoffs and landings," pointed out TSB chair Kathy Fox during a media briefing that summarized the findings of the board's investigation. In compiling the report, the TSB studied more than 700 occurrences from 2000 to 2014, as well as 167 of its own investigation reports.

In addition, the board interviewed 125 people from almost three dozen operators across the country, as well as Transport Canada.

"After sifting through all those data, we identified 19 safety themes, illustrating the dayto-day challenges of operating in the air taxi sector," said Glen Whitney, the TSB investigator in charge of the air taxi inquiry.

"But these accidents really boil down to a pair of key underlying factors. First, a slow, incremental drift toward accepting unsafe practices . . . I'm talking about a gradual drift that occurs over time with every successful (though not necessarily safe) flight."

He pointed to examples such as flying overweight, proceeding despite marginal weather or forecasted icing, or flying with minimal fuel reserves.

The second factor compounds the first, said Whitney, pointing the finger at inadequate management of operational hazards. "Here, I mean things like sub-optimal crew pairing, dispatching a flight with a different pilot after a first pilot has refused, or not having scales available so that aircraft aren't flown overweight."

COMPETING PRESSURES

The TSB acknowledged that air taxi operators, like any business, must balance a number of competing pressures to remain viable. The key, said Whitney, is to ensure those pressures stay in relative balance.

When they're not in equilibrium, "competing pressures can force air taxi operations into a space that isn't safe," he added. "That doesn't mean the result is always an accident, but it almost always means a reduced margin of safety."

Fox told the media there will always be a need for air taxi operations and that passengers and crew should not have to accept a reduced level of safety compared to those who fly on scheduled airlines.

"And so, things need to change," she said. "That will mean getting clients, passengers, crews, and operators to stop accepting unsafe practices — even unwittingly — and to speak up to prevent them from happening

... That's what today's first recommendation is all about: raising the bar on safety."

She called upon Transport Canada to work with industry associations to develop tools and strategies to help combat these unsafe practices.

Associations also have a role in promoting a proactive safety culture through the provision of training and the sharing of information and best practices.

As well, the TSB is encouraging Transport Canada to close safety-related gaps in existing aviation regulations that allow some operators to get by with doing the bare minimum, while others go above and beyond.

Finally, the TSB is recommending that the regulator mandate all commercial operators to provide data on aircraft movements and hours flown. It says this will help in the calculation of accident rate per hour flown, a critical statistic to evaluate each aviation sector.

In addition to the four recommendations released on Nov. 7, the TSB also referred to 22 previous air taxi recommendations that it says would go a long way to improving sector safety if implemented.

When asked whether lower time, more inexperienced crews — many of whom work for air taxi operators — might be a contributing factor in the sector's higher accident rate, Fox said that isn't always the case.

"Studies show that many of these accidents were happening to crews with thousands of hours," she said. "Experience in itself doesn't mitigate against these types of accidents."

John McKenna, president and CEO of the Air Transport Association of Canada (ATAC), told *Vertical* the association is impressed with the TSB's examination of the air taxi sector. "ATAC considers this report to be an excellent primer and checklist for developing future safety enhancements for the air taxi industry," he wrote in an email. He said the association encourages voluntary adoption of safety programs and close collaboration with the regulator.

The TSB said it will communicate with Transport Canada, air taxi operators, clients and passengers, and industry associations to help them create "a culture where unsafe practices are unacceptable and operational hazards are adequately managed."



RotorBits

STANDARDAERO/ROBERTSON

CRFT CERTIFIED BY

TRANSPORT CANADA

StandardAero and Robertson Fuel Systems have announced the certification of their AS350/EC130 crash-resistant fuel tank (CRFT) by another international airworthiness authority, Transport Canada. This most recent approval represents the third regulatory agency to certify the system, following the U.S. Federal Aviation Administration and the European Union Aviation Safety Agency.

The CRFT features a durable composite material container that is strategically reinforced in the most susceptible areas to distribute impact loads in an accident.

"With nearly 600 AS350s flying in Canada, roughly 75 percent of which are legacy variants for which no other CRFS [crash-resistant fuel system] solution exists, there is a clear safety gap which we are intent on addressing, so we are extremely pleased to now have a certified solution in Canada to begin retrofitting these aircraft," said Elvis Moniz, StandardAero's vice president of business development for airframe and avionics solutions.



LEONARDO GROWS PRESENCE

Leonardo has signed a distributorship agreement with Absolute Aviation Group in South Africa for the civil and commercial market. The agreement includes the AW119Kx single engine, the AW109 GrandNew and AW109 Trekker light twins, the AW169 light intermediate, and the AW139 intermediate twin types.

Absolute Aviation Group has also signed a contract for an AW119Kx and an AW109 Trekker, with a commitment to purchase further units of the various models in the next couple of years. Deliveries of the two aircraft are expected in 2020.

ORDERS DOWN, BUT REVENUE UP FOR LEONARDO IN Q3

BY DAN PARSONS

Leonardo Helicopters continued to meet program targets in the third quarter of 2019, adding to parent company Leonardo's 11 percent growth to €9.1 billion (US\$10 billion) over the same period in 2018, according to the company's Nov. 7 earnings report.

Overall, Leonardo's orders were at €8.6 billion (US\$9.5 billion) in the third quarter this year, an 8.6 percent drop from the same period in 2018. The first nine months of 2019 saw €2.2 billion (US\$2.4 billion) in helicopter orders — primarily an NH90 buy by Spain, and Poland's purchase of the AW101. About €527 million (US\$582 million) of those orders came in the third quarter, according to Leonardo. That's down from €4.6 billion (US\$5 billion) in the first nine months of 2018, of which €3.3 billion (US\$3.6 billion) came in the third quarter, driven by a €3 billion (US\$3.3 billion) NH90 order from Qatar.

"The first nine months of 2019 are another important step forward on our journey: we are delivering consistently across our main businesses," CEO Alessandro Profumo said during a Nov. 7 earnings call. "We are reconfirming 2019 guidance. We are fully focused on executing our industrial plan aimed at value creation for all our stakeholders. We have been achieving this through successfully driving commercial momentum and top line growth, improving profitability, investing and building for a sustainable future, all with a disciplined financial strategy."

Despite the drop in orders, Leonardo Helicopters saw an increase in both revenue and profitability, compared to the same period of 2018, according to CFO Alessandra Genco.

Among the major new orders in the third

BLADE COMES TO INDIA

BY KP SANJEEV KUMAR

Bringing a small salve to India's problem of urban transportation, New York-based Blade is all set to commence operations in the country with Blade India, a joint venture between Blade and Indian investors Hunch Ventures.

Blade is an app-based flight aggregator that provides a software platform through which people can book charter flights on a pay per seat model. The company has been successfully running its operations in the United States, but its arrival in India could not have been more timely.

India — one of the fastest growing economies of the world — has less than 350 helicopters catering to a population of 1.3 billion. Distance and time spent on the road bear an uneasy relation. On any given day, one can see a number of helicopters holding private and non-scheduled operator's permits (NSOPs) parked at Mumbai's Juhu aerodrome, while millions deal with the ugly urban transportation problem outside its gates.

Helicopters servicing the offshore oil-andgas industry fly hundreds of sorties daily from the same aerodrome with hardly any capacity to spare for urban air mobility, even for the customers who

can afford it. As per a 2017 estimate, the city of Mumbai alone accounts for over 57,000 high net-worth individuals (HNI) and 28 of the 119 billionaires in India. Although a few helicopters are owned and operated under the NSOP charter by billionaires, there has been no system in place to either add or tap spare capacity for a vertical mobility solution. Blade India plans to bridge this "friction" between city pairs, while providing an end-to-end travel experience.

Pune and Mumbai, rated by *Forbes* Magazine as two of world's most congested cities, fall on one such route. Blade co-founder Rob Wiesenthal believes that Blade India's app-based service will cut down the six-hour drive from Mumbai's Mahalakshmi Race Course or Juhu heliport to Pune into a 30-minute aerial hop.

Other featured destinations on its website include Mumbai-Shirdi (a highly frequented religious destination) and Pune-Shirdi, available Monday through Saturday from sunrise to sunset. At press time, news reports were indicating that Blade's India quarter of 2019 were 23 NH90 tactical helicopters bought by the Spanish Ministry of Defence and the sale of four AW101 multi-purpose naval helicopters to the Polish Ministry of Defence. The helicopter business also saw jumps in orders for customer support and training services, she said.

A total of 91 new helicopters were delivered in September 2019 compared to 113 deliveries over the same period of 2018, while revenues rose from \in 826 million (US\$912 million) in the third quarter 2018 to \in 841 million (US\$929 million) in the same period this year.

"Revenues increased compared to September 2018 as a result of higher levels of activity on both governmental programs and customer support and training, which more than offset the lower deliveries of helicopters for civil customers," the company stated in a press release.

service would be launching in late November.

Capacity to meet demand, guaranteed availability of the service, air traffic congestion around Mumbai and regulatory permits to operate to locations hitherto inaccessible to charter helicopters are expected to present challenges in the near term. A helicopter shuttle connecting Bengaluru International Airport to the city by Thumby Aviation in 2018 and another by Deccan Aviation in 2008 faced stiff headwinds, which soon ran the services aground.

Blade, on the other hand, does not own or operate the helicopters in its service. Its website states that "the operators who own, manage, maintain and operate the helicopters have been specifically chosen to work with Blade India based on a consistent high level of safety standards, equipment maintenance programs, and conservative operating protocols. They have been vetted by third-party rotorcraft industry experts."

While India is yet to reap the full-spectrum benefits of vertical flight, if Blade's efforts succeed, it could trigger the beginning of a much-needed disruption in the country's urban air mobility space.





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VIRTUAL REALITY, FULL-MOTION SIMULATOR NOW IN SERVICE

BY THIERRY DUBOIS

VRMotion, a Swiss startup offering a virtual reality (VR) flight simulator, is working with the European Aviation Safety Agency (EASA) on new standards for such training devices while the company's launch customers have begun finding uses for the lower-cost technology.

VRMotion's product makes the most of VR to make full flight simulators affordable for small operators of single-piston engine helicopters. Meanwhile, it is retaining full-motion capabilities for maximum realism and to eventually gain formal approvals from civil aviation authorities.

VR goggles replace the conventional dome for image display. The system's weight is thus drastically cut to 440 pounds (200 kilograms), from 10 metric tons, according to VRMotion. In turn, the motion platform can be actuated more dynamically to increase the degree of realism — the angular velocity is up to five times higher, said VRMotion CEO Fabi Riesen.

Installing the simulator no longer requires a vast hangar. Riesen would not quote a price, however.

In front of the student pilot, the cockpit's shape, with display contours, buttons and knobs (not shown on the photo), adds the haptic aspect and enables interaction via the VR system.

The house-developed "pose tracking"

system enables avatar animation following the pilot's movements. Key points on the body are tracked in real time with enough precision to accurately handle the controls, avionics and other cockpit systems, said Riesen.

Force feedback on the controls and the motion platform is said to be precise enough to make the pilot feel vibration from main rotor blades and interaction with uneven ground.

Many helicopter accidents happen with small light aircraft, and Riesen hopes his simulator will help solve this industry-wide problem.

Bern, Switzerland-based flying school Mountainflyers has incorporated a VRMotion device in its pilot training program. "Students can practice special flight maneuvers and dangerous situations on the ground without any risk, which gives them the necessary routine that will make them safer in the air," said CEO Christoph Graf.

A student pilot can hover during his or her first flight after eight hours on the simulator, according to Riesen. A private pilot license is obtained in an average 60 flight hours, he said. The required minimum is 45 hours. "The remaining average 15 hours could be spent on the simulator," he suggested.

Mountainflyers has tried a new business model — unlimited access to the simulator, at no additional cost, until the students obtain their private helicopter license.

VRMotion's device is available for the Robinson R22 and the H125 (for simulated



VRMotion claims that after spending eight hours on its simulator, a student pilot can hover during his or her first flight in a real aircraft. **VRMotion Photo**

sling load operations). Next in line is the Kopter SH09.

EASA is in the process of creating rules to integrate new technologies, such as VR, on simulators. They could, potentially, allow training credits for using the device.

However, current training rules stipulate, for example, that the instructor and the student must be in the same cabin. The potential solution to meet this requirement might be virtual proximity. The instructor could be on a different platform, seeing the student's avatar in VR goggles.

In the future, features such as eye tracking may be added. This would enable the instructor to give the student exhaustive feedback after a simulated approach.



fleet to three aircraft. Helicopter Express Photo

KAMAN TO DELIVER K-MAX TO HELICOPTER EXPRESS

Kaman Aerospace is to deliver a new K-Max to Helicopter Express of Chamblee, Georgia. Helicopter Express currently operates 24 aircraft providing dedicated services in heavy lifting, utility construction, firefighting and disaster relief. Helicopter Express placed its order in May and will take delivery of its new K-Max in December 2019.

"Helicopter Express started in 1995 with the vision of building a versatile helicopter company that offers a broad range of services to the southeast and has continued to evolve and become trusted leaders in the industry," said Scott Runyan, founder and president/CEO of Helicopter Express. "Expanding our fleet with a third K-Max is an important step to tackle our clients' ever-changing needs."

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HAI NAMES WINNERS OF SALUTE TO EXCELLENCE AWARDS







Helicopter Association International (HAI) has revealed the winners of its annual Salute to Excellence Awards, which recognize outstanding achievements and significant contributions to the helicopter industry.

The 2020 Salute to Excellence Awards recipients include Jason Glynn, Corey Brekke, Krisna Dewi, Mark Ogden, and Gary Wiltrout. The awards will be presented at HAI's Salute to Excellence Awards luncheon at HAI Heli-Expo 2020 in Anaheim, California, on Jan. 29.

Jason Glynn, a pilot for Era Helicopters, is the winner of HAI's Pilot of the Year Award, which recognizes an outstanding single feat performed by a helicopter pilot during the year or extraordinary professionalism over a period of time.

Glynn's career includes having served as a flight instructor for Vortex Helicopters in Mississippi, followed by roles at Era Helicopters with increasing levels of responsibility.

However, Glynn didn't start out in the helicopter industry. First, he repaired diesel-engine generators on petroleum exploration platforms in the Gulf of Mexico. But after multiple helicopter flights, Glynn's



passion for aviation grew, and he decided flying helicopters was what he wanted to do for the rest of his career.

Glynn became more familiar with the helicopter industry while in a job performing base support at the Era heliport in Port Fourchon, Louisiana. Six months later, Glynn began putting himself through Vortex's flight school while still working as a ramp hand for Era. He impressed the school's instructors, examiners, and owner, who offered Glynn a job as a flight instructor upon his graduation.

After his time as a flight instructor at Vortex, Glynn had flown nearly 920 hours, making him eligible to become a copilot at Era. Throughout this period, his inspiring attitude and work ethic prompted unsolicited recommendations from almost every senior captain at the company. This led him to a position with the company as a copilot of a Sikorsky S-76 helicopter.

Throughout his 16 years at Era, Glynn has continued to excel, quickly moving through the ranks of instrument flight rules second-in-command (IFR SIC) to visual flight rules (VFR) captain to IFR captain. His work ethic, dedication to aviation



The HAI Salute to Excellence Awards winners include (clockwise from top left): Jason Glynn (Pilot of the Year), Krisna Dewi (Safety), Gary Wiltrout (Lifetime Achievement), Mark Ogden (Excellence in Communication), and Corey Brekke (Excellence in Helicopter Maintenance).

safety, and strong desire for positive industry change drew him into a management role at the company. Over the years, Glynn has served as base lead pilot, assistant chief pilot, assistant director of operations, S-76/EC225 check airman, operations manager and is now director of operations.

Corey Brekke, maintenance manager in Afghanistan for Columbia Helicopters, is the 2020 recipient of HAI's Excellence in Helicopter Maintenance Award. The award, sponsored by Rolls-Royce, recognizes an individual for long-standing excellence in the performance of helicopter maintenance, maintenance instruction or supervision, or a single significant and distinct contribution to helicopter maintenance.

Brekke began his aviation career in Montana, where he obtained his airframe and powerplant license in 1991. Subsequently, he worked for eight years in the South Pacific on a 350-foot tuna boat, where he was the only aircraft mechanic onboard, maintaining a Hughes 500.

In the spring of 2000, Brekke accepted a job with Columbia Helicopters. After only five days on the job, he departed to work in Alaska as the fourth man on a logging crew working on a Columbia Model 107-II Vertol.

Recognized early on for his work ethic, ability to get along with and lead a crew, reliability, and technical knowledge, Brekke advanced to the position of assistant crew chief in just a year and then to crew chief in 2003. Brekke also forecasts maintenance and logistical needs to support the aircraft during high-utilization periods. His ability to troubleshoot problems and innate desire to get to the root of a technical issue is well known to those who work with him.

In 2011, Columbia received a contract to support Operation Enduring Freedom in Afghanistan, delivering four Vertol 107-IIs and a 234 Chinook. Brekke had started working as senior crew chief on the contract when it became clear Columbia needed someone in-country who had the knowledge, skills, and experience to lead a team that would meet the stringent operational readiness rate the military required. Brekke's extensive operational and maintenance experience led him to being promoted to Afghanistan maintenance supervisor.

Columbia promoted Brekke to Afghanistan maintenance manager in 2018. The new role required him to focus heavily on managing maintenance resources to support the military's missions. Instead of using traditional small maintenance teams assigned to specific aircraft, Brekke transitioned the teams to shift work resembling that of an airline, a change that required some team members to work 4 a.m. to 4 p.m. shifts in support of daily flight operations. The remaining mechanics work the night shift, performing aircraft inspections, repairs, and component changes, among other tasks. These actions enable all 12 Columbia aircraft to be fully mission capable each day.

Today, Brekke continues to look for new ways to improve and serve. Because of his dedication and leadership, Columbia has been able to maintain its operational readiness rate while providing reliable service to U.S. and NATO troops after more than 118,000 flight hours.

Krisna Dewi, commercial manager of PT. Sayap Garuda Indah (Heli SGI and Air Bali) in Bali, Indonesia, is the 2020 recipient of the association's Safety Award. The award, sponsored by BLR Aerospace, acknowledges outstanding contributions in the promotion of safety and safety awareness throughout the international helicopter community.

Dewi is receiving the Safety Award in recognition of her promotion of a business model that places safety above all other business elements, including profit. Her advocacy and determination to prioritize safety in the company's operations has also resulted in increased business for her company during a period when Indonesia's helicopter industry experienced low or negative growth. In 2014, at the height of the downturn in helicopter support for offshore drilling and amid uncertainty in Indonesia's resource industry, Heli SGI was facing a shaky future. In a bid to turn things around, the company brought in an industry expert, Ronnie Fahy, to provide guidance. As part of the process, Fahy interviewed the company's employees; Dewi stood out because of her vision and plan to move the company forward.

Dewi had witnessed other operators reducing expenses, including safety standards, in order to offer lower prices to customers. Her plan mandated putting safety and quality above all else and charging accordingly. Her idea also included choosing to work only for clients who understood the business model and were willing to pay for a safety- and quality-first approach.

In an administrative role when Heli SGI's reorganization began, Dewi was quickly promoted to commercial manager. She focused on her goal to turn around Heli SGI by providing higher levels of safety and quality than its competitors.

The return on Heli SGI's investment in safety is clear. When Dewi received her promotion in 2014, Heli SGI was operating on one contract flying 60 hours a month. Today, in part because of her work in the past five years, the company operates 12 helicopters on contract, flies 600 to 800 hours a month, and has several long-term contracts with large mining companies. Now, other operators are adopting the Heli SGI safety-first model.

Mark Ogden, editor of *HeliOps* magazine, is the 2020 winner of HAI's Salute to Excellence Lightspeed Aviation Excellence in Communications Award. The award recognizes the individual or organization achieving the most creative and distinct dissemination of information about the helicopter industry.

Ogden has been editor of the *HeliOps* (civil helicopters), *HeliOps Frontline* (military helicopters), and *Air Attack* (aerial firefighting) magazines for the New Zealand-based Kia Kaha Media Group for the past 20 years. Ogden, who highlights issues that affect the global rotorcraft industry, is known for his respected, hard-hitting editorials, which provide a focused analysis of the industry in each issue of all three magazines.

Ogden is also a prolific technical writer, having contributed to various safety documents and manuals. His writing has ranged from company profiles and industry analyses to pilot reports to articles on aviation safety and helicopter flying techniques, as well as safety alerts for the Aviation Safety Network. Additionally, Ogden is a skilled helicopter photographer who has shared with his readers many years' worth of his work.

Gary Wiltrout, a Boise, Idaho, resident, is the 2020 recipient of the Salute to Excellence Lifetime Achievement Award. This award, presented by Bell, salutes excellence in management and leadership and is given to an individual for long and significant service to the international helicopter community.

Wiltrout has flown helicopters around the world during a 50-plus year career in aviation. He first flew for the U.S. Army, transporting troops in and out of battle in Vietnam in 1968 to '69. Afterward, he served as a flight instructor at Fort Rucker, Alabama.

After being honorably discharged from the Army in 1971 having flown 2,000 accident-free hours, Wiltrout moved to Alaska and began flying firefighting missions, followed by assisting with the construction of the Trans-Alaska Pipeline System. While living and working in the state, Wiltrout also conducted search-and-rescue missions, aircraft accident investigations, seismographic work, and powerline construction.

In 1999, Wiltrout became chief pilot for Salmon River Helicopters in Riggins, Idaho, where he worked 20 years before recently retiring. During his career with many different companies, he flew more than 26,500 flight hours in helicopters, more than 20,000 of them while conducting longline, external-load missions.

Wiltrout flew multiple models of helicopters during his career, including the Bell 47; the Bell UH-1A/B/C/F/H models; the Bell 206A/B models; the Bell 204, 212, and 214B models; the Fairchild Hiller FH-1100; and the Sikorsky S-61 and S-64E/F models, among others.

Wiltrout has survived three aircraft accidents — including two catastrophic engine failures — and the death of his pilot brother Timothy Wiltrout in 1990. In each case, with his family's support, he has persevered and continued working in the industry.

Today, Wiltrout remains a mentor to many, especially new pilots.

VFS STUDENT DESIGN COMPETITION TO INSPIRE VERTICAL INNOVATION



This was the winning entry in the graduate category of the 2018-2019 VFS Student Design Competition. The University of Maryland's "Caladrius" was designed to rescue climbers from the top of Mount Everest. **UMD Image**

BY KEN SWARTZ

Since 1984, the Vertical Flight Society (formerly the American Helicopter Society) has held its annual student design competition to challenge future rotorcraft designers with projects that stretch their imagination and their skills; many seem outlandish or improbable at first, but they have often been ahead of their time.

The VFS competition is sponsored (in rotation) by the five major helicopter manufacturers (Airbus, Bell, Boeing, Leonardo and Sikorsky) and government agencies like NASA and the U.S. Army.

Last year's Airbus-sponsored competition was for an "Extreme Altitude Mountain Rescue Vehicle," which challenged students to design a rotorcraft to perform emergency medical services on the highest mountain peaks in the world.

Since this year's competition falls on the 500th anniversary of Leonardo da Vinci's death, sponsor Leonardo Helicopters has conceived a tough, out-of-the-box challenge that applies the technologies of today to the innovations of the past for potential applications tomorrow.

AERIAL SCREW

Da Vinci was a Renaissance artist and inventor who had many innovative ideas that were far ahead of his time.

One was the famous late 15th century drawing of the aerial screw, which together with

a few lines of text describing the working principle, depicted the first technical concept for a vertical takeoff and landing (VTOL) vehicle and is considered the first heavierthan-air VTOL aircraft design in history.

Titled "Leonardo's Aerial Screw: 500 Years Later," the VFS competition challenges student teams to design a VTOL vehicle based on da Vinci's aerial screw concept, studying and demonstrating the physics behind his design and its potential feasibility.

The actual pros and cons of the aerial screw are often quoted but have not been analyzed extensively — nor has a possible working application been studied — which leaves a wide gap in the technical understanding of da Vinci's invention.

Teams are required to design a vehicle that relies on one or more "aerial screws" (i.e. single-blade rotors with a continuous surface that wraps around itself like an actual screw) for vertical lift.

The design must be capable of lifting one 132-pound (60-kilogram) person with a vertical takeoff and landing, and fly for at least one minute at a height of three feet (one meter) or more above the ground to a distance of at least 65 feet (20 meters).

The students must conduct a conceptual study of all required systems, including aerodynamics, structures, powerplant, rotor, controls, etc., based on existing technologies and equipment. Although the point is not to build an aircraft, the preliminary capability and performance of the VTOL aircraft must be defined and validated.

Graduate students also have to conduct a deeper technological investigation of key elements of the aerial screw concept, including an assessment of structural stress levels. The objective is to demonstrate that the developed conceptual design could actually be tested on a real demonstrator aircraft.

Leonardo is providing more than \$12,000 in prizes. In addition, Advanced Rotorcraft Technology, Inc. of Sunnyvale, California, is sponsoring a flight simulation optional bonus task with an additional \$1,000 each in prize money available for a winning graduate and undergraduate team.

Letters of intent from participating teams are due by Feb. 3, 2020, and final submissions are due no later than May 31, 2020.

INDUSTRY BENEFITS

Luca Medici, head of aircraft system integration at Leonardo Helicopters said that many achievements in vertical flight are the product of strong collaboration between industry, academia and the research world, and that student competitions help prepare young engineers to innovate.

"Students, stimulated and properly guided, are the seeds of the growth we are looking for," said Medici, adding that the competition will help students develop their analytical, problem solving and management skills while working on a complex vertical flight aircraft design prior to graduation.

VFS executive director Mike Hirschberg said that many previous participants in the competition now occupy senior engineering positions in academia, government and industry (including the emerging electric VTOL industry), and the student designs have often foreshadowed future VTOL concepts.

Hirschberg said that few of today's engineers were trained to design drones or electric VTOL aircraft or extra-terrestrial rotorcraft (like NASA's Mars Helicopter). The annual VFS competition will require them to apply their knowledge, skills and ingenuity to solve new challenges, he said, adding that "this year's competition provides a new twist that students have never seen before. We're excited to see what they come up with!"

AIR GREENLAND SELECTS H225 FOR SAR

Air Greenland has ordered two Airbus H225 heavy helicopters to support its bid to win its home country's searchand-rescue (SAR) contract.

Under the terms of a firm contract assisted by Airbus Helicopters, two H225s repurposed from the oil-andgas industry will be delivered over the coming months to replace the aging Sikorsky S-61 helicopter currently used for the service.

Airbus will provide a comprehensive maintenance and support package as well as pilot and crew training.

"These two specific aircraft have low numbers of flight hours and their remarkable capability on SAR operations ensures that they will be able to provide a highly effective service in that role for many years to come," said Air Greenland CEO Jacob Nitter Sørensen.



An Airbus H225 Super Puma shown in the search-and-rescue role. Airbus Helicopters Photo

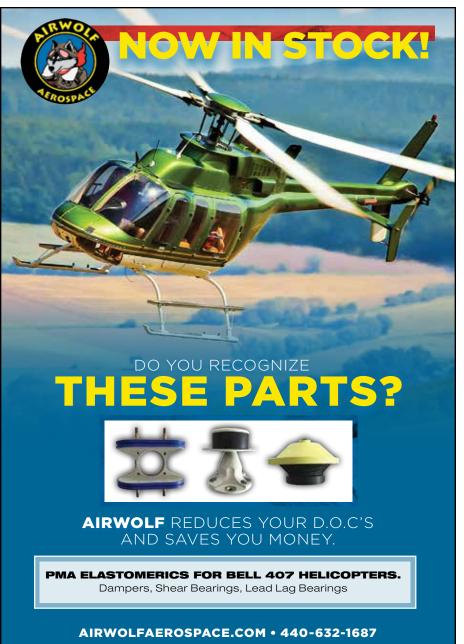
H125 FULL FLIGHT SIMULATOR QUALIFIED BY EASA



U.S.-German cooperation between TRU Simulation + Training and Reiser Simulation and Training has resulted in European Aviation Safety Agency (EASA) Level D qualification of the H125 full flight simulator (FFS) at Coptersafety in Helsinki, Finland.

TRU's Odyssey H mothership together with Reiser's H125 cockpit module, flight dynamics and avionics software make it the world's newest H125 helicopter simulator to receive Level D certification, being built on Reiser's own flight data and replicated hardware.

"This certification of the H125 project is an example of a very successful cooperation between two world-class simulator companies — one in the U.S. [and] the other in Germany — the operator, Coptersafety, and the Finnish Regulatory Authority, testament to what can be achieved if organizations are committed to excellence," said Reiser's CEO, Dr. Roman Sperl.



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AEROBRIGHAM NOW A HELIWAGON DISTRIBUTOR

Heliwagon has announced a distributor agreement with aircraft completions and maintenance company AeroBrigham.

Based in Waco, Texas, Heliwagon is the provider of a remote-controlled landing dolly for helicopters, which eliminates the need for tugs and tows. The Heliwagon features a wireless range of 500 feet (150 meters), and can be controlled from inside or outside the helicopter.

As part of its new



president of Heliwagon; and David Brigham, president of AeroBrigham; Brad Selbold, president of Heliwagon; and David Brigham, president of AeroBrigham, celebrate the new partnership at AMTC 2019. **Dayna Fedy Photo**

partnership with Heliwagon, AeroBrigham will have a Heliwagon platform — with a custom AeroBrigham logo — at its Decatur, Texas, facility to demonstrate to its customers, offering them the chance to operate the platform with a helicopter on it.

"We chose AeroBrigham because of their success and dedication to customers and customer service," said Brad Seibold, president of Heliwagon. "We see a company succeed, and that's a company we want to partner with because they know how to take care of their customers."

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ALPINE AEROTECH DEVELOPS DIGITAL FLIGHT INSTRUMENT KIT

Alpine Aerotech has secured a Transport Canada supplemental type certificate (STC) for its cost-effective digital flight instrument kit applicable to Bell 212 day/night visual flight rules (VFR) operations.

The digital flight instrument kit is specifically designed to replace expensive, unreliable heading and attitude indicators with robust digital versions that have no moving parts to wear out.

In addition to the former analog attitude and heading gauges, the installer can also remove the tarsyn/rate gyros, flux valve, remote compensator, compass control, and all associated wiring leaving less components to fail in service. The kit also includes all installation provisions to create a near plug and play solution that requires only minor structural modifications, Alpine Aerotech said.

AERO DYNAMIX BELL 505 NVG LIGHTING MODS RECEIVE STC



Aero Dynamix Inc. (ADI) has received Transport Canada validation and a supplemental type certificate (STC) for night vision compatible lighting modifications on the Bell 505 platform.

"Earlier this year, ADI received our FAA STC approval on the [Bell] 505; we continue to pursue and obtain foreign validations to support our customers' needs and demonstrate our team's expertise with their working knowledge of foreign regulatory agencies," said Tonka Hufford, ADI's chief operating officer.

RotorBits



AIR CENTER SIGNS HCARE SMART CONTRACT FOR H225s

Air Center Helicopters, Inc (ACHI) has signed a set of HCare Smart parts-by-thehour contracts for 10 of its Airbus H225 helicopters. These aircraft are currently in operation with the U.S. Armed Forces for passenger transport, Special Operations Forces training, vertical replenishment and casualty evacuation missions.

The HCare Smart contracts cover a threeyear period and have been customized to meet the material support and spare parts requirements of helicopters flying in demanding theaters of operation, including a dedicated spare parts consignment stock. With this contract, 10 of the 17 H225s in ACHI's fleet are now covered by HCare.

ACHI's remaining seven H225s are currently undergoing retrofit for their new missions and are expected to all enter operation by March 2020. As of today, around 55 former oil-and-gas H225s have been reconfigured for aerial work, utility, firefighting and search-and-rescue.

LCI LAUNCHES FIRST

HELICOPTER CO-INVESTMENT

Helicopter leasing company LCI has launched its first-ever helicopter co-investment vehicle.

The new helicopter ownership vehicle contains five aircraft all on long-term lease – three Leonardo AW139s and two Sikorsky S-92 units – and is valued at over \$100 million. It has been launched in partnership with Flexam Tangible Asset Income Fund (part of Flexam Invest Group), which has also contributed to the capitalization. LCI will also act as servicer for the vehicle.

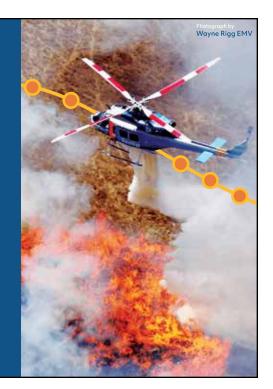
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FAA CERTIFIES SIMPLEX INTERNAL FIRE ATTACK

SYSTEM FOR BLACK HAWK

Simplex has received Federal Aviation Administration (FAA) approval for the Approved Models List (AML) extension of its supplemental type certificate (STC). This certification applies to the Sikorsky UH-60/S-70 Black Hawk's Simplex Model 370i Internal Fire Attack System (FAS). This AML extension adds 11 eligible UH-60/S-70 type certificates (TCs) to the existing STC, bringing the total to 12 UH-60/S-70 TCs that are now approved for operation with the Simplex Model 370i FAS.

The Model 370i, originally certified for installation and operation on the Timberline Helicopters Inc. TC, is the first and only FAA certified internal FAS for the Black Hawk helicopter, Simplex said. The system was developed primarily for restricted category civil aerial firefighting operators and requires no modifications to the aircraft structure.

BRISTOW GROUP EMERGES FROM CHAPTER 11



On Nov. 1, Bristow Group Inc. announced that it had emerged from Chapter 11 bankruptcy protection, having successfully completed its debt restructuring process and implemented the Chapter 11 reorganization plan confirmed by the U.S. Bankruptcy Court for the Southern District of Texas on Oct. 4, 2019.

Bristow said it has reduced its debt "significantly" and is emerging with \$535 million of new capital, which it believes will provide significant financial flexibility to support its global operations. The company also announced it has amended and reinstated its \$75 million term loan as of its emergence.

"We are beginning this new chapter of Bristow's proud history having achieved our key restructuring goals: a stronger balance sheet and improved liquidity that will enable us to continue providing industry-leading service to our global client base," said L. Don Miller, president and chief executive officer of Bristow. "I would like to commend our global team for its unwavering focus on delivering safe and efficient service to our clients and passengers as we navigated the restructuring process."

RotorBits



OUTERLINK INTRODUCES

Outerlink has developed a web-based system to automate and simplify the process of collecting and understanding aircraft data. The company recently launched a cloud-based flight analytics system for its IRIS platform, a combined voice, video and flight data monitoring system.

The cloud service, which is available to new and existing customers, provides IRIS users access to critical fleet data from a virtual workspace. The system organizes pre-defined events in easily digestible formats, allowing operators and safety managers the ability to laser focus on the most important data points. That data can then be used to identify trends and training opportunities, which ultimately leads to safer operations. Outerlink said the cloud offers more flexibility and scalability to users on a system already designed to adapt to industry changes.

SAFRAN AND AECC

STRENGTHEN TIES ON WZ16

Safran and Aero Engine Corporation of China (AECC) have signed a memorandum of agreement to strengthen their industrial cooperation on the WZ16 French-Chinese helicopter engine.

The WZ16 is jointly developed and built by Safran Helicopter Engines and AECC, and was certified in china on Oct. 10, 2019. The engine is installed in the AVIC AC352 helicopter.

Through the memorandum, the two companies have agreed to study the opportunity for a joint venture in China to support and maintain in-service WZ16s; prepare and launch a production ramp-up of the WZ16 to deliver a first order of 120 engines and discuss the opportunity for 100 additional units; and discuss new applications for the WZ16, including a turboprop variant for fixed-wing aircraft.



TISCHLER SELECTED FOR

VFS 2020 NIKOLSKY

LECTURESHIP

U.S. Army Senior Scientist Dr. Mark B. Tischler has been selected for the Vertical Flight Society's prestigious 2020 Alexander A. Nikolsky Honorary Lectureship. The Lectureship is awarded to "an individual who has a highly distinguished career in vertical flight aircraft research and development and is skilled at communicating technical knowledge and experience."

This, the 40th Annual Nikolsky Lecture, is entitled, "Flight Control Challenges and Technologies for Future Rotorcraft." In his lecture and the accompanying in-depth article, Tischler will articulate his vision based on his vast expertise in aircraft system identification, flight control, handling qualities and simulation.

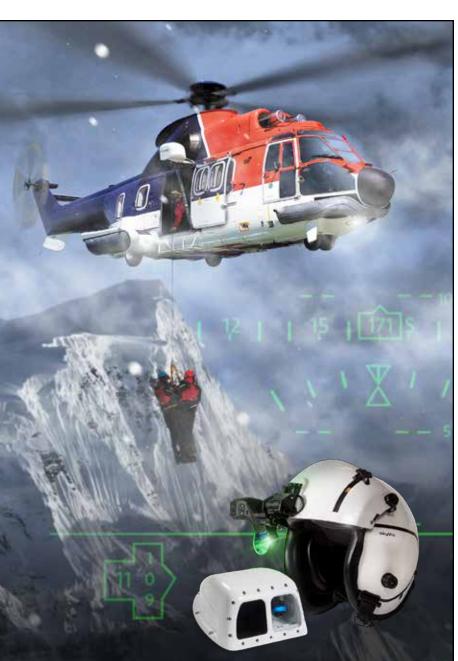
Tischler will present the Nikolsky Lecture at the VFS's 76th Annual Forum & Technology Display, on May 19, 2020, at the Palais des congrès de Montréal in Montreal, Quebec.

SIKORSKY S-76D PROVING VALUE IN GUYANA OFFSHORE OPERATIONS

National Helicopter Services Ltd., a leading Sikorsky S-76 helicopter operator, is expanding operations with its first two S-76D aircraft in Guyana. NHSL has operated Sikorsky helicopters for nearly 40 years, providing offshore transport services to the oil-and-gas sector and other commercial entities, as well as government services for emergency and natural disaster response.

"The demanding pace and environments in which we operate speak to the S-76's value, reliability and performance," said Capt. Homer Solomon, the Trinidad-Tobago-based NHSL director of operations. "We are proud to be the launch operator of the S-76D in Guyana, and we value the aircraft's noticeably lesser fuel burn, quieter cabin, lower vibration levels and cost-effectiveness for our operations."

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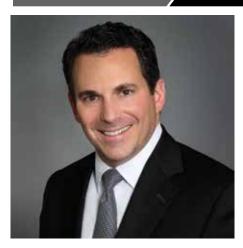








terviewed by Oliver Johnson



CHRIS BRADSHAW

Chris Bradshaw has served as president and CEO of Era Group since November 2014. Prior to joining the operator in 2012, he worked as an investment banker and co-founded an independent financial advisory firm.

VERTICAL: It's obviously been a very challenging few years for the offshore helicopter transport sector. What has Era done differently that has helped it endure when other offshore operators have had to file for Chapter 11 bankruptcy protection?

CHRIS BRADSHAW: I think we were very proactive in addressing our cost structure at the early stages of the downturn. In late 2014, we completed an internal reorganization of the company, which significantly reduced our costs. Unfortunately, a lot of those cost reductions were headcount, and it's always difficult to take out jobs and positions. But we did have a view about what market conditions were likely to be like, and we thought we needed to go ahead and adjust our cost structure for the new reality in the market.

Over the course of the downturn we reduced our overall headcounts by approximately 45 percent, including a 55 percent reduction in fixed, or G&A headcount positions. And then we pursued a strategy of, first of all, maintaining the highest safety standards. Second, maximizing the utilization of our helicopter fleet. Third, realizing cost synergies wherever possible. And fourth, protecting our balance sheet. As we continued to generate free cashflow, which we are able to do because of the cost reductions, we used that cash, as well as cash that was generated from the sale of underutilized helicopters, to pay down debt. Those actions have allowed us to maintain a strong business and a strong balance sheet now almost five years into the downturn.

V: So how large is the company's staff and fleet now? Are you operating any Super Pumas?

C.B.: We have 105 helicopters and approximately 650 employees globally. We have just one H225, which is currently in long-term preservation in Norway.

V: How do you view the offshore industry today?

C.B.: Well, on the positive side, we do think that the offshore oil-and-gas market recovery has begun. We think it is going to be a gradual one, not a dramatic hockey-stick-like recovery. But we are seeing gradual improvements in the market, which is encouraging.

V: Is that just in the amount of exploration work?

C.B.: That's right. There are more dollars being spent offshore, more rigs that are going back to work driving an increase, albeit a gradual one, in the need for helicopters to support those offshore operations. I think that's the positive that we're seeing in the market fundamentals. On the negative side, the market is unfortunately much smaller than it was prior to the downturn. Now we're in a position where there's an excess amount of equipment, particularly of the heavy helicopters, there's an excess amount of operators, and there's an excess amount of leasing companies. The overcapacity is resulting in a continued very challenging industry environment, where really no one is earning a premium to their cost of capital, which of course is an unsustainable situation over the long run.

V: And that's what's driven some of these Chapter 11 cases?

C.B.: Yes, I think that's a big part of it. It's also one of the fundamental reasons we believe that consolidation is needed to address the challenges that exist in the industry. It's necessary to address some of the overcapacity that exists in the industry and to achieve better absorption of the significant fixed costs that are required to run an air carrier.

V: You made a call for industry consolidation quite publicly earlier this year.

What sort of feedback did you have following that?

C.B.: Almost all of the conversations that I've had with various industry participants, whether it's competitor operators, leasing companies, OEM conversations — I think people generally agree that there needs to be some consolidation in the industry to get us to a place that's more sustainable. I think it's really important for our customers as well, because at some point we and all of our fellow operators are going to need to replenish our helicopter fleets. It's just a matter of time before capital will be required and the customers are going to want access to the latest generation, most sophisticated equipment with the best safety features.

I think if you have an industry that has perpetually failed to earn a premium over its cost of capital, then the capital providers are not going to be willing to commit the capital dollars that are required to take actions like replenishing your helicopter fleet. I think it's in everyone's interests, including our customers, that we get to a situation where the industry is more sustainable.

V: Would it be fair to say that Era's had conversations with CHC or Bristow about how this consolidation might play out?

C.B.: I don't want to mention any specific opportunity, or conversation, but I would note that this is something we've been actively pursuing. I think there are a number of people in the industry who recognize a similar dynamic and are actively pursuing opportunities to effect some of the consolidation that the industry needs.

V: Do you foresee the fleet replenishment you've talked about being in the form of super mediums? Is there still a market for the big heavies?

C.B.: We do think there will continue to be a market for aircraft such as the Sikorsky S-92, because if you're a certain distance offshore, that is still going to be the best, most efficient lift solution for those long-distance missions. We are optimistic about the future of models like the Leonardo AW189. We think the AW189 presents a very compelling value proposition for our customers and that it can do a lot of the missions that a traditional heavy did at a lower cost. The aircraft is about half the capital cost and about a third lower operating costs compared to a traditional heavy aircraft.

I would note that on the replenishment, at least for our fleet, this is not something that we need to do tomorrow, next year, or the year after that. I think we're in a good position now with our fleet to service the market opportunities that are there. But eventually, we're all going to need to bring in new helicopters to replenish our fleets. And that's really only going to be possible if we can access capital, and accessing capital will only be possible if there's a track record that that capital will be rewarded.

V: Diversification seems to be a key part of Era's recent strategy. What have you been doing to bolster other parts of the business?

C.B.: We have signed a contract for a leading player in the commercial space industry to respond in the event that an unexpected incident occurs. This is a mission in our emergency response service line that's one of those situations where you hope your services are never needed, but the customer is paying us to be on standby.

We view this as an attractive growth and diversification opportunity since it is not tied to the oil-and-gas commodity cycle.

We've also signed another emergency response service contract in Suriname, to support the offshore oil-and-gas market activity in the country. So it's continued diversification for us geographically, which we like. The Suriname Guyana basin has been one of the relative bright spots in the offshore oil-andgas industry over the last five years.

V: What's the relationship been like with the OEMs through the downturn? Have they been doing enough to support the operators?

C.B.: I think it continues to be good. From our perspective, these are obviously extremely important relationships for us. They are long-term in nature and I think it's important that we have a partnership approach with the OEMs. The emphasis in recent years has been more on the support side, because obviously there are relatively few new helicopters that have been delivered in an offshore configuration over the last few years. I think the OEMs are motivated, as we are, to see the number of flight hours increase, but I'd like to see the installed base of helicopters out there today flying more. That's an important stage along the way to potential new helicopter orders down the road.

V: Era was announced as the launch customer of the Leonardo AW609 last year. Are you still expecting delivery of the first aircraft in 2020?

C.B.: They're still targeting a late 2020 delivery for those aircraft, and we're excited and looking forward to being the commercial

launch operator for the first civilian tiltrotor aircraft. It's obviously a new generation of VTOL aircraft and one that we think has a lot of promise, particularly in missions like air medevac where every minute counts. And also in missions like VIP, where if we can enhance the efficiency of more true point-topoint connectivity without having to rely upon fixed-wing runway infrastructure, I think that could add a lot of valuable time and efficiency to the VIP market.

V: So have you already decided on a role for those two aircraft? Have you

signed contracts with customers for them?

C.B.: We will operate two of the aircraft. They aren't purchase commitments, but we are going to take delivery of two aircraft and operate them. It's an opportunity for us, in partnership with Leonardo, to test the market for this new generation of VTOL aircraft. We're developing a business case, commercially, with support from Leonardo, to explore these opportunities particularly in a couple of markets — EMS and VIP. *This interview has been edited and condensed.*





PROOF OF CONCEPT

THE AIR TAXI CONCEPT IS A FOUNDATIONAL ELEMENT IN MANY PEOPLE'S VISION OF THE FUTURE OF URBAN AIR MOBILITY. TODAY, HELICOPTERS ARE PLAYING A KEY ROLE IN HONING THE SERVICE.

BY DAN PARSONS

Cruising at 8,000 feet (2,400 meters) above sea level over a patchwork of concrete rooftops lining congested, narrow streets, I flew from the western edge of Mexico City to the airport on the opposite edge of the city in about 15 minutes. It can take well over an hour to complete the 17-mile (27-kilometer) trip by car, travelling from the hilly, upscale Interlomas neighborhood through the congested streets of this city of 21 million people, and out to the airport on the other side.

It was the second ferry flight of the day for Voom pilot Rodolfo Reyes, a former Mexican navy helicopter pilot with 6,000 hours at the stick, who was flying us in a sleek black-and-orange Bell 505 Jet Ranger X. Voom has been providing nighon-demand helicopter mobility in Mexico City since 2018, and has seen relative success flying passengers between five heliports surrounding the city center.

It works much like calling an Uber or Lyft, to use a commonly understood service as a stand-in. My wife and I each downloaded the Voom app to our phones, filled out a brief profile and registered a credit card. The day before our flight, we opened the app, chose Mexico City and selected our preferred origin heliport (Montes Urales), destination (airport) and desired flight time (1 p.m.).

At 3,999 Pesos, or about \$200, the trip is not cheap, but the convenience and time savings make sense for a certain clientele. That's the sales pitch Airbus's helicopter ridesharing service Voom makes for its urban air mobility operations currently available in Mexico City; São Paulo, Brazil; and San Francisco.

The app is still in beta testing, so my wife and I had to sign up separately for the same flight and timeslot. Our preferred time was not available from the closest heliport to our hotel, requiring a 40-minute Uber from where were staying to where we would pick up the helicopter, which underscored the difficulty of going only a few miles within the sprawling city limits.

A LAYERED APPROACH

Voom is one part of a multi-pronged effort by Airbus to position itself for the emerging eVTOL and urban air mobility market. Using helicopters, the company is ironing out the logistical challenges of providing efficient, safe, relatively affordable air mobility in major urban centers before next-generation aircraft come online. And Airbus is just one of a variety of companies, from Uber to Sikorsky and Bell, who are all on the urban mobility bandwagon and are using conventional rotorcraft as a proof of concept.

Approaches to urban air mobility in the present tense differ. Uber Copter offers only one route — from lower Manhattan to JFK airport — which it is using simply as a data gathering project with no plans to expand. Blade, the world's largest charter helicopter service, caters to wealthier passengers who can afford to fly on helicopters at \$1,200 per seat, and it is focused on streamlining its booking service and passenger experience regardless of what aircraft operators choose to fly.



A concept image of the Bell Nexus in operation over a downtown environment. Uber is one of the key potential customers for the in-development aircraft, which could see use in the planned Uber Air aerial ridesharing service. **Bell Image**

Voom does not mirror Uber's user experience, exactly — a helicopter will not come to pick you up at your house — and it is nearly on-demand. Riders can sign up for flights on most routes that leave every hour between 8 a.m. and 8 p.m. In Mexico City, 60 percent of its reservations are made the same day, Monnet said.

With Voom, travelers pay on a per-seat basis, and in order to keep prices affordable, the platform pools passengers traveling to the same destination. To schedule a trip with Voom, travelers can use the Voom app or book online. Passengers can book flights up to one hour before departure. On the day of travel, the passenger simply checks in at the designated helipad 15 minutes before boarding time.

Voom works with existing Airbus-vetted third-party helicopter operators and helipads to deliver its service, and is not an operator. The Voom platform connects passengers with certified helicopter operators in the Voom network.

"Some of these operators have been doing different types of missions, from surveillance to aerial surveys, [and] EMS [emergency medical services]," Monnet said.

San Francisco is a launchpad for Voom to establish operations elsewhere in the U.S., but the company plans to collect extensive data on its Bay Area operation before choosing its next city, Monnet said. The company has flown tens of thousands of passengers over São Paulo, Brazil, since launching its helicopter service there in 2017. It began operations in Mexico City the following year. It operates a network of six helipads in and around both cities.



To handle the volume of aerial traffic required to make a system like Uber Air work, a network of skyports will need to be built across cities. **Uber Image**



In addition to using Voom to focus on the booking and logistics piece of urban air mobility, Airbus is also developing vehicles through the City Airbus and Vahana programs. Another business unit is developing the necessary infrastructure to allow both manned and unmanned air taxis to fly in dense urban areas safely, while yet another is working on urban air traffic management.

"The goal is for us to move people from A to B in a convenient way through the air," Monnet said. "It happens to be helicopters today, but we definitely want to do it with eVTOLs tomorrow, working closely with Airbus on how to make that happen so we are safe, green, quiet and efficient."

FLY THE FUTURE TODAY

Blade, the world's largest helicopter ridesharing service provider, invites its passengers to "fly the future today." The company works with operators to provide booking and logistics services in New York City, Los Angeles, Miami, the Hamptons and it now has three passenger lounges in India, according to CEO Rob Wiesenthal.

Like Voom, Blade doesn't own any equipment. It offers established operators a booking service through its mobile app and website, while helping them optimize efficiency.

"You take that infrastructure; you take that technology, the on-theground expertise from 100,000 users of the brand, and you have an ecosystem of people flying in three dimensionns using rotorcraft today," Wiesenthal told *Vertical* in a recent interview. "We believe that trusted brands that have user bases of people who have already flown will be the first to be willing to try next generation aircraft."



Blade's average route costs \$1,200, too expensive by far to appeal to the scale of passengers needed for an eVTOL ecosystem.

In the beginning, eVTOL travel will likely have limited range, say to JFK, LaGuardia and Newark airports and the cities surrounding them. A market will remain for helicopter taxi service to farther flung destinations, Wiesenthal said.

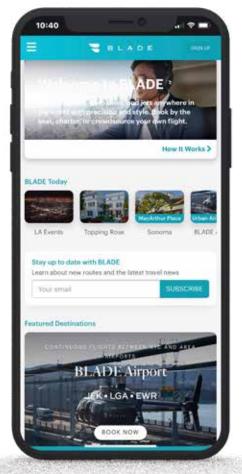
The company is banking on there being a "cohabitation" phase in which conventional rotorcraft retain some longer-haul routes and other specialized missions while eVTOL aircraft are phased into operation.

"Blade will still be flying conventional aircraft, conventional rotorcraft, for a while," he said. "eVTOL is not going to go to Nantucket for many, many years. They're probably not going to go to Montauk, but they might go to the west side of Newark."

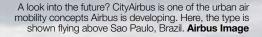
For a variety of reasons, there are about 12 or 14 cities in the world in which urban air mobility makes sense, is an efficient mode of transportation, or could reasonably expect to turn a profit, he said.

"As eVTOL becomes more prevalent and people realize that it's safe, it's quiet, it's carbon neutral and it's less expensive, we'll have more opportunities to land," he said. "For now, it's relegated to [using] the pre-existing infrastructure."

Right now, there simply are not enough safe and publicly acceptable places to land to make urban air mobility feasible in any but the largest cities, he said. Helicopters are too loud and intrusive for them to operate at any real volume in less populous areas. In a sense, widespread helicopter mobility is limited by the technology, not by range or maneuverability, but by the noise it creates.



Voom and Blade use apps to allow customers to make bookings, identifying possible takeoff and landing options and providing available times of transport as well as the cost.



"The question is does the lower noise footprint open people up to having landing zones in places they would previously not have wanted one?" he said. "Our addressable market is driven by where you can land. L.A. is an incredible helicopter market. Unfortunately there are very few places to land."

San Francisco also is an "incredible helicopter market" but the available routes are to and from the suburbs of Palo Alto, Oakland, Monterey and Napa.

"If you want to go from Palo Alto to downtown San Francisco, that's a tough one," he said.

New York City is the largest revenue market in the world for charter helicopter travel. San Francisco and Los Angeles pale in comparison, and cannot yet support a standalone helicopter ridesharing service, Wiesenthal said. As an add-on, leaning on the advertising, logistical and technical personnel based on the East Coast, expansion to L.A. made sense, he said.

"We are lucky to have a big, profitable business in the Northeast," he said. "We could not be successful starting Blade if we started in San Francisco. It would have been a fool's errand."

Blade also is thinking multi-modal in its approach to providing travel booking and mobility services. It has an agreement with American Airlines that would allow a passenger to fly a Blade helicopter to LAX, board a plane, fly to JFK, get on an American Airlines shuttle to another Blade helicopter and then take that rotorcraft directly to any one of three heliports in New York City.

"The American [Airlines] relationship is extremely important for us," Wiesenthal said. "We recognized we had a lot of customers that wanted to fly from Wall Street to San Francisco. That definitely jumpstarted us, but we could never have started this company in one of those West Coast cities."

SEED MARKETS

For companies like Voom, Blade and to some extent Uber, the aircraft passengers are booking for their travel is almost immaterial. Whether helicopter, eVTOL or some other revolutionary vertical-lift platform, these companies are pioneering the ways operators perform logistics, determine pricing, book users and providing customer service.

"All they have to do is fly for us and provide a good, reliable, safe service," Wiesenthal said.

Blade already has a "seed market" of consumers who are familiar with intra-urban rotorcraft travel, which should translate into a base of early adopters when more affordable eVTOL aircraft come online and infrastructure expands to allow service in more locations, Wiesenthal said. Uber believes the enormous user base will likewise translate into a market for airborne ridesharing when it begins to seamlessly offer the services as an option in its app after 2023, according to Eric Allison, head of Uber Elevate.

"For us, the seed market is Uber," he said. "We have about 100 million people around the world who are actively using the platform on a daily basis."

Uber envisions its platform evolving from car ridesharing to a sort of trip optimization service where a user inputs locations A and B and the app decides not only the best route, but the most efficient forms of transportation. Eventually, traveling from Manhattan to Brooklyn could involve a scooter, a car, a helicopter, an eVTOL or some combination of those modes, said Allison.

The main limiting factor to scaling up helicopter urban mobility is the cost of operating and maintaining existing rotorcraft, he said. Uber calculates at least a one-third reduction in seat-per-mile cost is necessary to make the service affordable to a mass market.

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itself, the cost of maintaining it through a lengthy service life, and fuel consumption. "An all-electric vehicle is going to have a much lower fuel cost per mile," said Allison.

"We don't actually think that helicopters are a very scalable service," he said. "With the operational cost associated with helicopters, it's difficult to expand in many areas."

The infrastructure has to keep up with the increased availability of advanced aircraft because an affordable, quiet, eco-friendly eVTOL is useless if it has nowhere to land.

"We're not really focused on an expansion of [Uber] Copter at this point," said Allison. "We're focused on getting it really right on this route we're running right now ... on the Lower Manhattan-to-JFK route. We think that's really critical."

Uber is using the route to tweak and optimize the app's user experience and the logistical footprint of the helicopter operation, gathering data that will eventually be rolled into the eVTOL-era version of its service.

"All of that work will be leveraged down the road and turned into the scalable eVTOL network as it becomes available," he said. Uber plans for demo flights out of its Frisco, Texas, heliport sometime next year with eVTOL flights to begin in 2023. Airbus is on a similar timeline with its City Airbus unmanned air taxi, as is Bell with its Nexus ducted-fan hexacopter. Dozens of other companies are vying to be the eVTOL aircraft of choice for urban air mobility. In the meantime, helicopters continue to do the heavy lifting and likely will through Wiesenthal's "cohabitation phase" and into the future. 🔂



Dan Parsons | Dan Parsons is a writer living outside Washington, D.C., and has covered aerospace and defense issues as a reporter and editor for several publications since 2011

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Where heavy lifting is required, SAF has an Airbus Helicopters H215 Super Puma to take on the job. The aircraft is capable of lifting up to 4.5 tons (9,000 pounds/4,080 kilograms).



French helicopter company SAF was at the forefront of HANDS

helicopter medical services at its inception, and has subsequently grown to operate in almost every sector of the industry.

STORY BY JON DUKE PHOTOS BY LLOYD HORGAN



In 1977, Jean Capoulade created Helicap, a helicopter company serving the Paris area. By 1983, Helicap was running the first civil helicopter emergency medical service (HEMS) operation on behalf of SAMU, the French public emergency healthcare system. Meanwhile, 300 miles (480 kilometers) south in the Savoie region of the French Alps, Roland Fraissinet founded Secours Aérien Français (SAF – French Air Rescue) in 1979, using helicopters as a lifeline for those in need of rescue in the mountains. The two companies built their experience in similar roles, and in 2006 joined forces as the SAF Group, retaining the moniker but renewing it as Services Aériens Français, to reflect their broader capabilities.

"Protection and service are in our DNA," Tristan Serretta, group president, told *Vertical*. "Even with VIP and training now part of our business, our guiding principles remain the same. But a third of our air operations are still HEMS."

SAF has diversified not only into related fields such as mountain rescue, but also utility, firefighting, survey, commercial transport and training. It has bases across France, in Morocco, and on the island of Reunion, east of Madagascar.

With such a repertoire, SAF needs a fleet that is simultaneously diverse enough to fulfil its tasks, but also made up of types that are flexible enough to take on a variety of roles. The company was the first civilian operator of the Eurocopter (now Airbus Helicopters) EC135, which is still its staple for HEMS operations. The venerable Robinson R22 and R44 make up most of its



François Millian is the SAF Group's head of operations. He previously served as a pilot with the company.



Jean-Michel Delval is in charge of safety management at SAF.





training fleet, but as a company that operates a majority Airbus fleet, it is no surprise that it has added two Hélicoptères Guimbal Cabri G2s. These are all put to work under the company's status as a European Aviation Safety Agency (EASA) Approved Training Organisation (ATO), and along with the company's two full-flight simulators, are used for both initial training and type ratings.

Aerial work and public transport are mostly the preserve of the workhorse Airbus AS350's many variations, known in France as the Ecureuil (Squirrel) and elsewhere in the world as the AStar. Where heavy lifting is required, SAF has an Airbus Helicopters H215 Super Puma, capable of lifting up to 4.5 tons (9,000 pounds/4,080 kilograms).

The latest addition to the group is Azur Helicopter, a VIP and charter company based in the French Riviera. While part of the SAF Group, Azur operates on a separate air operations certificate and has its own fleet of aircraft.

Managing the group's disparate activities is François Millian, SAF Group head of operations. Previously a pilot with the company, he worked between bases in summer and flew out of the ski resort town of Courchevel, France, in the winter, becoming the chief flying instructor before taking a year away to fly in Canada.

"I've flown the line, so I know the reality of the pilot's job, although I have limited single-engine experience," he said. However, having spent two years between 2015 and 2017 flying HEMS and rescue flights in the mountains, he is very familiar with the way that the company handles these tasks in some of the world's most popular ski resorts, such as Courchevel and Val d'Isère.

"HEMS at Courchevel is very specifically crewed," he explained. "It is a single-pilot operation, carrying a Gendarme [French interior ministry police] or a CRS [Police] specialized in SAR [search-and rescue], and a doctor from the hospital to stabilize the patient on-site."

SEEING IN THE DARK

Given that all but the foolhardiest restrain their skiing to daylight hours, the mountain rescue task in the resorts is a 12-hour operation. Four of SAF's other HEMS operations are operating 24 hours a day, even though the complexities of French regulation mean that NVIS (night vision imaging systems) have yet to be adopted in the civil sector. This is something that Millian, and others at SAF, are working to change.

"One of our bases has been approved for a six-month NVIS trial starting in December [2019]," he said. "The training plan and the ops spec for NVGs [night vision goggles] are today validated. SAF is proud to be the first French helicopter operator at this level of expertise, and after completion, other users around the country will be able to follow."

Developing this trial and the training plan to support it has not been easy, even though many of SAF's pilots have NVIS



experience from the military. Despite having a regulatory framework for operation, there is no EASA regulation for NVIS training, so SAF had to build the training package from the ground up.

"Civil NVIS operation is very new here," explained Millian. "Some of our pilots from the military have used them a lot, but the French aviation authority doesn't have a lot of experience with them."

Also involved in this expansion of capability is Jean-Michel Delval, who is responsible for safety management at SAF. Having held a variety of posts with regulatory bodies, he understands perhaps better than most how to bridge the gaps in knowledge and experience. He explained that starting from a blank slate involved overcoming some of the organizational frictions resulting from being the ones blazing the trail.

"The first problem was ITAR," he recalled. NVIS systems manufactured in the United States are subject to International Traffic in Arms Regulations (ITAR), and before anything else, the regulators needed to be convinced that the benefits would outweigh the considerable administrative burden involved in acquiring the necessary equipment.

Delval explained how SAF HEMS pilots have previously managed the risk of responding to calls at night. "Pilots would need to make careful approaches to suitable locations that were known to them from their own local knowledge," he said. "If they needed to fly to an unknown site, it was necessary to closely coordinate with units on the ground."

"The regulator had a poor understanding of how NVIS would improve safety and this had to be carefully and clearly communicated to them," he said.

Specialist operations and unusual safety cases are not new to Delval, even though he's just in his second year with SAF. "It's not an easy job," he said. "The range of operations is very broad, even though we only operate small and medium helicopters."

One of the key complexities of Delval's job is that EASA now regulates many more areas of operation than it has done historically, including specialist operations. Looking into the specifics of SAF's operations, it becomes evident that this encompasses a great deal of what the company does, whether mountain HEMS or carrying explosives for avalanche control. All these tasks require specialist approvals, and some specific examples compound the complexity to a degree that would challenge any regulator, let alone the company. Delval's first approval with SAF was an example of such a complex task.



"We were handling an offshore operation in Antarctica with two AS350s carried on board a military ship to transfer stores necessary to sustain operations during the winter season," he said. "This included flying dangerous goods, as well as conducting hoist and sling operations, and we had to conduct the training, preparation and coordination necessary to operate a single-engine turbine in such a hostile environment."

This was the first time that a French civilian company had taken on such a task. While undoubtedly a mammoth challenge, Delval explained that the company's ethos is to embrace such situations. "The culture of the company is always to innovate and be proactive," he said. "One of the biggest challenges is maintaining agility while maintaining and demonstrating compliance with regulations."

A FOCUS ON TRAINING

Even with such ambitions, this kind of can-do attitude can only exist within a culture that allows frank discussion about what constitutes too much risk. Experienced operators must make an educated estimate of the risks involved, and the effectiveness of the mitigations. Providing a cadre of such experts is the responsibility of Laurent Jay, who has been with SAF since 2005. With eight years' experience in HEMS, he is also an experienced mountain rescue pilot. As part of the SAF operations department, he is responsible for crew training and with such a wide variety of operations, this goes well beyond recurrent qualifications.

As well as line training of pilots, Jay conducts mountain flying specialist training and is responsible for training technical crew members and task specialists.

"We've got a lot of crew in the company," he explained. "This makes it complex to plan and efficiently execute training, and a lot of training is required to make this company safe."



The capabilities of the Albertville maintenance facility are impressive. In addition to servicing its own aircraft, the company provides maintenance to fulfil several contracts from the French government.

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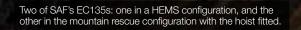
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As might be expected, there is a litany of training competencies that need to be kept current. Pilots fly three flight checks and two simulator checks a year and receive two to three days of theoretical tests, as well as renewing their type ratings and taking a night-flying test once a year. Technical crew members also receive theoretical knowledge training, as well as passing a simulator check involving landing and departing from confined areas or incident sites. This ensures that they can correctly alert the pilot to safety of flight hazards, including obstacles and — the nemesis of all low-level helicopter operators — wires.

SAF has developed its own bespoke software system to keep track of the litany of training requirements, but as with the rest of the operation, training requirements are collectively broad but individually specific. With their own individual requirements, it makes sense that they have their own synthetic training facility, which includes one full flight simulator (FFS) for the AS350 B3+ and another for the EC135 T2+, which is EASA Level B certified and NVIS compatible. These allow crews to train without affecting the availability of line aircraft, but Jay stresses that economics are not the driving factor in acquiring or using synthetic training systems.

"In my post I don't look at money, I look only at the safety of the crew," he said, pointing out that the simulators allow higher fidelity training for emergency drills than does live training. "If you don't use a simulator you can't follow the exact procedure," he explained. "For example, the pilot will never have to push the fire button. In the simulation, we can practice tail rotor failure, autorotation and engine fires."

While Jay has eyes only for the safety benefits of the simulators, Millian enjoys the associated financial value. With the nearest competitor being on the other side of the country, he can offer it to other operators for wet or dry lease. "The SAF EC135 T2+ simulator is the premier FFS in France," he explains. "Although it is in Albertville, so not as accessible as might be desirable, almost all HEMS operators in France have training delivered in the SAF simulator, as do Geneva HEMS."

However, some training must be conducted in the live environment. The AS350s stationed at the ski resorts of Alpe d'Huez, La Plagne and Val d'Isère all fly with a Goodrich rescue hoist fitted, as does the EC135 at Courchevel. A specially trained task specialist is required to operate the hoist, and these aircraft also fly with doctors and members of specialist ski patrols known as pisteurs. All must be familiar with the procedures and methodologies involved in complex rescue techniques, none of which can yet be fully delivered in a synthetic environment.

As ever in the mountains, it is the weather that is singled out by Jay as the greatest threat. "The weather can change very quickly," he said. "But we have very experienced pilots." Jay himself has over 8,000 hours flying experience including a 15-year career in the French armed forces and five years flying mountain rescue tasks.

A BROAD WORKLOAD

It is not only rescue tasks that are carried out in the mountains. Much of the company's utility work takes place there, and naturally it is the only environment where avalanche control operations are necessary. This places demands on the flying crews, of course. But coupled with dispersal of The company has its own synthetic training facility, which includes one full flight simulator (FFS) for the AS350 B3+ and another for the EC135 T2+, which is EASA Level B certified and NVIS compatible.



the company's other aircraft around France and beyond, it also requires a dedicated engineering effort to keep them flying.

Antoine Lebecq is the engineer in charge of airworthiness at SAF, with overall responsibility for the serviceability of all the company's aircraft. He has been with SAF for 12 years and has a technical staff of nearly 40 split between the maintenance facility at the SAF headquarters in Albertville and another in Paris.

The capabilities of the facility are impressive, and the company also provides maintenance to fulfil several contracts from the French government. "We can complete all the maintenance activities on the aircraft, as well as some of the role equipment," said Lebecq.

He explained that having most of their aircraft from one manufacturer lessens the maintenance burden. "SAF helicopter focuses on two types, the AS350 and EC135," he said. "It's easier to get people trained that way."

Maintenance crew start their training in the part 145 facility, then validate their license with either Safran or Airbus Helicopters. "It will depend on their qualifications, but it takes between six months and three years," he explained.

Maintenance planning is greatly assisted by bespoke software, similar to that used to assist their training program, that tracks part life and stock. Also common with the training side of the business, the entire maintenance infrastructure of SAF gives the impression of a very well-found company that has invested the time and effort necessary to grow efficiently. With its experience in the sector, it is hard to imagine there being much in the way of competition, at least for the technically complex HEMS and

THALES







mountain rescue operations, for which the regulatory burden alone must discourage any potential newcomers.

However, nobody at the company gave any indication that it would sit on its laurels, least of all Serretta, who outlined his vision for the future of the company as: "Reinforcing our MRO [maintenance, repair and overhaul] and training facility, modernizing the fleet, becoming more international and remaining innovative." When challenged if that could that mean integrating unmanned operations, the reply is, "Why not?" His strategic aim for SAF is to become the only international player addressing the full spectrum of helicopter services.

This manifesto is doubtless ambitious, even for a company with such a pedigree. But there is no arguing with SAF's track record. In nearly half a century of operation, the group has embraced the challenges of leading the helicopter market in France and beyond. While its enviable fleet of aircraft provides the technical capability to tackle the challenges that presents, SAF has depended on its people to provide the innovation, imagination and dedication to surmount the hurdles that come from being at the forefront. 😵

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HISTORY IN FLIGHT

XG 545

Red Bull's Bristol Sycamore is the last airworthy example of its kind, and a window into the early history of helicopters.

BY ELAN HEAD // PHOTOS BY LLOYD HORGAN

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OF-W

The Bristol Sycamore was one of the first helicopters to be used by the Royal Air Force. The paint scheme on Red Bull's Sycamore honors that legacy, although this particular aircraft was actually delivered to Germany in 1957.



65

Eighty years after Igor Sikorsky first flew his revolutionary VS-300, helicopter design is a relatively mature field. The industry has settled on a handful of configurations and design philosophies, and when you get behind the controls of a modern helicopter, you can usually be confident that it will handle like other modern helicopters, more or less.

The vintage helicopters that survived into the present era, like the Bell 47, tended to be the ones that pioneered those successful design philosophies. So it's easy to forget that there was once much more diversity in helicopters, as their designers pursued ideas that sometimes led to dead ends. Back in those early days, no one was quite sure how helicopters would be used, let alone how to optimize them for their missions. And while everyone was trying to figure that out, even some relatively short-lived models played important roles in shaping the industry as we know it now.

The Bristol 171 Sycamore is one of those helicopters. To the modern eye, it looks more like a cartoon drawing of a helicopter than a functional rotorcraft, with a squat cabin, a three-blad-ed main rotor system that is nearly flush with the roof, and an absurdly long tail. Inside the cockpit, things are equally perplexing. Instead of a thumb switch on the cyclic for trim, the Sycamore has two massive trim wheels on a center console. It can be fitted with dual cyclic controls for two-pilot operations and flight instruction, but has only a single, centrally positioned collective, with a twist-grip throttle attached to the collective at a right angle. It also has a complicated system for transferring ballast fluid between tanks to maintain the center of gravity (CG) within limits — a feature that is simply unnecessary in modern designs.

It's not hard to understand why the Sycamore, which made its first flight in 1947 and ended production before 1960, quickly became obsolete. Today, it is largely forgotten. I had never heard of it until a few months before I made a pilgrimage to Salzburg, Austria, to fly the last airworthy Sycamore in the world, which is now the property of Red Bull's flying display team, the Flying Bulls. And for most of his career, the only pilot currently licensed to fly the Sycamore — Flying Bulls chief rotary-wing pilot Siegfried "Blacky" Schwarz — didn't give much thought to it, either. "I never thought about the Sycamore, never did even know the helicopter," Schwarz recalled. Then, about a dozen years ago, Schwarz was contacted by a German technician named Dieter Hasebrink, a specialist on the model. For decades, the Sycamore's legacy had been zealously preserved by Swiss vineyard owner Peter Schmidt, who had collected multiple aircraft and an enormous cache of spare parts. Now, Hasebrink explained, Schmidt was getting older, and wanted to pass the torch. The Flying Bulls were already well known for their collection of lovingly restored vintage warbirds — would they be willing to add a Sycamore to their fleet, too?

Initially, Schwarz wasn't too interested. But after meeting Hasebrink and seeing the Sycamore firsthand at AERO Friedrichshafen in Germany, Schwarz became increasingly captivated by this peculiar aircraft and its remarkable history. He finally recommended the purchase of Schmidt's collection to his boss, Red Bull owner Dietrich Mateschitz, and the transfer was made in 2010. The Flying Bulls decided to focus their restoration efforts on one helicopter, now registered as OE-XSY, which had last flown in 2006. With Schwarz at the controls, it returned to the air in 2013. "It's really incredible [to] fly such a piece of aviation history," said Schwarz, who is now one of the Sycamore's biggest fans. "And if you think that maybe 40 years ago there was also some guy sitting in this helicopter and flying in the night in a storm out on the North Sea and doing some rescue." Red Bull's Sycamore is more than just a curiosity - it's a flying reminder of the impact the model had both on individual lives and the course of aviation as a whole. As Schwarz put it, "every old helicopter can tell you a lot of stories." Now Red Bull is making sure that the Sycamore's stories aren't forgotten.

A BRITISH ORIGINAL

Produced by the Bristol Aeroplane Company, the Sycamore was the first helicopter to be designed in Great Britain, and was one of the first helicopters to be used by the Royal Air Force (RAF). The RAF paint scheme on the Red Bull helicopter — permission for which was obtained by Peter Schmidt from Queen Elizabeth herself — honors that legacy, although what is now OE-XSY was actually delivered in 1957 to Germany, which operated 50 of the model in search-and-rescue and other roles.

The Sycamore also has a connection to Austria through its designer, Raoul Hafner, an Austrian who moved to England between the World Wars. Hafner had already designed several experimental helicopters and gyroplanes by the mid-1940s, when he was appointed as Bristol's chief helicopter designer and tasked with developing the Sycamore. The first of several prototypes performed its maiden flight in July 1947, powered by a 450-horsepower, nine-cylinder Pratt & Whitney R-985 Wasp Junior radial engine. This was replaced by a 550-hp Alvis Leonides radial engine on the version that was certified in 1949, and on the subsequent production model, the Sycamore Mk. 4.

The five-seat Sycamore filled an immediate need for the RAF in the Federation of Malaya (now Malaysia), where the colonial British







government was battling communist insurgents in the guerrilla war the British called the "Malayan Emergency." As RAF Wing Commander John Dowling recounted in RAF Helicopters: The First 20 Years, a Sycamore was delivered to Singapore for initial operational trials in early 1953. Unfortunately, its wooden rotor blades deteriorated rapidly in the tropical climate, and the trials had to be postponed until a replacement set arrived. Although these fared much better, heat and humidity would continue to take their toll, ultimately resulting in two fatal accidents due to main rotor blade disintegration. Following the second of these in 1959, the RAF Sycamore fleet was temporarily grounded while the blade design was modified.

Despite this very considerable shortcoming, Dowling said the Sycamore acquired an "excellent reputation" in Malaya, where it replaced the underpowered Westland Dragonfly, a license-built version of the Sikorsky S-51. The Sycamore also shone in comparison to the larger Westland Whirlwinds - license-built versions of the S-55 - which at the time were still powered by Wasp radial engines. Not only did the Sycamore have much better serviceability rates, it also carried more payload in Malaya's hot-and-high conditions, despite being a smaller aircraft.

the Sycamore. He also performs aerobatic displays in Red Bull's specially approved MBB Bo.105 helicopters.

In 1960, however, Westland equipped the Whirlwind with a turbine engine, and the aircraft leapfrogged ahead. The larger helicopter industry also shifted to turbines, and production of the Alvis Leonides ceased in 1966. Meanwhile, helicopter manufacturers also moved away from temperamental wooden blades in favor of metal and fiberglass ones - all of which meant that by the time Red Bull acquired its Sycamore, the manufacturing techniques used for both its engine and rotor blades were lost arts.

Helicopter maintenance supervisor Thomas Schörghofer joined the Flying Bulls in 2011, not long after the Sycamore did. He explained that when Red Bull's maintenance team performed an initial inspection on the aircraft, they discovered a corroded cam ring on its Leonides engine. "So then we [made] the decision to remove the engine and to repair it, but it was not easy, because nobody [had] knowledge on this engine," he said.

Eventually, the Flying Bulls connected with CFS Aero, an overhaul and repair facility in the U.K. Working with several spare engines that were included in Schmidt's collection, CFS remanufactured an engine using the best parts from each. "But a big problem then arose — there was no test stand, so they [could] not run the engine in the U.K.," Schörghofer continued.



So instead, CFS shipped the engine back to Salzburg, where the Flying Bulls installed it in the aircraft for ground runs. "And there [were] some minor problems, and [we had] to remove again the engine, repair it, reinstall it. So it was taking a lot of time to do that," he said.

The Flying Bulls were also wary of the Sycamore's wooden rotor blades, which were more than half a century old and impossible to inspect internally. Fortunately, there were enough spare blades in Schmidt's collection that they were able to send some to the Graz University of Technology for destructive testing. According to Schwarz, the tests revealed that the precisely crafted blades were "in really good condition," easily up to their original certification standards. The wooden blades may have suffered in tropical environments, but apparently they did just fine in temperate central Europe.

There was one final hurdle to flying the Sycamore: an operational rather than a technical challenge. Because there were no longer any authorized Sycamore instructors — no licensed Sycamore pilots at all, in fact — there was no one who could provide Schwarz with training on the model. In order to teach himself how to fly it, he was required to obtain a test pilot license from the European Union Aviation Safety Agency (EASA). Fortunately, if anyone was qualified for the task, it was Schwarz — a renowned flight instructor and champion helicopter aerobatics pilot with decades of experience under his belt.

organization in order to sign himself off for his check flight. "Finally I could give myself the certification that because I was the head of training, I have trained myself," he explained. "And with this letter, the authority could send me an examiner who [had] never seen the Bristol Sycamore before." Today, Schwarz is still the only pilot licensed on the model, although he hopes to train another pilot in the not-too-distant future. Unfortunately, on the Sycamore, that's not as simple as it sounds.

MADE FOR CRUISING

To understand the Sycamore's idiosyncrasies, it's necessary to bear in mind that it was "a completely individual development by the Bristol Aeroplane Company, not derived from any previous production helicopter," as John Dowling explained in his RAF history. As such, "it displayed characteristics which reflected specific personal convictions of its designer — Mr. Raoul Hafner."

According to Dowling, Hafner wanted "a fast manually controlled helicopter which cruised and stood on the ground with the fuselage substantially level." To achieve manual control without the need for hydraulic assistance, Hafner developed a "spider control" for the main rotor system in which metal tie bars carry blade centrifugal forces rather than the flapping hinges. In most helicopters, multiple control rods act on a swashplate near the rotor blades, but in the Sycamore, control inputs are transmitted through a single control rod to the "spider" assembly on the main rotor head, similar to the approach later used on Enstrom models.

Eventually, he had to establish an EASA-approved training



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In the late 1940s, helicopters were still a largely experimental technology, with many of their eventual uses yet to be discovered. It was not obvious to Hafner that some of their most valuable applications would involve prolonged hovering, so he chose to optimize the Sycamore for cruise flight "on the grounds that the helicopter spent only a minute fraction of its time in the takeoff and hover," as Dowling put it. To achieve a level fuselage attitude and comfortable cyclic position in cruise flight — around 70 knots — Hafner tilted the Sycamore's rotor head forward approximately five degrees. He also arranged the control system so that the cyclic was centered laterally as well as fore-and-aft in the cruise, rather than requiring the pilot to input increasing left cyclic with higher airspeeds (on the clockwise-turning main rotor system).

This means that in the hover, the pilot must hold the cyclic back and to the right to counter the Sycamore's tendency to drift forward and left. Prior to takeoff, the pilot uses the trim wheels on the center console to tension the cyclic trim springs to the correct position for the hover. However, because the aircraft is transitioning from a nose-level attitude on the ground to a nosehigh attitude in the hover, the pilot must pre-position the cyclic for takeoff against the pressure of the springs — and failure to do so correctly can have severe consequences.

Recalling the experiences of early RAF Sycamore pilots, Dowling wrote, "If the pilot failed to find the correct position, he was immediately made aware of an error in the fore-and-aft sense

because he could see and correct any tendency for the aircraft to move forward or backwards. Insufficient right pressure on the stick was more difficult to detect because sideways motion was resisted by the non-castering main undercarriage wheels." In such an instance, the type of slow, careful takeoff that is used to avoid dynamic rollover in skid-equipped helicopters could actually trigger it in the Sycamore, causing the aircraft to pivot over its left rear wheel and onto its left side. According to Dowling, "If the stick were correctly positioned before takeoff or if the 'unstick' was performed reasonably smartly, there was no danger. Both precautions were part of the basic technique."

Decades later, when Schwarz was preparing for his own first flight in the model, he sought advice from former Sycamore pilots from the U.K., Germany, and New Zealand. They duly warned him about this peculiarity, but Schwarz might have taken their warnings too much to heart.

"The only thing they could remember was when you lift off, you have to pull the cyclic full to the right," Schwarz told me. When the time came for his momentous first takeoff, with cameras rolling and the fire brigade standing by, "I pulled on the collective and in my mind I still had to keep the cyclic to the right. [But] you have no idea because you have no hydraulic assistance — you need a lot of force on the controls and it's not reacting like a normal helicopter." In his attempt to avoid rolling to the left, Schwarz actually pulled the cyclic too far to the right, causing the helicopter to bounce off its

ROWLAR FORCE HR SUPPOP

The Sycamore's fuselage is made from hydronalium, a corrosion-resistant aluminum-magnesium alloy.

right rear wheel, then its tail skid, before he regained control.

"It was guite an exciting time!" he said. "But finally after three or five seconds where everybody was afraid, I got the [feeling for it]. And then it was a pretty stable hover and our test program [started with] five hours just hovering around."

Like Schwarz, most of the early Sycamore pilots quickly got the hang of the heavy controls. "Of much more concern," according to Dowling, was the shared central collective lever in the production Sycamore. Early prototypes had the pilot sitting on the left, in keeping with fixed-wing aircraft, but in the production model the pilot was moved to the right seat, enabling the comparatively free left hand to manipulate switches and radios. Rather than adding a removable collective lever to the left-hand side for training and two-pilot operations - as became standard practice in the helicopter industry — the Sycamore made do with a single shared collective, with a twist-grip throttle mounted at a right angle for use by either pilot.

"This regrettable aberration produced the most serious and only really thoroughly objectionable feature of the Sycamore," Dowling wrote, blaming the eccentric design for numerous incidents and accidents, "as well as extending the instructor's course on the aircraft by at least 10 hours for each pilot (i.e. 30 percent), and often more. . . .

"The fact was that only the helicopter pilots who had tried it knew how difficult it was to change hands on the controls, and how frequently the aircraft would very nearly crash while attempting to maneuver near the hover or in transitions to the hover while flown from the left seat." According to Dowling, by the time the consequences of this "unfortunate error" became apparent to the Sycamore's operators, it was too late to reverse it.

FLYING BACK IN TIME

I wasn't fully up to speed on this history when I had a chance to fly Red Bull's Sycamore in August of this year. But I certainly knew enough about the aircraft to recognize what an enormous privilege it was to even sit in it, let alone touch the controls. Of course, I also realized that flying the last airworthy example of any aircraft type is a particularly high-consequence endeavor, since even minor damage can't necessarily be easily repaired. So I was happy to follow Schwarz's lead and fly as much, or as little, as he saw fit.

From the left seat, I followed along as Schwarz went through a relatively straightforward piston engine start and run-up sequence in front of Red Bull's legendary Hangar-7 at the Salzburg airport. When we were ready to depart, Schwarz ground-taxied us away from the hangar, then carried the momentum through a rolling liftoff into a hover taxi. Cleared for takeoff by the tower along with an accompanying Red Bull camera ship - an Airbus AS350 we didn't linger long over the runway. As soon as we were up and away. Schwarz made a couple of adjustments to the trim wheels, then turned control of the cyclic and pedals over to me. He retained control of the collective and throttle because of their strange configuration, and he also managed the CG compensating system, which was utterly unfamiliar to me.

I quickly realized that there wasn't much to my job, since the Sycamore does indeed fly very comfortably in cruise flight. Although I was initially wary of those huge trim wheels, it didn't take me long to get the feel for them (granted, not having to simultaneously manage the collective and throttle undoubtedly helped). It wasn't until the end of our flight, when I was flying an



To avoid ground resonance, the dampers on the main landing gear must be kept filled and in good condition.



rotor blades, which are visually inspected before and after each flight.



Red Bull's famous Hangar-7 (in the background) is open to the public. All of the vintage aircraft in its collection are kept in flying condition





approach back to the airport and Schwarz set the trim wheels for the hover, that I really had to work at it. Arriving in the hover felt a bit like flying an AS350 with the hydraulics off; I wasn't prepared for it, and Schwarz resumed control before I embarrassed myself. According to Schwarz, these transitions are the most difficult part of performing in air shows with the Sycamore. "During hover or if you change speed, it takes an incredible amount of force because you have not the time to change the trim wheels, especially if you fly a display," he said. "So you are covered with sweat. ... You just have to do it with brutal force to force the helicopter to do what you want."

Schwarz was more positive about the Sycamore's handling in autorotation, which I didn't have the opportunity to experience. The high-inertia main rotor blades mean "you have an incredible amount of reserve energy stored if you do an autorotation," he said. "These blades really want to fly and they are heavy. So an autorotation is really a piece of cake in this helicopter." diligence in collecting spare parts, the Red Bull Sycamore has unusually good prospects for an aircraft of its age and rarity. According to Schwarz, "it was many full truckloads [of parts] that we brought from Switzerland to Austria" — encompassing everything from critical items like rotor blades and gearboxes, to such minor fixtures as position lights. "I guess I have 140 red position lights and 120 green position lights," Schwarz pointed out.

With luck, the Sycamore will continue flying for many more years to come, educating and inspiring air show audiences and visitors to Hangar-7. And, in the process, providing unique insight into how the helicopter industry got started, and how it evolved.



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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Two Hélicoptères Guimbal Cabri G2s, operated by Synergy Flight School, fly over downtown Edmonton, Alberta. The company is based on the edge of the Alberta capital, in the small settlement of Villeneuve. 11

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In launching Synergy Flight School, Villeneuve, Alberta-based Synergy Aviation is taking a proactive approach to the industry's pilot shortage.

STORY BY OLIVER JOHNSON PHOTOS BY HEATH MOFFATT

In the helicopter industry, talk of a pilot shortage is nothing new. But over the last few years, it has grown from a quiet thrum in the background to become the industry's predominant concern — the subject of an ever-increasing number of articles and panel discussions at conventions. There is clearly no silver bullet, but one forward-looking company, with roots in the Canadian utility sector, has sought to tackle the issue head-on by launching its own flight school. Though still in its early days, Synergy Aviation's flight training school has already proven a remarkable success in not only providing its parent company with a steady stream of highly-capable pilots, but also in developing a feeder system to enable its graduates to establish careers in an industry that remains largely inaccessible to freshly-minted, low-time pilots.

Today, Synergy Aviation and Synergy Flight School share adjoining modern hangars that span 35,000 square feet at Villeneuve airport, which is about 10 minutes' drive from the edge of Edmonton, Alberta. The companies have a combined staff of about 40 and a fleet of 15 fixed- and rotary-wing aircraft, with a flexible flow of aircraft and personnel between the two to balance the variations in workload.

Synergy Aviation was launched at the end of 2014 by industry veterans Todd Tkach and Marc Hanatschek, along with a couple of investor partners. The company's focus then, and now, is on environmental surveillance within the oil-and-gas sector, largely utilizing Robinson R44s due to the aircraft's low acquisition cost and its ability to perform multiple starts a day without impacting the lifecycle of its piston engine.

Developing a flight school was always part of the team's plan in helping Synergy grow. "We've known for many, many years that there's a pilot shortage," said Hanatschek. "We knew the work we were going to do was not going to be super attractive to the 8,000-hour pilot, so we knew [having a flight school] was going to be a component [of building Synergy]."

The opportunity to do so arrived earlier than the management team anticipated, with the chance to purchase E-Z Air MNP

Helicopter Services, a small training company that had been in operation for a couple of decades, in 2016. Following the acquisition, Synergy essentially restarted the school with an entirely new structure, new location, and new aircraft. The decision was also taken to offer the training on a full-time, Monday-to-Friday basis, over a concentrated period of four months, with two intakes a year (September and February).

"We want to ensure that there's a certain standard of graduate that leaves our school," said Hanatschek. "To reach that standard, you need to be serious about becoming a pilot. You can't do that part-time. If they're not going to treat it like a job from the beginning of the school, to all the way until they have enough hours to be employable, it's not the career for them."

Watching the students progress through the flight school gives a better indication than any resume could ever do as to the quality of a pilot, said Tkach.

"There's no short cuts — we can watch each class for four months," he said. "They're in the same building, and we see the people that show up on time, that put in the extra mile, that take it seriously, that stay and help clean the machines. It's like a fourmonth job interview."

PUTTING IN THE HOURS

In Synergy's ground school, its helicopter-specific curriculum includes lessons/lectures, assignments, and periodic online-based tests, which allow instructors to objectively check students'

progress. Topics covered during ground school include meteorology, helicopter aerodynamics and theory of flight, Canadian Aviation Regulations, human performance and decision making, and airport operations.

The students complete a written exam after the first 50 hours of flight time, and generally take their flight tests after having completed about 95 percent of their flight hours.

In addition to classroom work, a typical day for the students includes an inspection of the helicopters, a discussion and interpretation of the weather forecast, and a preflight and postflight briefing.

In the air, training includes flight control exercises completed during circuits of Villeneuve airport, as well as emergency exercises, navigation, and confined area work away from the airport. Students are encouraged to take part in all the typical work required to operate a helicopter, such as refueling the aircraft from fuel caches out in the bush.

The area around Villeneuve airport provides a variety of training environments for students, such as landing and taking off from oilfield and forestry logging sites, and operating in confined areas in dense forest. The nearby Canadian Rockies provide opportunities to practice mountain flying (Synergy also offers a mountain flying certification for those interested in pursuing work in that environment).

As part of the student's training, Synergy tries to give as much exposure to different types of operations as possible — such as an introduction to long line work.





"We want to give them all the solid basics of, 'Here's what you're going to encounter in the rest of the industry,' " said Hanatschek. "It's not a risk-free business, but you can mitigate the risks a lot with solid training."

Synergy Aviation's fleet includes eight Robinson R44s, three Hélicoptères Guimbal Cabri G2s, one Airbus AS355 TwinStar, two Cessna 172s and a Beechcraft King Air.

The TwinStar is used across both companies. In the school, several students are using it to get twin-engine and instrument flight rules (IFR) training and endorsements. At Synergy Aviation, it's a popular choice among oil-and-gas customers, and it's also a good fit for the growing amount of tourism work the company is finding in the area.

The latter is a key part of Synergy's process for helping students launch their careers.

"Students come out of school with 100 hours, and it's not that people don't want to hire them at that stage, or that they're unskilled, but the industry has no work for them," said Hanatschek. "So what we're focusing on is building the tourism part of our business, so that we can hire them up right out of flight school, get them 300 to 500 hours, and then they become employable. That's the key with the whole thing here: The goal of the school is not to get a license; the goal of the school is to get everybody over there employed."

As the flight school expands, so will the company's fleet, with

aircraft that can fulfill a dual role as both a good trainer and a useful utility machine preferred.

Students currently have a choice between the R44 and the Cabri (and the TwinStar for twin time), but the majority of the school's training is completed in the Cabri.

Tkach said the Cabri has been an "ideal machine" for training, praising the aircraft's autorotation characteristics in particular.

CLASS EXPANSION

Synergy's class sizes have quickly grown, from a couple of students at a time to 10 per semester. The company has added new instructors along the way, including industry veteran Steve Smith (one of only a handful of instructors in Canada who can issue Class I instructor certificates); Justin Cruse; and Illona Inman. They have a range of backgrounds, with experience in operations ranging from firefighting to medevac, military operations, and heli-skiing.

James Pantel is the school's chief flight instructor, and has been an instructor at the company for 13 years — back to its days as E-Z Air. He said the biggest challenge of his job is in finding the best approach to working with various types of student personalities.

"Some students make my job really easy, and we've got a really great group right now— you just give them the material, present it, train them and in no time they're doing what you showed them," he said. "Other times, you can hit a metaphorical wall with a student and you got to find ways to chip away at it."



Despite the flight school's location in central Alberta, the weather doesn't impact day-to-day operations too greatly, even in the winter, he added.

"The weather here is pretty good — we do get a lot of good days, but there are the cold snaps, and at -20 C [-4 F], we shut the Cabri down," said Pantel. "When it comes time for solo navigation and things like that, you want that perfect day. You're not going to send a guy out hoping for the best."

The immediate surroundings are largely flat, but there are mountains nearby that the instructors try to take all students to at least once during a course, as well as a deep valley that provides a useful location to practice emergency landings and work in crosswinds.

Inman joined Synergy from the military, completing her instructor training at the flight school.

"I was flying the [Bell] 412 in the military and I expected that it would be quite an interesting step [to the Cabri]," she said. "I've really enjoyed the Cabri — it's a very agile machine, and it's great for students because you can fly it very smoothly and it handles very nicely. It gives them no excuses!"

Ray Gervais is the flight school's manager, and is also one of the school's graduates. The reputation of the school has grown quickly, he said, with potential students reaching out from around the world to enquire about joining the school.

"Most people contact us through the website," he said. "I get in touch with them right away and we have an hour-long discussion about what it is to be a helicopter pilot, what the training entails, what the future is, and what their career could potentially look like." In addition to his responsibilities in terms of administration at the school, he is working on his instructor rating, and will soon become the company's fifth instructor.

Cruse was one of the first students at the flight school, then joined Synergy Aviation to work as a general utility pilot, where he built up his hours. When he had reached about 1,000 hours, he completed his instructor training to allow him to join the teaching ranks at the flight school. "The training of the students isn't too difficult, it's the training of the instructors that just takes more time," said Hanatschek. "We're building the program as efficiently as we can."

However, like the other instructors, Cruse still flies for Synergy Aviation when needed. And having the flight school work so closely with the parent company provides benefits to both.

"There was a lot of good that came to Synergy Aviation from Synergy Flight Training — thinking about building out the content to teach students something, training people on how they should be doing things," said Hanatschek. "It ends up making Synergy a better place as well, and when the instructors come and work here during the busy summer season, they're so much better as pilots from the instruction they've been giving."

Colter Engelman is among the current cohort of student pilots who began training in September. Seven weeks into the course, he had already reached 33 flight hours.

"I wanted to commit myself to it and live and breathe helicopter flight school for a few months and just really drill it into my memory," he said. "For me, that works better than doing it part time." He said the potential to work with Synergy Aviation following graduation was also an appealing factor in choosing the school.

"We'll have to see what comes in the next 90 [flight] hours, but fingers crossed I can get on with them after I graduate," he said.

FINDING WORK

The former students hired by Synergy typically begin their work with the company performing tourism flights or as techs in the surveillance program. "They fly with an experienced pilot to see how the work is done and what they're looking for," said Tkach. "In the meantime, we use them for ferry flights or rides at festivals and different events."

Many of Synergy's customers have historically had requirements for pilots on their contracts to have a minimum of 1,500 or 1,000 hours, so part of the operator's work in enabling clearly capable low-hour pilots to take on this work is in educating clients.

"We're telling them: 'If you don't work with us, there won't be any 1,500-hour or 1,000-hour pilots, because how do you get them from 100 to 1,500 hours if they can't fly for anyone?' " said Tkach. The solution has been to present the company's mentorship program, in which a senior pilot is used in the left seat, and a lower-time pilot is in the right seat to build their pilot in command (PIC) time. In addition, Synergy guarantees regular extensive training and other "extras" to mitigate the risk and make customers more comfortable with the idea of using lower time pilots. "As a result, some of them we've been able to convince to reduce their minimums to 750 or 500 hours." said Tkach.

Synergy also works hard to find employment opportunities for its students outside the company by utilizing the management team's extensive network of industry contacts. But while this has the potential to open new doors for students, Hanatschek said they only recommend students if they know they would be a good fit for a given operation.

"We know everybody in the industry, and we've worked alongside them for over 25 years," he said. "We're not going to send students to these guys if we don't think they are a good fit. When we recommend somebody, it's: 'You should hire this person because they're good.' And we actually believe they'll fit into their organization."

However, the quality of the students Synergy has already produced has even taken the management by surprise.

"I thought we were going to have a steady supply of decent pilots, but what's happened is we have got rockstars coming out of that school and into Synergy Aviation," said Hanatschek. "We have people working here that you would bend over backwards to employ anywhere else."

KEEPING THE FLEET FLYING

The company's director of maintenance (DOM) is Terry Edwards, who joined the company in April 2018 having worked with Hanatschek at the start of his career. The department has nine AMEs, including Edwards and Hanatschek (who previously served as DOM himself), and the team works across the Synergy Aviation/Synergy Flight School fleet.

The shift pattern for the maintenance team is flexible, with some on a three-weeks-on, two-weeks-off schedule, and others working a Monday-to-Friday shift every week.

"The Cabris are pretty new to us, so we're definitely learning as we go, like anybody with something like that," said Edwards. "But they've been pretty good so far. It's all scheduled maintenance,



Synergy Aviation and Synergy Flight School share the same maintenance team Nine AMEs are able to service the fleet, working a variety of shift patterns to ensure coverage when needed.



Chief flight instructor James Pantel makes a point during a ground school class.



The TwinStar (left) is used across the two companies. If students want to do so, they can use it for twin-engine and instrument flight rules (IFR) training and endorsements.



Synergy tries to give its students the opportunity to experience as wide a variety of operations as possible during their training, and also hopes to provide an increasing amount of data to potential employers about their students' capabilities to enhance their chance of finding work.

and we know ahead of time when things need to be done." Peter McDonald is a recent addition to the team, bringing 38 years of experience to the company.

C-GSYN

"This is an interesting company because there's so many young people who are really motivated, and they bring that enthusiastic spirit to the work," said McDonald.

Two of Synergy's Cabris have now flown over 1,000 hours, while the third has flown over 500. The maintenance required on the type so far has been very light, with all items replaced on condition apart from the main transmission, tail gearbox, and the engine.

"Guimbal cares about their aircraft, and they designed it properly," said Hanatschek, adding that he has been impressed with the support Synergy has received from the manufacturer thus far.

Early in the school's development, one of its Cabris suffered a hard landing, resulting in the aircraft being used for parts. However, the incident served to prove the durability of the aircraft, with its two occupants walking away from the incident entirely unscathed. The company has also used it as a learning opportunity.

"It reminded us that flight training is high risk," said Hanatschek. "But we got out of it completely unscathed. Any other aircraft would've been completely destroyed, but with the Cabri, it's all carbon fiber and it's built like a little tank. You can barely tell it crashed. So we decided to double down on them."

Apprentice aircraft maintenance engineers (AMEs) will be the next area of focus for the company, with Hanatschek planning to launch co-op programs to bring in students from local high schools, and then send them to college for maintenance training. Synergy's in-house technical capabilities spread far beyond servicing their aircraft, with Jim Bauer, manager of the devel-

opment department, and Jeremy Unger, manager of the IT and GIS department, providing the company the ability to develop a custom-made flight data monitoring (FDM) system, flight training devices, and tools to enhance data collection, analysis and presentation across both companies.

The FDM system created by Bauer uses a camera in the cockpit to read the various gauges and uses machine learning to interpret the images into data form, noting any exceedances.

So far, the system has been field tested in the R44 and TwinStar, but it is being designed to be aircraft agnostic. Synergy is aiming to have it installed across its fleet by March.

The data the system provides has more use than simply noting how an aircraft was flown on any given day — Synergy can use it to help reduce customer minimum hour requirements.

"We're recording all of that data, not to say, 'Oh, you screwed up,' but it's to prove to the rest of the world that our guys are more than qualified to do the work being asked of them," said Hanatschek. "We can provide the data for the last however many hundreds of hours that a pilot has flown with us and show that this is how he or she flies, they've done this many autorotations, and this is what happened in each one. It's proof of what we're telling them, and it should be changing how people are hired."

The data will also prove extremely useful during a student's path through the flight school itself, helping them highlight areas they

need to focus on during their training.

Looking ahead, Synergy is in the process of developing and launching a fixed-wing school, using the Cessna 172 as the main training aircraft, with a first intake scheduled for April 2020. The first cohort will likely be a smaller one of four or five students, which will ultimately be ramped up to around 20 per intake.

Despite the challenges and headwinds presented by a career in aviation, Tkach said he still believed it holds the same appeal as it always has.

"It's still a romantic career, to get in an aircraft, go fly and explore the world," he said. "There are a lot of road blocks in the way for new pilots, but if you work hard, are persistent, and you take it seriously, then it's like anything — you'll succeed."



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



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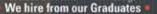
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ALWAYS CONNECTED

Flightcell International is helping helicopter operators do their job as efficiently and safely as possible by staying ahead of the technological curve.

STORY BY DAYNA FEDY PHOTOS COURTESY OF FLIGHTCELL INTERNATIONAL

Achieving cellular and satellite connectivity from the cockpit at 4,000 feet (1,220 meters) might have once seemed like a daunting task for service providers, especially in remote locations. But as technology has progressed, not only have satellite and cellular connectivity become possible (as separate entities) in aircraft, but pilots can now access voice, data and aircraft tracking software simultaneously from one piece of hardware. The hardware in question, DZMx, is produced by Flightcell International of Nelson, New Zealand, and it's what the company is best known for.

"[DZMx] is unlike any other product in this area because it's a product platform, not a product," said Michael Eddy, marketing and communications manager at Flightcell. "The DZMx has over 60 different product variants and configurations that customers can order; we built it specifically like that, so it can be flexible."

The idea behind the company came simply from necessity. Flightcell's founder and CEO, John Wyllie, who is also a helicopter pilot, became frustrated one day in the mid-1990s because he could not use his cellphone while flying. In a humble workshop environment with the drive to create a solution, he developed the first cellphone-to-headset interface, which he called "Flightcell." The product has since evolved into the Flightcell DZM systems and inspired other products like the rugged alloy Iridium Satellite Phone Cradle.

Flightcell provides satellite and cellular communications and tracking primarily to first responders and military branches in North America, Europe and Australasia, targeting the larger turbine rotary-wing airframes that are operated in these sectors.

BUILT FOR LONGEVITY

The DZMx initially started as the DZM1, evolving into models 2 and 3, and finally the "X." Eddy said the "X" model is here to stay, because the hardware has been designed to be updated as often as needed "to keep up with technology, trends, and customer requirements. It's an evolving platform with longevity."

The DZMx is microprocessor-controlled, with modular hardware boards and SIM card slots that can slip in and out of the device to utilize the satellite and cellular networks. Flightcell wanted to ensure that operators would not be tied to one particular service provider with the DZMx, so the company has partnered with a list of network and tracking service providers. "We're completely

Flightcell International provides satellite and cellular communications and tracking primarily to first responders and military operators. Its DZMx system allows pilots to access voice, data and aircraft tracking software simultaneously from one piece of hardware.

Flightcell* DZMx

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Flightcell refers to the DZMx as a product platform, rather than a product, as the company gives a software development kit to its partner service providers and the end users can choose any provider they like.



vendor-agnostic," said Eddy. "It's a real strength . . . if an operator sees a benefit of another mapping service, there is nothing to stop them signing up to it."

Essentially, Flightcell gives a software development kit to its partner service providers, and the end users can choose any provider they like.

Eddy said this form of flexibility comes in handy when operators want to standardize the software in their fleets. "For example, a customer could have 10 helicopters and they've all got Blue Sky Network's hardware in them. Then they get two new helicopters from Leonardo that have DZMxs in them . . . they can still track that DZMx using the Blue Sky system."

Leonardo offers the DZMx as a factory option, though the device can be installed in virtually any helicopter type. The most common airframes that use the DZMx are the turbine and multi-role aircraft used by search-and-rescue (SAR), EMS, fire and law enforcement operators.

While the device is relatively small (only 4.95 inches/12.6 centimeters wide), there are usually only minor modifications required for installation, and a supplemental type certificate is not needed. Installation typically includes the DZMx in the cockpit, a remote head unit in the cabin, a cellular antenna on the bottom of the airframe, and a satellite antenna on the top of the airframe.

Based on an operator's field of service, different customizations can be made to the device to suit various requirements, such as adding Iridium push-to-talk, a second Ethernet port, or additional inputs. A firefighting aircraft may, for example, require additional inputs to report bucket loads during operations.

The most common customization, Eddy said, is the number of satellite and cellular transceivers that are included on the DZMx. "Most customers will order one satellite and one cellular modem, so they can have the best of both worlds," he said. "So, if they don't want to use cellular networks, they can have two simultaneous satellite calls . . . and likewise for cellular."

As a night vision-compliant device, the DZMx also has different night vision display options (A or B) that operators can choose from based on preference. "The U.S. military tends to prefer night vision A, [and] everyone else has night vision B," said Eddy.

The U.S. military is among a list of large industry players around the world that use Flightcell's DZMx, including the

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Cal Fire is one of many operators that uses the DZMx. The device is capable of tracking the location and volume of water picked up and released by an aircraft, and the identification of the bucket or tank being used, among other features.



California Highway Patrol, California Department of Forestry and Fire Protection (Cal Fire), Texas Department of Public Safety, Australia's Royal Flying Doctors, and the Chilean and Korean air forces.

Among the nearly 4,000 DZMx devices installed in aircraft around the world, there are over 60 versions of the platform when factoring in the numerous customization options.

SECTOR SUPPORT

Helicopters play a wide and vital role in first responder operations, which include law enforcement, fire, SAR and helicopter emergency medical services (HEMS). While rotorcraft already offer time-saving benefits over ground vehicles, the DZMx can expand the efficiency of these operations further — a major reason why the device is so largely used in first responder sectors.

HEMS operators can use the DZMx to call and coordinate with hospitals for patient transfers, communicate with people who are with casualties on the ground, administer basic first aid over the phone before arrival, and coordinate with SAR operators.

"We've had instances where people have been lost, they still had cell phone coverage, but they were in the middle of a forest.... The helicopter pilots told the people who were lost to direct the



By not offering services, it allows us to focus on the hardware and the software inside the [DZMx] unit itself. We feel we've got a unique product; it's quite unlike anything else.



helicopter over top of them [over the phone]," said Eddy. In a medical helicopter, the DZMx proves valuable in saving time when minutes matter. Eddy said as far as the company is aware, it's the first to prove that data from an electrocardiography (ECG) machine can be sent from a helicopter to a hospital; the DZMx is able to provide a hotspot for the medical monitor using built-in WiFi.

"If you're in an ambulance getting driven to the hospital, they can send [the patient's] ECG rhythm back [to the hospital], and then they can start preparing and get the cardiac team ready to receive the patient," said Eddy. "Whereas the helicopter usually has to land and then give the ambulance the print out from the medical monitor.

"You're losing precious minutes of preparation time, which could save people's lives. So, we can do that from a helicopter now." Medical helicopters also typically have a DZMx in the cockpit and a remote head unit in the cabin, so the medical crews can make phone calls at the same time as the pilot.

With weather always being a major flight planning and safety factor — for any pilot — the DZMx device ensures a network is always available to check weather in-flight using a cellular internet connection, or look at an alternate landing zone map if necessary. If the aircraft flies out of cellular network coverage, the DZMx continues tracking and operating by auto-switching to the next best option, which is Iridium satellite.

The auto-switching coverage comes in handy in the aerial firefighting sector — especially in North America and Australia where automated flight following requirements have been implemented. The DZMx is capable of tracking the exact flight path of an aircraft, the location and volume of water picked up and released, and the identification of the bucket or tank being used, among other features.

A company of just 18 employees, Flightcell covers a lot of ground. "We're very small, but we do a lot," said Eddy. "The people who design the hardware also provide the [customer] support." But to widen its global reach, the company has roughly 30 resellers of its products worldwide.

While continuing to grow, Flightcell is remaining focused on its ability to stay ahead of the technological curve, and help operators in the industry do their job as efficiently and safely as possible.

"By not offering services, it allows us to focus on the hardware and the software inside the [DZMx] unit itself," said Eddy. "We feel we've got a unique product; it's quite unlike anything else."



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

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SUMMI

GRAND PRIZE



> JEREMY KORESKI

A photographer from the small coastal town of Tofino, British Columbia, Jeremy Koreski specializes in outdoor photography. His assignments take him around the world, shooting for a wide variety of clients.



West Coast Helicopters' chief pilot Clayton Spizawka files an Airbus H125 on a helimountain bike adventure for Nimmo Bay Resort in British Columbia. "This particular trip we were location scouting some of the downhill potential in the area, and I was dropped off on a ridge to check out the terrain and take a few photos," said Koreski. He captured the moment perfectly, with the aircraft silhouetted against the valley behind it, which had become bathed in a golden light.

Vertica

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Welcome to the results of the 2019 edition of the *Vertical* Photo Contest! First and foremost, we're delighted to announce that Jeremy Koreski is this year's Grand Prize Winner. His spectacular photo of an Airbus H125 silhouetted against a beautiful Western Canadian valley bathed in golden light is, we're sure you'll agree, a worthy winner. However, if you take a look through the next few pages, you'll see why picking one overall winner is always such a hard task — we're extremely lucky to receive outstanding images from the best professional and amateur photographers from around the world. Many congratulations to Jeremy, and to the nine other category winners. You can see their exceptional work over the following 18 pages. Take a look at the online edition of this magazine to see more of the wonderful shots sent to us in an extensive gallery of honorable mentions.

What makes a prizewinning photo? This year's contest seems to be full of images that make a clever use of light — as well as the winning photo, a beautifully-lit emergency medical services ramp shot caught the eye, as did the silhouette shot of a law enforcement aircraft as it passed in front of the moon. For the latter shot, photographer John Eggert waited in hope for 40 minutes on a cold January night. Timing may be everything, but patience also has its rewards.

In the Helicopters At Work category, the shots take us into the heart of the action, whether it's from the perspective of a construction worker as a workhorse Kamov Ka-32 brings a four-tonne load into place above us; alongside a rescue tech and a victim as they are hoisted out of freezing water; or looking out of the cabin of an EC145 as its crew performs a rescue on Western Europe's highest peak. Images like these need no words to tell the stories of the wonder of rotary-wing flight.

Finally, the Military category shows these highly specialized machines performing incredible feats at airshows, capturing the imagination and often firing what can be a lifelong passion for those seeing rotary-wing aircraft up close for the first time.

We received over 1,100 entries for this year's contest, which was free to enter, and open to any amateur or professional photographer over the age of 18. We accepted entries through our website from Aug. 16 to Sept. 27, 2019. Each entry was submitted, without the photographer's details, into a digital folder.

We looked through all the entries and picked up to 20 finalists in each of the three competition categories (Beauty Shots in the Field, Helicopters at Work, and Military). These were voted on by *Vertical* staff, as well as representatives from our sponsors: Bell, Airbus Helicopters, Metro Aviation and PHP. We used a secure website, with each voter allowed to pick their three favorite photos in each category. The votes were tallied automatically.

With his photo receiving the most votes, Jeremy has won the Grand Prize of \$1,000, and his photo appears on this issue's front cover. The first-, second-, and third-placed photographers in each of the three competition categories have won prizes of \$750, \$500, and \$250, respectively.

Thanks to our photo contest sponsors for their support, and thanks to everyone who took part!

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BEAUTY SHOTS IN THE FIELD

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MARK MENNIE

Mark Mennie is a Canadian photographer with a primary focus on air medical operations — specifically the crews and their highly specialized transport of the critically ill in both fixed- and rotary-wing aircraft. His work has taken him around the globe, from the hectic pace of Dubai to the desolate landing strips of Australia's Northern Territory. Find his work on Instagram @markmennie and @markmennie.airambulance



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As the sun sets, Arizona LifeLine crews stand alongside the organization's three Bell 407s at its base in St. David, southeast of Tucson. Mennie said this image required a huge amount of coordination, as it required placing the organization's entire on-duty fleet in the same location. He made use of a new concrete helipad, a considerable amount of garden hose to water it to provide the reflection, and had help from off-duty crew members and others to fine-tune the position of groud-based strobe lights for the perfect effect. Mission accomplished!

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BEAUTY SHOTS IN THE FIELD

PLACE

> JOHN EGGERT

John Eggert, 57, is a healthcare professional and photography enthusiast from Altamonte Springs, Florida. He spends his free time traveling and attending car and air shows and carries his cameras with him everywhere. An aviation zealot from early childhood, Eggert was raised in a career U.S. Air Force family, then served in the U.S. Navy aboard an aircraft carrier for nearly a decade.



An Airbus H125, operated by the Seminole County Sheriff's Office Aviation Section, flies a routine patrol over Altamonte Springs on Jan. 21, 2019 — the night of a lunar eclipse. Eggert had set his camera up in his front yard to capture the full moon, but noticed the helicopter flying an oval pattern above the city. He decided to wait to see if the aircraft would fly across the moon. After 40 minutes of waiting in the cold January night, it happened. John took one photo that night: this is the result.



► RICHARD CHAPUIS

Richard Chapuis, 41, has been working with helicopters since 2003. "Being under one of these machines, with the wind, the noise and all the dynamics of a helicopter mission, provides an incredible sensation," he said. In his work as a photographer, he seeks to share the perspective of ground staff during helicopter operations.



Heliswiss International's new Kamov Ka-32A11BC helps to construct a ski lift in the Chamonix Mont-Blanc region of France. Loads weighing more than four tons were assembled with impressive precision, while the power created from the aircraft's 4,500-horsepower engines sent significant rotorwash over the ground crews below.

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HELICOPTERS AT WORK

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VERTICAL MAGAZINE // DECEMBER 2

HELICOPTERS AT WORK



Michal Fanta, 32, is a Czech professional photographer who has been photo-documenting the work and daily life of firefighters and members of other rescue services for many years. He began photographing helicopters thanks to the rescue services that use helicopters for various operations.



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DSA, local emergency medical service personnel, and firefighters undertake aerial rescue training in the Hradec Králové region in the Czech Republic. In the training scenario, the rescuers used an Airbus EC135 to practice hauling a person from the icy waters of the river Orlice in the shortest time possible.

THIRD HELICOPTERSATWORK

PLACE

LIONEL MASBOU

Lionel Masbou, 40, was born and raised in the Pyrenees Mountains. Like his father and brother, he has worked in mountain rescue operations in the French Gendarmerie. Now retired, he has formed his own organization that specializes in aerial work. French Gendarmerie mountain rescuers get to work on Mont Blanc, the highest mountain in the Alps, using one of the unit's Airbus EC145s.

SECOURS EN HOMER

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FIRST MILITARY SHOTS PLACE

► ROBERTO GARCIA

Roberto Garcia, 33, is an experienced aviation journalist and photographer from Colombia. He has been passionate about aviation since he was young and now regularly works with the Colombian Armed Forces on air-to-air assignments.

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Two AH-60L Arpías put their noses down in unison to create a perfect "X" during a demonstration at an air show. The aircraft belong to the Equipo Acrobático Arpía 51 demo team of the Colombian Air Force.

LITER ALTER DE

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⊁ KRIS CHRISTIAENS

Kris Christiaens, 41, is an operator at the Flemish Road Traffic Control Center in Belgium, but he also works as a freelance military aviation photographer. He spends most of his free time photographing military helicopters and aircraft during military exercises, base visits and airshows. He specializes in sunset and night photoshoots, air-to-air photography, and action shots.



An AgustaWestland AH.1 of the British Army Air Corps flies away from a huge explosion during the dramatic conclusion of its demonstration at the Royal International Air Tattoo 2019. During this demo, the Attack Helicopter Display Team (AHDT) showed the aircraft's capabilities, enhanced with ground-based pyrotechnics. This combination makes the British Attack Helicopter Display Team one of the crowd favorites at European airshows.



MILITARY SHOTS

⊁ RAY U

Ray U is a U.K.-based aviation photographer with a new-found love of rotary-wing aircraft. His work is on Instagram @ray_u_photography.



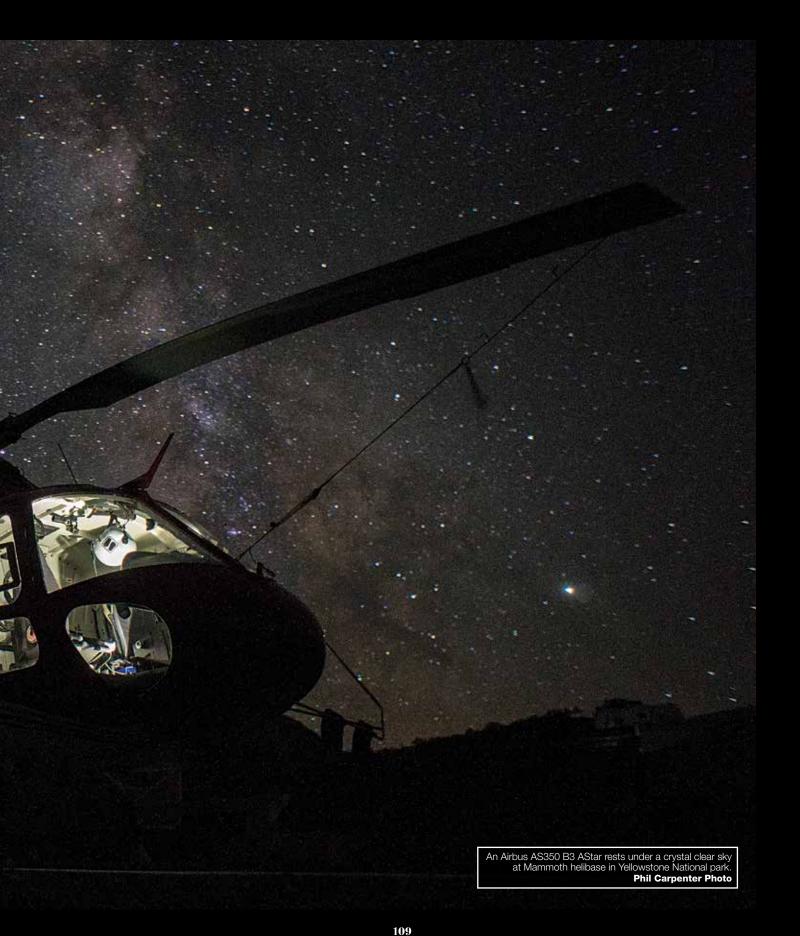
Two British Royal Navy AgustaWestland AW159 Wildcats pop flares at Yeovilton Air Show. The aircraft were taking part in the Commando Assault demonstration, which is one of the main highlights of the show — and also the closing act.



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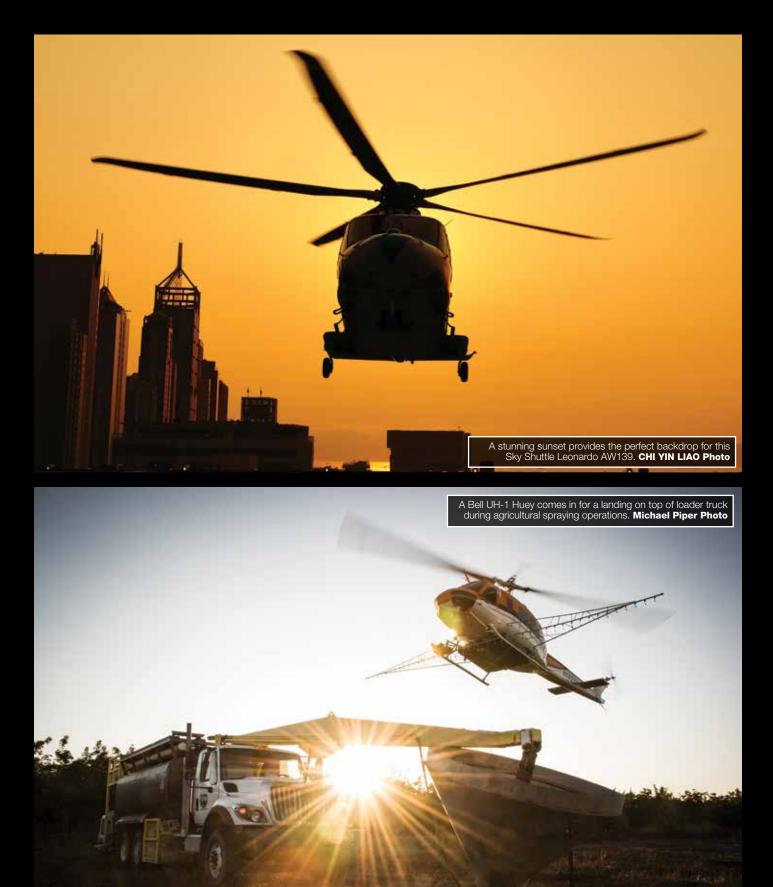












MENTIONS

An AH-64 Apache, attached to Bravo Company, 1-25 Attack Reconnaissance Battalion, shares the spotlight with the beauty of the Northern Lights in Fort Wainwright, Alaska. **Cameron Roxberry Photo**

- 10**7**

An NHV Airbus H145 hoists a technician down to a wind turbine during maintenance operations at a wind farm in the North Sea off the coast of Belgium. **Tom Buysse Photo**

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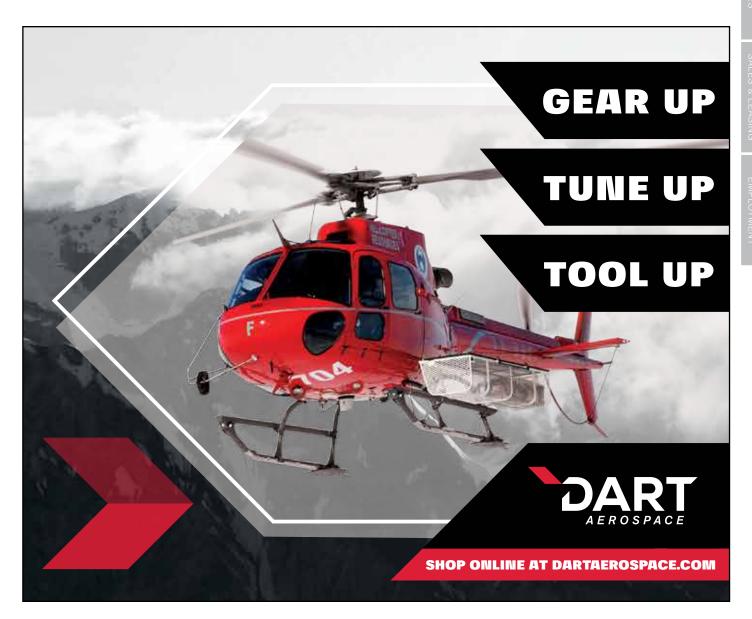


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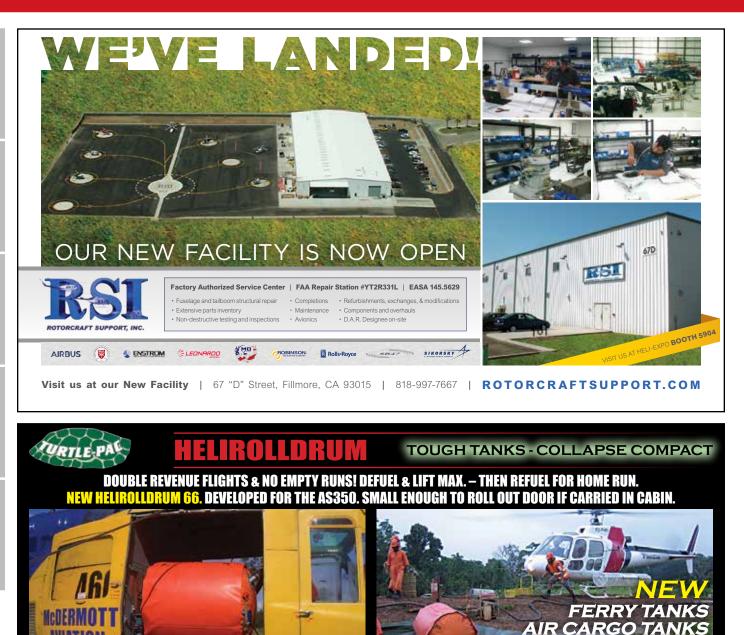
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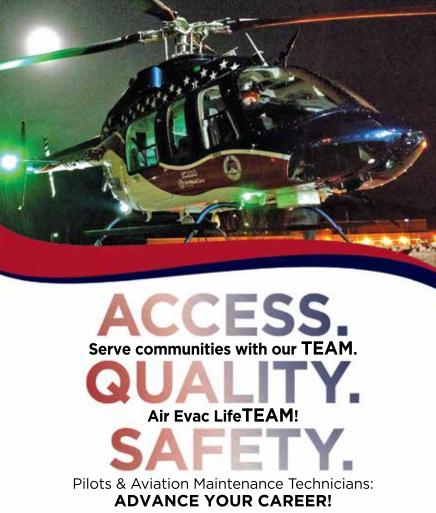
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OLUMN JUSTICE IN THE IDAHO MUD

THERE I WAS... // BY DORCEY WINGO

Inhabitants of the little town of Malad City, Idaho, live with a mysterious booming noise that comes and goes in the rolling hills south of town. When our Bell Huey logging operation moved into Oneida County, we sought out the property owner of our timber lease to explain the strange phenomenon.

It turns out there are ancient underground geysers in this geologically active region of the state, which vent tremendous jets of steam at unpredictable times. Anyone within a mile or two would be forgiven for mistaking such events as dynamite blasts.

Back at the job site, our customer was a good-natured rancher, but said he had stipulations about using his road. His terms specified that we take care in using the halfmile common easement up the hill to the log landing — a dirt road that the rancher said turned to goo in the event of rain. My mechanic must have forgotten about that the night he got stuck; he wasn't what you'd call a "listener."

An unscheduled shower struck after I flew in the last load of logs, but the helicopter landing was a mile down the hill, so I didn't have to deal with the muddy road. Unknown to us, my mechanic (a hotheaded young fellow known to many as "The Menace") attempted to drive the company's oneton service van down that road later that evening.

The Menace hit a stretch of greasy road that tilted left and, not having four-wheel drive, the service van slid off the road and into a ditch. Having no phone in the van to call for help, The Menace got mad and hunkered down for a long, cold night.

Our mechanic was a highly independent sort who didn't have anyone who would notice if he didn't make it "home" of an evening. No wife, no girlfriend, poor rapport with his pilot — no one to miss him. He had gotten stuck less than a mile from an inhabited farmhouse, where most people would have walked to ask for help. But, no.

When our logging crew met at the bottom of the hill the next sunrise, we noted the white service van not far up the hill, off in the ditch. No one had seen my mechanic, not until he came roaring up in his knobby-tired four-wheel-drive truck — headed back up the hill toward the van!

Nena Wilkins, the woman who helped supervise the logging lease with the polite

rancher, was with us when The Menace went tearing up the rancher's road, flinging mud like all get-out. She was a professional logger who oversaw the log landing and was known to take charge when something went wrong.

Nena had forbid driving any rigs up the rancher's road once we left the pavement that morning; it was obvious to most people that the road was unusable. But The Menace had spent a long, uncomfortable night in the service van and was beyond stopping to converse with anyone who had slept in a nice, warm bed. He was going to go get his precious tools and that was that.

Unhappy that no one had come looking for him, the angry Menace had thumbed an early-morning ride back to the campground to retrieve his truck. He then churned back up the hill, determined to secure his tools from the marooned van.

He charged up the hill on the rancher's gooey road, countless biscuits of mud flying around like frogs on a hot stovetop. Nena, a woman known to slash off her own hair with a dull kitchen knife, stood in disbelief at what The Menace was doing to the road.

I could sense Nena starting to inflate. The self-appointed "Chewer of Asses" for our

logging operation was more than ready when The Menace stopped — probably to complain about what a crappy night he had and whine about not having a four-wheeldrive service vehicle with a satellite phone.

Nena snapped. The Menace never had a chance to get a word in. Her assessment of the situation that muddy morning was not something I can reproduce on paper.

Observers of this exchange might have been reminded of the old *Sgt. Bilko* TV show, where actor Phil Silvers chewed butt frequently and efficiently. Visions of Gunnery Sergeant Hartman, played by R. Lee Ermey in *Full Metal Jacket*, also came to mind. That Marine could really sink his teeth in and thrash. But bless his soul, he couldn't hold a candle to Nena, "The De-nutter."

On that boggy morning in June, Nena met The Menace head-on. She screamed acid-laced obscenities, expectorating and thrashing her extremities, silencing The Menace's lame excuses and the nearby booming hills for a moment. The Menace retreated to his camper where he stayed until the rancher's road dried up, and the booming in the hills resumed. \Im





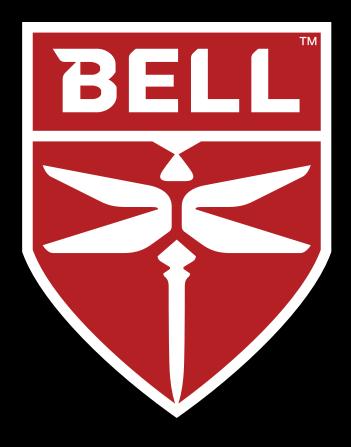
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