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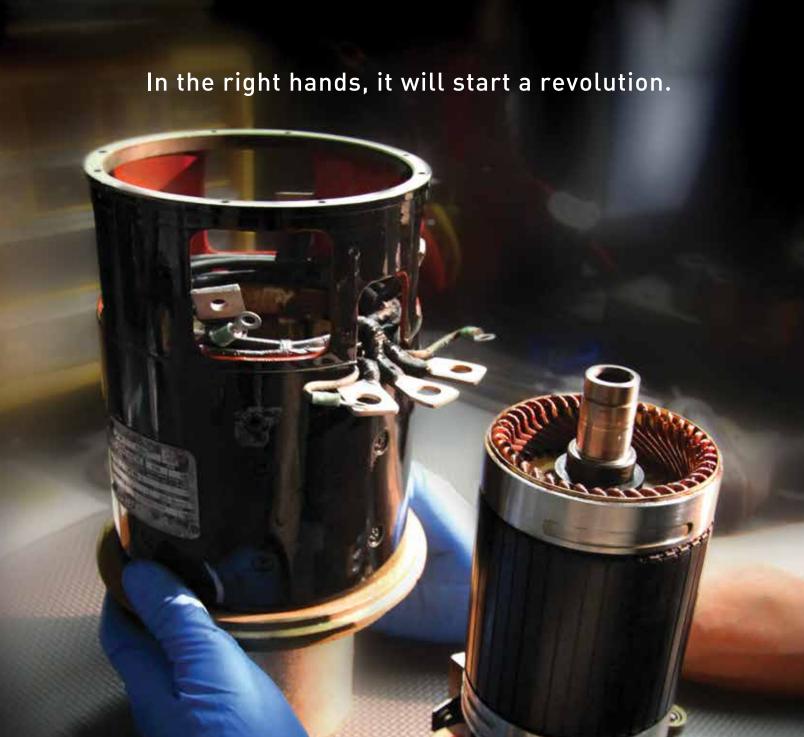
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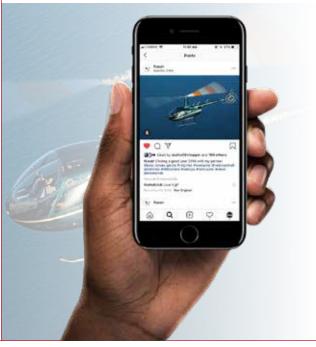
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erticalmag.com // august/september // volume 18, issue 4



MHM

IN CANADA:

500 Trillium Dr., Unit 23, Kitchener, ON N2R 1E5

IN THE UNITED STATES:

701 S. Main Street, Fall River, WI 53932

PUBLISHED AND PRODUCED BY: MHM Publishing Inc.

SUBSCRIPTION INQUIRIES CALL TOLL-FREE: 866.834.1114

Vertical Magazine (ISSN 1703-8812) is published six times per year (Dec/Jan, Feb/Mar, Apr/May, Jun/Jul, Aug/Sept, Oct/ Nov) by MHM Publishing Inc., paid at Fall River, WI.

Postmaster please send address changes to: Vertical Magazine, PO Box 8, Fall River, WI, 53932.

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© Copyright 2019 MHM Publishing Inc. International Serial Number ISSN 1703-8812

Canadian Publication Mail Agreement Number: 40741549

Postmaster: If undeliverable, return mailing label only.

Printed in U.S.A.









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COLUMN

LET'S GO FISHING!

FOCUS ON SAFETY // GEOFF GOODYEAR



Looking at the title of this column, you may be wondering what fishing and flying have in common. Well, having worked in one of the world's best salmon fishing areas, I have made several observations on the similarities of the two. From a behavioral perspective, fishing and flying seem to have the same passionate hold over their purveyors, and pound-for-pound, the equipment for the two activities is probably the most expensive on the planet!

For the purpose of this discussion, we shall focus on equipment. In past columns I have recounted stories from my family, with my grandfather and his surviving brothers from the First World War featuring heavily. They were mavericks all, and some were given to impulsive behavior. So it was that when Great Uncle Joe saw a photo of a fisherman with a giant bluefin tuna (weighing in at about 700 pounds), he knew he had to catch one.

He began by researching the equipment and expertise necessary to catch one of these giants of the sea. A cursory review of the process showed a specially designed boat with a very complicated articulated chair at the stern. The chair had the appropriate restraints to allow for a 150-pound human to battle a 700-pound tuna, as well as mounts for fishing tackle, composed of sturdy rod, line and hook.

Uncle Joe was not one to dwell on details regarding equipment, and always kept a broad high-level perspective on such matters. His construction company had a boat, he had lots of chairs at his office, he had several leather belts which would suffice as restraints, and he was confident that rod and reel could be acquired without difficulty.

Well, he was right about the ease of acquiring rod, line and reel. There were several tuna boat captains more than willing to part

with their old broken tackle, and they were thrilled that someone was willing to pay for it before it went to the dump.

The process of sending Uncle Joe into the history books began. The company's boat, the Sylvia Joyce, was made free of work commitments for the period, and made ready to wreak havoc among giant tuna everywhere. An old oak office chair was sourced from the office and lashed to the stern of the Sylvia Joyce with about two kilometers of tarred marline.

Now, to explain, tarred marline is no ordinary binding. Made of heavy twine that's dipped in tar (which acts as a preservative against the elements), it's sticky, smelly, and dirty. It's also not much thicker than dental floss (though I wouldn't recommend using it for that purpose) and it is most certainly not suited to the structural securing of chairs to decks.



In retrospect, retelling the story now sounds like a perfect example of Dr. Reason's Swiss Cheese safety model. No incident has a single cause — it requires a bunch of variables to line up.



The next stage of the conversion saw several of Uncle Joe's leather belts, in concert with an old car seatbelt, pressed into service to secure him to the chair. To complete the ensemble, he had a very old rod/reel combo fitted with rotting line and an expendable hook. The only new and serviceable part of the whole affair was the poor mackerel they caught to use as bait.

So began operation "How To Tuna Fish" (with apologies to any musicians out there). The Sylvia Joyce departed the wharf and set off on its great adventure. Several people were on board, including, of course, Uncle Joe, who was full of determination and anticipation. The rest were there in support and to act as credible witnesses should the venture take a sour turn.

All on board, except Uncle Joe, were secretly hoping that no fish would be encountered (the captain of the vessel was under strict orders from the family to stay clear of any obvious schools of tuna) and that Uncle Joe would grow weary of the venture and order all hands to shore. To everyone's horror, it only took Uncle Joe and that poor mackerel a couple of hours to attract a Bluefin giant and hook it.

There was incredible excitement at the stern of the boat as Uncle Joe strained against the tackle on one side and the oak office chair on the other. It was not pretty to watch, as he was trying to play and land this giant like a Pudops Lake trout. The whole scene was a sight to behold. This determined human fighting a giant fish, with the two held together by a series of weak links.

St Andrew, the patron saint of fishermen, was surely watching, and knew this would not end well. After about 10 minutes, he intervened. The rotting line on the old reel gave up and parted company with the whole affair.

Uncle Joe was indignant, and made sure everyone within earshot knew it. The rest on board breathed a sigh of relief as Uncle Joe was safe, no police reports would be necessary, and the family were most thankful to St Andrew. And, of course, there is the fact that no one involved had actually thought through how they would ever get a 700-pound tuna on the deck of the Sylvia Joyce. No doubt the tuna was happy enough as he got to keep the mackerel.

Let us review the physical systems and equipment used here. Had the tarred marline broken away from the deck, the Uncle Joebelt-chair combo would have been thrown into the ocean, and he would have been towed across the Atlantic — for he would never have let go of the rod. Had one of his leather belts broken, he still would have been towed across the Atlantic — but would have been far more streamlined without the chair attached (so it would have been a quicker trip to Europe). Thankfully, we had the most merciful of outcomes, but when dealing with fishing or flying, that is not always the case.

In retrospect, retelling the story now sounds like a perfect example of Dr. Reason's Swiss Cheese safety model. No incident has a single cause — it requires a bunch of variables to line up. I know our equipment and accessories cost a lot, but sometimes it truly pays to make sure you have the right equipment for the job.



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COLUMN

IS DECISION-MAKING TRAINING BORING YOU?

FOCUS ON TRAINING // ANDY ROE



IBM CEO Ginni Rometty says that one-third of the decisions humans make are great; one-third are not optimal; and one-third are simply wrong. According to that theory, if pilots were taught only basic helicopter control and nothing else, then two-thirds of all decisions made in flight would be wrong or less than ideal.

Helicopter students need to learn how to make better decisions than the average person. Flying with a pilot whose only skill is good control would be a risky venture, and the percentage of good decisions in the cockpit is directly proportional to time spent teaching student pilots how to make good decisions in a training program.

Decision-making training can be vague and confusing, especially for younger student pilots who feel they are invincible in a car and will be invincible in a helicopter. The importance of learning how to make informed decisions is difficult for students to come to grips with, and the internet is not much help with its myriad of information about aviation decision making, human factors, situational awareness, single-pilot resource management and more. The information is overwhelming and invariably creates a fog of complicated words, phrases and explanations often laced with perplexing acronyms. Rather than attending decision-making ground school, students would much rather just go flying and then go home.

Storytelling is a good way to make decision-making training more interesting and ensure important information is retained.

For example, one helicopter pilot told me about a time she was parked at the bottom of a mountain. It was an unstable, loggedout area with steep slopes, littered with slash and debris. These objects are referred

to in industry vernacular as torpedoes, because, if unstable, they can suddenly launch themselves down a hillside. This pilot had an uneasy feeling that prompted her to move the machine to a location away from the slope.



Young people aspiring to become helicopter pilots should be aware that social trends can have a detrimental effect on their ability to make informed decisions in the air.



Sure enough, shortly after she moved, a torpedo shot down the hill and landed where she had been parked. She had felt that something just didn't seem right, and her good decision-making skills prevented what could have been a major incident.

Listening to a monotone instructor talk about the importance of decision making is soporific, and simply telling pilots to make better decisions is not as effective as using image-provoking storytelling to encourage them to be safe. Even when questionable stories turn out to be "fake news," we can often extract a positive decision-making lesson.

Experienced pilots tend to make better decisions than students, but rule-based decision tools can help.

"Get-home-itis" is a problem in general aviation because human pilots — yes, we still have those for now — have a strong desire to continue to their final destination, even if weather is deteriorating or fuel is running low. Studies have shown that people who prioritize an outcome will attempt to achieve that result at all costs. A rule-based decision would be to plan for a safe landing at the end of the flight, and it would prioritize

a safe landing instead of achieving the final destination. This represents good decision making and reduces the possibility of "gethome-itis."

I have ended up in places that were less desirable than my planned destination many times, due to bad weather or other problems. I have stories to tell of time spent at "alternate destinations" over the years, even remote areas where I waited hours for the weather to improve or another helicopter to arrive with a new starter or generator. Ironically, many of the times spent at planned destinations leave just a vague memory, at best. Living to tell stories about a flight is high reward, no matter where you end up.

A social/technological trend these days that may be affecting our ability to make good decisions is artificial intelligence (AI). For example, while texting with her husband, a woman received a message that seemed uncharacteristic, compared to how he would normally write. As it turned out, an algorithm had provided her husband with a few pre-written responses, instead of leaving him to create a response on his own.

Amy Webb explains in her new book, *The Big Nine*, that Al might be slowly relieving us of the need to think. She writes about how her car stereo automatically decreases its volume for safety when she backs the car into the garage. These high-tech developments, however, might be taking care of things that should remain in our control.

Optimistic bias can hamper good decision making as well. A person's optimistic belief that they are less likely to experience a negative event compared to someone else, is not always realistic.

Young people aspiring to become helicopter pilots should be aware that social trends can have a detrimental effect on their ability to make informed decisions in the air. Are social trends hampering student pilots' abilities to make good decisions? You would think that modern trends would advance the human capacity for learning, but maybe the "good old days" were a better time.

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COLUMN

PREVENTION IS BETTER THAN CURE

FOCUS ON MAINTENANCE // JOHN CARINHA



Preventative maintenance is intended to be an ongoing process in which one invests a nominal amount of time and money to avoid a larger and more unexpected investment of time and money if/when a problem arises. One process is planned, the other, not so much.

Living and working in an industry governed by policy, regulations and procedure, we are tuned to follow these protocols so that the aircraft we maintain are always kept current in terms of their serviceability. Reported faults are dealt with on a daily basis and unreported faults are usually discovered during routine maintenance cycles. There is a method to the madness that is aviation maintenance, and there's one glaring reason for it: when things don't go right or are not done right in aviation, it can result in the ultimate penalty.

Every summer I plan a fishing trip to the north end of Vancouver Island. These trips often run seven to 10 days and are fully focused on catching a variety of fish and seafood. In order to do so, a seaworthy vessel is required to access the remote and distant waters that fish thrive in.

Second to my children, my boat is my pride and joy. I take great pleasure in using her well over 10 months of the year, and then spending the remaining two months putting her through the paces of her annual maintenance routine. I check and replace all fluids, filters and test all systems to ensure they are operational. Up until two weeks ago, my maintenance system was bulletproof — or so I thought.

In advance of my trip, I had a weekend of preventative maintenance planned. Trailer bearings and brakes would be checked, engine oil and gear oil changed out, and I'd put an extra coat of wax on the hull for good measure. However, before I began, I was distracted by a fishing report for our local waters that detailed how good the fishing was. I had to go. After all, it was just one more quick day trip before turning my focus to maintaining my boat.

As I exited the marina, I positioned myself over a 200-foot contour and readied my gear, set my lines and began trolling for the highly coveted chinook salmon. I had high hopes, a positive attitude and my luck... was still to be determined. Less than 10 minutes into my first pass, my engine began emitting a sound reminiscent of a train. Her idle rpm was normal but the sound was not. It was faint and subtle, but very much present.

I scanned my engine instruments: 40 psi on the oil pressure, 175 degrees on the engine temperature, 14 volts on the voltmeter, I had full fuel and there were no alarms or warning lights. I opened the throttle slightly to hear her response, and it was normal. I returned her back to idle and less than two minutes passed before she shut down. I was fishing a deep shelf, but I was close to the shore. The wind was up and I needed to get my auxiliary motor running to avoid ending up on the rocks. I had my anchor ready to drop in the event the auxiliary wouldn't start, but thankfully it did. In the short-lived chaos that ensued, I got her under control and under power and sat back to assess what had happened.

I tried to start my main engine, but she wouldn't even so much as turn over. My voltmeter still read good battery voltage, but something was severely amiss. I took the engine cover off and pulled the oil dipstick. It was a beautiful satin metal finish... and dry to its tip. A plume of steam wafted out of the tube from where had I pulled the



Living and working in an industry governed by policy, regulations and procedure, we are tuned to follow these protocols so that the aircraft we maintain are always kept current in terms of their serviceability.



dipstick. It was clear. The engine had run out of oil and seized.

I was beyond perplexed. No low oil light or alarms sounded. There was no presence of oil in the bilge, nor in the exhaust water. Five liters of oil over the course of the season had been consumed, but how? As of this writing I still do not have the answer, as I await a new engine block.

I limped into the dock that day on my auxiliary motor. I felt dejected as I got back to my cabin and walked into the garage. I stared blankly at the plastic bin of oil and filters and my oil pump — all the things necessary to perform the maintenance that would have prevented the events that had just transpired.

The circumstances of this experience still afforded me options. I had "outs" and safety nets that ensured my well-being and survival. But in our industry, a low oil situation or seized engine in flight can have a catastrophic outcome. It is this measurable and tangible level of risk that dictates the maintenance programs we and aircraft manufacturers adopt to keep the aircraft we are responsible for serviceable, and our crews safe.



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COLUMN

WHEN MANAGEMENT STILL DOESN'T GET IT

FOCUS ON LEADERSHIP // KIM HUTCHINGS



As someone dedicated to improving safety culture in the helicopter industry, I attend numerous safety events, participate on committees, teach classes and speak about the topics of culture and leadership.

Recently, I attended a helicopter event where a senior manager spoke to the audience about a new system that had been implemented in his operation to help improve safety and reduce risk. The company put a lot of hard work and, no doubt, money, toward the development and implementation of this very impressive system.

In my opinion, there was no question that the management of this company cared about the safety of their staff and were doing what they could to put safety first.

I have found there are many companies where management tried to instill a safety-first culture, but here's where the problem starts: when frontline employees are out on their own, it may not always be "safety first."

We know this because we are still seeing accidents that indicate safety wasn't the first priority. It's not that the pilot doesn't want to be safe, but accidents happen because of other factors.

My business allows me to spend time with pilots from all over the world, and people from different companies and different sectors of the industry. It also allows me to spend time with people in safety and upper management positions, and I will tell you this: there is a big disconnect between the office and the field!

Without pointing fingers, let's focus on that disconnect and where it may create gaps, and then let's look at how we can help close those gaps.

I often see operations and safety managers working hard to create an environment

that encourages safety and decreases risk. They do this by encouraging reporting, creating a dense and comprehensive safety manual, and training employees on processes and procedures.

However, the problem that I see repeatedly is not with the systems or manuals; not the "things" that are done to improve safety. What I see as a big glaring gap in creating a safety-first culture is the managers — the leaders themselves, their lack of strong emotional intelligence and leadership skills.

What does this have to do with safety and the gap between the office and the field?



Really listening may be harder than it sounds, but doing so with your own employees will give you invaluable insight into what is — and isn't — working at your company.



Leaders must be able to listen and empathize with those in the field. Instead, what I see often from leaders is a lot of telling and not enough listening — a lot of, "Do it this way, because..." instead of putting themselves in the place of frontline employees.

I know there's lots of wisdom, trial and error, expertise and trailblazing in the helicopter industry, which can lead to a "father-knows-best" mentality from those in management positions. But things change, equipment and processes improve, general knowledge is increased and people see things differently today than we did previously. That means father may not always know best.

I believe listening and empathizing with frontline employees must be at the top of the list for creating a strong safety culture. Really, truly listening and being open to what people are saying will give managers a huge advantage in safety. This includes not only listening to your own frontline employees, but also paying attention to what others in the same jobs are saying.

Here's an example: A manager was speaking about his company and the things they do for their safety culture when a pilot in the audience spoke up and said, "That's really great. Our company supports a strong safety culture as well, but, in my experience, I have found that it's when I'm in the field working with other pilots and crews that things go wrong.

"I have personally made decision-making mistakes in the field that I would not have done, except due to the pressure and what happens in the field."

The manager basically cut him off and said, "Yeah, well that's not our operation. We have a Just Culture."

Hmm. Well, if you just dismiss an experienced pilot who you don't really know, but who makes a sincere comment and relevant contribution to the discussion, then how do you treat your own staff?

This was a perfect opportunity for the manager to ask this pilot, who was speaking honestly, about what he had experienced in the field. What led him to make the poor decisions, even though he knew the safety standard at the organizational level would have been against it? What pressure did he feel in the field from his co-workers that was different than in the office?

My point is this: it would have been a great opportunity to listen and learn in order to, perhaps, confront some of the problems that may be happening in the field in his own operation. Really listening may be harder than it sounds, but doing so with your own employees will give you invaluable insight into what is — and isn't — working at your company.



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THE WORLD HAS CHANGED... MIGHTILY

FOCUS ON OPERATIONS // COREY TAYLOR



As a pilot who has always dabbled in management to various degrees, I am no stranger to the rust that develops when one has been flying the "mahogany slab" for a while (or, as we say in Canada, the beech-veneer particle board slab). But, after a hiatus of several years, I am now back in the field and, in fact, writing this from the pilot's seat as I sit at a repeater site on top of a mountain. The reasons I am at this repeater are legion, but the tendency for clients to demand years of experience for entry-level jobs is chief amongst them. The failure of operators to bring in enough new pilots, preferring instead to poach from their peers, is leading us down a spiral I feel we will regret mightily over the next few years. But, for the moment, I am enjoying the view from up here.

A lot has changed in the eight years since I last did a full tour in the field. There are way more FADEC-equipped helicopters now, a few more modern twins than there used to be, rates are down, wages are up (you'll never get a pilot to believe any of that, but facts are facts, everywhere but in Washington) and clients are as difficult as ever.

Probably the biggest single change for me, from the last time I crewed an aircraft, was the onslaught of ground training, the likes of which would have Moses believing he was getting off easy having to deal with frogs and locusts. Almost 50 hours of online training and exams. Fifty! A work week is supposed to be 40, so I spent better than a week watching videos, clicking through PowerPoints and then doing guizzes. Was I a better pilot at the end of it? I really don't see how being taught the proper use of a ladder and how to tell bears apart helped me advance my knowledge, but perhaps that's due to the requirement for a one-size-fits-all

program, driven by a regulator that values quantity over quality. After this experience, and considering the many complaints I've received from pilots of exam-overload, I will try to get our training department to tailor-make programs for the experience level of the crew. What will benefit a 20-year-old with 150 hours, will likely mean nothing but wasted time to a 40-year-old with 8,000 hours.

In contrast to today's attempt to have everyone learn from a screen in order to avoid lack-of-knowledge mishaps, in my career, I learned everything the hard way. The kind of training seen today was never even contemplated 30 years ago, and the type of self-teaching I embraced tends to



This new electronic cockpit will certainly take workload off pilots of any experience level, and probably the most from those new in the seat.



be a source of price for those that survived. Of course, I wish I was told in advance that while using Scotch-Brite to clean the bugs off your windows only takes two minutes, using cut-polish afterwards to enable light to pass through the badly scratched plastic will take hours. But sometimes those lessons need to be driven home with a sledgehammer. The goal becomes not simply to avoid repeating the mistake, but instead to find new and exciting ways to make mistakes.

Probably the biggest change from when I was last active and now, aside from the two acres of trees used for the exams, was the lack of paper in the cockpit. No maps.

No flight supplements. No ops manuals. Just tablets that have all the info you need at the touch of your fingers. This is a great advancement. Frankly I'm surprised the regulator allows it, since they tend to be 25 years behind industry in this country (I am told they are still requiring RNAV to be taught to ab initio students, who will then have to visit a museum to actually find any of these devices they had to pay to learn about), but sometimes blind chickens find corn, as they say south of the border.

It is so nice to fly in the fickle mountain winds, with the sand becoming airborne as you get pounded in the passes, and not have to be folding your damn map while holding the stick with your knees! So nice not to have your map sucked out the window while holding it too close trying to determine your position. So nice to have up-to-date frequency information, so you never have to be roasted by the tower while all your peers listen to your humiliation. Never again will you be confused by a lake on the ground that isn't on your map, because they built a dam five years ago, but the charting people have somehow managed to miss it!

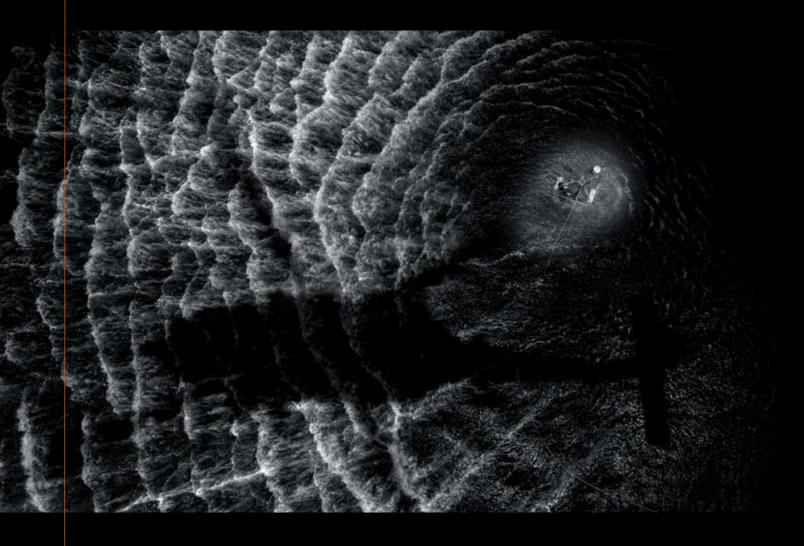
I experienced all the above, and a small sampling of many similar events. I know many of my peers share these types of experiences.

This new electronic cockpit will certainly take workload off pilots of any experience level, and probably the most from those new in the seat. Perhaps this reduction in stress alone will help bring down the incident rate, although it will be exceedingly hard to prove. At the very least, being free of paper clutter and out of date documents will allow pilots to focus on the important things, like fuel planning, weather management, where to put your damn tail and when to stay on the ground.

I'm looking forward to the season.



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Vertical DAILY TOP

Here's a recap of our 10 most popular online stories since our last print edition was published.

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First public demonstration of the S-97 Raider highlighted its speed and unique maneuverability.



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BY ELAN HEAD

On July 17, Leonardo's TH-119 helicopter became the first single-engine helicopter in decades to achieve instrument flight rules (IFR) certification in the United States.

Leonardo had a strong motivation for getting the job done. The company is entering this variant of the AW119 in the U.S. Navy's lucrative TH-73 (formerly TH-XX) training helicopter competition, for which IFR certification is a requirement. But Leonardo also had a unique advantage going into the certification process - the fact that the single-engine AW119 is derived from a twinengine, IFR-certified helicopter, the AW109.

Since 1999. IFR certification of singleengine helicopters in the U.S. has been stymied by Federal Aviation Administration (FAA) guidance that requires applicants to demonstrate regulatory compliance using numerical safety analysis methods. As several industry organizations - including Helicopter Association International (HAI) and Vertical Flight Society (VFS) explained in a 2015 white paper, the FAA set an extremely high bar when it selected the methodology and numeric values in this guidance.

Most single-engine helicopters are certified as Federal Aviation Regulations part 27 normal category rotorcraft, which have generally lower safety standards than part 29 transport category rotorcraft. For IFR certification, however, the numerical safety analysis requirements were equivalent — generally necessitating the type of redundant systems that are common on transport category helicopters, but rare on normal category ones.

The authors of the white paper argued for relaxing IFR certification standards for part 27 rotorcraft, pointing to the number of fatal accidents caused by visual flight rules (VFR) pilots' inadvertent flight into instrument meteorological conditions (IMC). Because IFR flight is demonstrably safer than scud running, increasing the availability of IFR helicopters would yield safety benefits to justify the looser standards, they said. Moreover, they added, the recent availability of modern digital flight displays makes IFR flight easier and more accessible than ever.

"In the last decade or so, with the advent of glass cockpit avionics and the digital architectures in aircraft, it's become much more affordable and much lighter weight to install [these] into small helicopters," echoed TH-119 campaign manager Andrew Gappy. "Glass cockpits really provide an incredible amount of information."

In June 2017, the FAA published a policy statement that eased numerical safety analysis requirements for various classes of part 27 rotorcraft, but did not address single-engine IFR requirements directly. That meant that when Leonardo decided to pursue IFR certification for its TH-119, the most straightforward path for doing so was still to conform with the redundant systems found on transport-category helicopters - including dual hydraulics, dual stability augmentation systems (SAS), and dual pitot-static systems, among others. Retrofitting these onto a helicopter certified without them would be a huge engineering challenge, but because of the 119's lineage, most of the requirements, or at least provisions for them, were already in place.

"When we looked at the requirements for a part 27 aircraft, we were fortunate because we had an aircraft in the 119 that was a derivative of the 109. It has all the system redundancies that were required for IMC," Gappy said.

One redundancy missing on the 119 was a second generator, but even here Leonardo lucked out. "We had actually installed [an] auxiliary generator for a customer up in Canada that does geological survey. So it's an existing STC [supplemental type certificate] for the 119," Gappy said. For IFR certification, Leonardo installed this auxiliary generator, which will automatically pick up the entire electrical load of the aircraft if the primary generator fails.

Coincidentally, around the time the Navy issued its TH-XX requirements, Leonardo was in the process of equipping its AW109 Trekker with a Genesys Aerosystems glass cockpit, which was readily transferred to the TH-119. For its submission to the Navy, Leonardo settled on a four-display cockpit layout as an optimal training configuration. However, the aircraft is certified for single-pilot IFR operations, and only the two displays on the right-hand side are required from the FAA's perspective.

Gappy said that the developmental testing and FAA certification process for the TH-119 were relatively straightforward. While FAA Aircraft Certification Offices often provide STC applicants with "issue papers" addressing perceived deficiencies in their certification plans, "We had no issue papers, which speaks directly to the strength of what Genesys and Leonardo proposed," Gappy said.

Nevertheless, he described the FAA as "very thorough" in its evaluation of the aircraft and IFR package. "Trust me, it was not lost on the FAA that signed off on this that this is the first single-engine IFR [helicopter] in decades!" he said.

According to Gappy, because the IFR approval is a civil certification of a civil aircraft, "there is nothing from a configuration or certification perspective that doesn't avail it to the civil market." Although he declined to comment on any specific plans Leonardo might have for the IFR package in the civilian world, he described the new market entry point for IFR operations as a "great thing."

"It's absolutely the safer way to fly," he said. "Now that there's a single-engine IFR-certified aircraft that the civil market can get their hands on, it enables more IFR flying."

While Gappy — a former U.S. Marine Corps helicopter pilot who served in the HMX-1 Presidential Helicopter Squadron is strongly in favor of expanding helicopter IFR operations, he said he would be wary about doing so at the expense of flight critical system redundancies.

"When you're actually in IMC, the margin for failure is so much smaller because you don't have reference to the ground," he said, giving the example of how a hydraulics failure in a single-hydraulics aircraft could disconnect the SAS, greatly increasing the pilot's workload in challenging conditions.

"It's one thing to go out and say, yeah I can handle a hydraulics hardover in IMC, if that happened, if I don't have another system to back it up. That's fine that you can do it with thousands of hours. But what about the average pilot who's only got a thousand hours or less? Because now you're creating a potentially catastrophic situation which could have been easily handled by requiring a second hydraulics system. That's where I think we have to be careful that we don't inadvertently infuse more risk in it than we're trying to avoid."



RotorBits



MILESTONE EXPANDS

WORLD'S LARGEST S-92 FLEET

Milestone Aviation Group has acquired a Sikorsky S-92A, bringing the company's total S-92A fleet to 79 aircraft. Milestone said the purchase illustrates its ongoing commitment to the type, which is the primary aircraft servicing the offshore oil-andgas industry as well as serving search-andrescue and executive transport.

"The S-92A is the cornerstone of our oiland-gas portfolio and, given the size and scale of our fleet, we believe we are uniquely positioned to manage these assets and provide optimal fleet and support solutions for our customers and the overall industry," said Pat Sheedy, managing director of portfolio and underwriting at Milestone.

Milestone's owned and debt-financed fleet of S-92A helicopters accounts for more than 30 percent of all S-92A aircraft in operation globally.

HAI CALLS FOR SALUTE TO

EXCELLENCE NOMINATIONS

Helicopter Association International (HAI) is now accepting nominations for its Salute to Excellence Awards. The annual awards recognize outstanding achievements in vertical aviation.

Nominations can be submitted online at rotor.org/salute. Anyone may submit a nomination, and anyone may be nominated. HAI membership is not required.

Winners will be honored at the Salute to Excellence Awards at HAI Heli-Expo 2020 in Anaheim, California. Because of that show's early dates, the deadline to submit nominations is Aug. 30, 2019.

COULSON BRINGS NVG FIREFIGHTING TO THE U.S.



Coulson Aviation USA is to bring its night vision goggle (NVG) aerial firefighting program to the U.S., having secured a contract from Orange County Fire Authority (OCFA) in partnership with Southern California Edison.

The Next Generation Aerial Operations Based Pilot Program is a 150-day night aerial firefighting program that is structured similarly to Coulson's successful program in Victoria, Australia. It will use a Sikorsky S-61N capable of hover-filling 1,000 US gallons of water at night from the nearest available water source or portable tank, and a Sikorsky S-76B for intelligence-gathering operations and as a supervision platform.

The S-61N will provide night fire suppression, working in coordination with the S-76B for risk/benefit decision-making.

The S-76B is NVG-equipped and is fitted with an HD thermal imaging camera to assist in the safe management of night fire suppression operations and hot spot detection.

"This Night Program is an extension of the excellent work started in Australia by Emergency Management Victoria, National Ariel Firefighting Centre and [the] Civil Aviation Safety Authority," said Wayne Coulson, CEO of Coulson Aviation Inc. "We believe we have a safety-first night firefighting operation that will benefit the firefighters and communities we serve."

This new asset is operating under an exclusive-use contract with OCFA and available to respond on a seven-days-a-week, 24-hour basis to fire agency requests within Southern California.

"This . . . is an opportunity for Edison to accelerate the first U.S. deployment of this innovative firefighting technology," said Chris Thompson, Southern California Edison's vice president of local public affairs. "Since more than a third of our service area is located in state-designated High Fire Risk areas, it's essential for us to regularly partner with fire authorities on groundbreaking programs like this."

OCFA fire chief Brian Fennessy said the program could be a "game-changer" for firefighting operations. "Fighting wildfires at night is optimal because weather conditions are more favorable — temperatures are down, humidity up and winds typically lighter," he said. "The ability to have this aerial resource that can precisely drop large volumes of water on a fire will make

a significant difference. And the ability to measure its effectiveness will help us determine if the success outweighs the risk."

Separately, a 45-foot Prevost Command Center that hosts team members of OCFA, WIFIRE and Coulson will provide the University of California San Diego (UCSD) WIFIRE program with real-time fire maps being produced from the S-76 Firewatch helicopter while over the fire.

The UCSD supercomputer will forecast where the fire direction is predicted to go and identify for fire leadership the risks and hazards for firefighters and communities.

Intterra, the provider of cloud-based software for firefighting agencies, will be a key integration team member, working with Coulson, OCFA and WIFIRE to move the intelligence gathered to the proper leadership.

"I appreciate and thank Chief Fennessy for the coordination and leadership he has provided to integrate this multi-faceted technology package into building a safer workplace for our firefighters and flight crews while providing greater protection for our communities," said Coulson.

UTILITY SUPER PUMAS ARRIVE IN CANADA



BY OLIVER JOHNSON

Three Airbus AS332 L1 Super Pumas have arrived in Canada to begin a new life as utility/ firefighing aircraft with operators Helicarrier Helicopters and Coldstream Helicopters.

The three were purchased by Quebec City, Quebec-based Helicarrier in late 2018 and early 2019. The operator then reached an agreement with Coldstream, based in Kelowna, British Columbia, to sell one of the aircraft to them.

As the Super Pumas had sat idle from their previous work as offshore transport aircraft for the last three years, they required some work to make them airworthy and transform them into utility aircraft.

"We had to uninstall a lot of the kits that were installed on the aircraft because they were Australian STCs [supplemental type certificates] that were not recognized here, as well as its offshore interior that needed to come out," Fred Carrier, Helicarrier's co-president, told Vertical. "The aircraft have been sitting since 2016, so there were a lot of ADs [airworthiness directives] and SBs [service bulletins] to complete to get them back up to date."

The first aircraft received its Certificate of Airworthiness from Transport Canada in early June, and since then, it has already travelled to the Arctic and back and worked on powerline construction in Ontario.

HeliCarrier is a heavy-lift specialist, also operating three Sikorsky S-61Ns, as well as four Airbus AS350 AStars. All aircraft in the fleet are owned by the operator.

Carrier said the Super Pumas will be used for the same range of utility work as the company's S-61s currently perform; a list of work that includes construction, firefighting, and general heavy lift operations.

The Super Puma has a similar lifting capability to the S-61, said Carrier — with the ability to

carry around 9,600 pounds (4,350 kilograms) on the hook.

"The Super Puma has got a lot of power," he said. "It performs really well in hot and high conditions, where older aircraft like the 61, which has got less power, they lose that performance really quickly above 8,000 feet."

Carrier also praised the aircraft's speed, and said he hoped the aircraft would prove as reliable as his AStars.

The training for Helicarrier's staff has been completed in-house, with a couple of the company's pilots already having extensive experience with the type.

Helicarrier is still working on the final AS332, and hopes to put it into operation in the fall. Carrier said he would consider expanding his company's Super Puma fleet if there is a stable stream of business to support it.

Coldstream has also begun operations with its Super Puma, which it has converted into a Firecat. The operator had been looking to get into heavy-lift work for a little while, company president Rob Gallagher told Vertical. After looking into (and then deciding against) the Sikorsky S-70i Firehawk, he explored the idea of using a Super Puma after chatting to Heli Austria's Roy Knaus.

"The AS332 L1 Super Puma is pretty much identical to the Firehawk in terms of capacity, weight, speed, and capability, and is type certified and readily available," he said. "Plus, they still make lots of them and they're civilian certified."

The conversion of Coldstream's Super Puma into a Firecat has followed a similar process to that completed by Heli Austria's aircraft, gutting the instrument flight rules aircraft and turning it into a highly efficient utility/firefighting machine.

"The only thing we've done differently is take it one step further with the development of belly firefighting tanks and NVG [night vision gogale] capabilities for night fire operations," said Gallagher.

Coldstream's conversion reduces the aircraft's empty weight by 3,500 pounds (1,590 kilograms), while adding several key pieces of equipment, including an Airbus hoist, specialized sponsons, dual bubble windows, the NVG compatibility, and a 4,200-liter belly tank.

Gallagher said Coldstream wouldn't be operational with the NVG capability until next summer, while the tank is still in development with a partner, and is hoped to be ready for launch by the fall.

Until then, the aircraft will use a 4,000-liter (1,050-US gallon) Bambi Max 4000 bucket for firefighting operations. It has already worked on one fire — the Richter Mountain fire in British Columbia - during which it dropped 660,000 liters of water onto the fire on the first day of operations.

"It's already an extremely effective tool for fire operations," said Gallagher. "The amazing thing with this aircraft is its fuel range. We're able to be over the top of a fire for three hours at a time, whereas most other aircraft, including heavies, are an hour to an hour and a half. So for a fire attack capability, the aircraft offers great overwatch."

The aircraft has also completed its first hoist rescue (saving several climbers who had become stuck), recovered a crashed helicopter, has been used to dry cherries on a farm, and completed several construction jobs, including working on ski lifts. All this within its first few weeks in operation.

Gallagher said the feedback from customers has been good so far, and believes there is sufficient demand for the capabilities of the Super Puma/Firecat to sustain the use of the aircraft in the long term.

"The capital costs on the aircraft are reasonable, not astronomical - we've had guite positive feedback in terms of pricing," he said. "I think there's a market there and I think certainly from the utility and construction point of view, obviously they're willing to pay that because of that capability of the aircraft. And I think fire agencies are very quickly catching on, and looking at new tools to actually deliver what they need onto these fires, which is people — we can move up to 20 firefighters at a time — and support them with 10,000 pounds of water in the initial attack phase."

To bring the aircraft into its fleet, Coldstream hired two highly-experienced Super Puma pilots, and trained three of its existing pilots on the type. The company made a similar investment on the maintenance side.

So far, the Firecat has proved very maintenance-friendly, said Gallagher, and has been a hit among the company's pilots, too.

"You don't really feel the fatigue after eight hours in the cockpit like you do with other aircraft," he said. "It's almost like being in a jetliner — it's quiet, it's smooth, and you don't get the rattling and shaking like you do in other aircraft. It's very enjoyable to fly."

KOPTER ACCELERATES SH09 FLIGHT TESTING



BY THIERRY DUBOIS

Kopter is preparing to make final aerodynamic design choices for its upcoming SH09, having swiftly gathered test data during flights of the aircraft's third prototype (P3) in Sicily, Italy.

"We have just begun flight-test block 4 – the first one took place in Mollis, Switzerland, from November 2018 to February 2019 and flight-test blocks 2 and 3 here this year in Pozzallo, Italy," said chief technical officer and head of flight operations Michele Riccobono. The first three blocks were dedicated to flight envelope expansion of the light single.

In block 4, "we are starting to refine the aerodynamic configuration of the fuse-lage, empennage and horizontal stabilizer," Riccobono explained. The flight-test block is scheduled to end late this month or early in August. The configuration will be selected by then. "The main goal of these aerodynamic refinements is to optimize the aircraft directional stability and the performance," said Riccobono.

After block 4 is complete, the main gearbox will be replaced. The design is essentially

unchanged. Aeromet, the new supplier, is expected to provide Kopter with a component that will bring back the whole design load envelope. The previous upper housing suffered from quality issues that restricted it.

The conforming gearbox will enable flight-test engineers and pilots to fly the full SH09 design envelope. It will be fully explored in terms of maximum take-off weight (MTOW), longitudinal center of gravity (CG) and maneuvers such as tight turns, said Riccobono. Kopter is aiming for the SH09 to reach an altitude of 16,000 feet and a velocity to never exceed (VNE) of 151 knots at sea level.

The definition of PS4, the first "pre-series" aircraft, will thus be completed by the end of September. Some long-lead items have been ordered already. PS5, which will be identical to PS4, will "follow shortly and be dedicated to the expansion of the envelope to cold climate and hot-and-high altitude airfield operations," said Riccobono. This aircraft is planned to be operated in Alaska and Colorado.

Despite indications last June that the SH09's certification may slip to 2021, the company's target remains to reach this

milestone by the end of 2020. The test site in Pozzallo is meeting expectations and the average of weekly flights — an average of 9.6 — during a flight-test block is twice the initial target.

The European Aviation Safety Agency (EASA) will award the certification. The Federal Aviation Administration (FAA) is expected to validate it soon after, Riccobono said. "To expedite the FAA validation we are going to involve them very early to accommodate, in the certification testing plan, any specific request that may originate from the differences existing between CS27 and FAR27."

Delivery of the first production aircraft, the sixth SH09 to be built, is scheduled for December 2020. The first two customers to receive an SH09 are scheduled to be Air Zermatt and Helitrans, but who will take the first production aircraft has yet to be decided.

Meanwhile, the search for one or two additional shareholders is progressing, according to a Kopter spokesperson. In June, it was hoped to be completed by August, and it is now foreseen in September or October.

ERICKSON ADDS AIRBUS H225 TO ITS FLEET

Erickson Inc. has added the Airbus H225 Super Puma helicopter to its fleet of rotary- and fixed-wing aircraft.

The company announced its first flight with the Super Puma on June 28. Purchased on the used market, it has been configured for Erickson's mission profile, specifically in support of U.S. Department of Defense customers, including the U.S. Navy. Erickson currently has a \$28.4-million contract supplying aircraft to the U.S. Pacific Command area of responsibility.

Erickson said that the H225's advanced glass cockpit avionics, increased payload, and improved range will provide important upgrades to its existing fleet of SA330 J Pumas.

"This aircraft is an investment in our business and a commitment to our customers to bring superb performance to their growing requirements," stated Kevin S. Cochie, VP and general manager, Erickson Defense and National Security, in a press release. "Erickson has a long legacy of serving the Department of Defense and we are ecstatic to add this platform to our complement of rotary-wing

and fixed-wing platforms serving our nation around the globe."

An Erickson spokesperson told *Vertical* that the company "works with our customers to deploy aircraft ideal for their mission requirements" and "will continue to grow our fleet at the requirement of the customers we support."

Erickson's current fleet includes approximately 69 rotary- and fixed-wing aircraft, including 20 heavy-lift S-64 Aircranes. Headquartered in Portland, Oregon, Erickson maintains operations in North America, South America, Europe, the Middle East, Africa, Asia Pacific, and Australia.





DOT INVESTIGATES OPEN-DOOR HELICOPTER OPS

BY ELAN HEAD

The U.S. Department of Transportation's Office of Inspector General (OIG) has launched an investigation into oversight of open-door helicopter flights.

Announced on July 16, the audit will assess the Federal Aviation Administration's (FAA's) processes for review and approval of supplemental restraints for open-door helicopter operations, and its oversight of the use of those restraints.

The audit aims to address a request by New York Senators Chuck Schumer and Kirsten Gillibrand, who asked the OIG to review the FAA's involvement with open-door helicopter tours following a fatal crash in New York City on March 11, 2018. In that accident, five FlyNYON passengers on a doors-off helicopter photo flight drowned when the single-engine Liberty Helicopters Airbus AS350 B2 they were riding in lost power, made an emergency landing to the East River, and overturned in the water.

The pilot managed to escape the submerged aircraft, but the passengers — who were wearing supplemental fall protection harnesses and tethered to the helicopter via locking carabiners at an inaccessible attachment point between their shoulders — were unable to free themselves. Following the accident, the senators asked the OIG to address how the FAA reviewed, tested, and approved the supplemental restraint system that was implicated in the drowning deaths.

As previously reported in *Vertical*, internal FlyNYON emails indicated that FAA inspectors witnessed these harnesses in use approximately five months before the accident, but did not prohibit FlyNYON from providing them to its passengers. In a letter to Senators Schumer and Gillibrand dated Aug. 15, 2018, inspector general Calvin L. Scovel reported that, according to the National Transportation Safety Board (NTSB) — which is leading the ongoing investigation into the crash — the FAA did not evaluate the supplemental restraints used on the aircraft because they were not "required equipment."

Following an urgent safety recommendation from the NTSB, the FAA issued



The OIG's audit stems from a March 2018 accident in which five tightly harnessed passengers drowned after their helicopter made an emergency landing to New York City's East River. **NTSB Photo**

an emergency order on March 22, 2018, applicable to doors-off flight operations for compensation or hire. The order prohibits the use of supplemental passenger restraint systems that cannot be released quickly in an emergency, and the FAA now requires commercial operators to obtain a letter of authorization from the agency before using supplemental restraints.

FlyNYON obtained such a letter of authorization a few months after the fatal crash, and has been conducting doors-off helicopter photo flights ever since. However, Scovel noted in his Aug. 15 letter that "the prevalence of supplemental restraints used in the helicopter air tour industry and the process FAA will use to validate the quick-release capabilities of these restraints remain unclear."

The OIG planned to begin its audit in late July, conducting audit work at the FAA headquarters in Washington, D.C., and select FAA offices which oversee helicopter operations. The OIG told the FAA that it will also interview a small representative sample of companies that use supplemental restraints, and will coordinate with the NTSB, industry associations, and other helicopter tour industry stakeholders.

A FlyNYON representative provided the following statement to *Vertical*: "We

appreciate and stand ready to support smart actions that allow for enhanced helicopter safety and to grow even more jobs in the Greater New York City area. FlyNYON stands ready to work with anyone who wants to pass common sense rules that create more jobs and ensure safety."

In his letter to the senators, Scovel noted that a previous OIG audit had found that the FAA lacked a sufficient number of helicopter inspectors, and had not updated its hiring and training programs to keep pace with critical developments in the industry. He wrote that the FAA had not yet completed the workforce assessment recommended by the OIG, which called for the agency to analyze the location of inspectors, whether those inspectors have the required specialized helicopter experience, and whether inspector workload is adequately balanced between FAA oversight offices.

Following through on that recommendation, he said, would "better position the agency to proactively respond to new developments in the industry." Scovel added that the OIG is "committed to making appropriate recommendations to FAA that will improve its oversight of helicopter safety."

NTSB: PILOT CRASHED AFTER USING CELL PHONE IN FLIGHT

BY ELAN HEAD

The news helicopter pilot who was killed in a crash in New Mexico in 2017 had placed a cell phone call to his car rental company during the accident flight, according to a final report from the National Transportation Safety Board (NTSB).

Bob Martin was the only person on board the KRQE-TV helicopter — identified in the NTSB report as belonging to WQRE, a station that does not appear to exist — when it impacted terrain near Ancho, New Mexico, on Sept. 16, 2017. He was returning to Albuquerque from Roswell, New Mexico, following an assignment in the area.

According to the NTSB report, Martin departed from Roswell in the Bell 206L-3 LongRanger at around 3:54 p.m. local time. Visual meteorological conditions prevailed, with a partly cloudy sky, good visibility, and light winds. (The NTSB report incorrectly refers to an "altimeter"

setting" at the Roswell airport of 26.30 inches of mercury; while this was the barometric pressure, the altimeter setting was around 29.94, according to historical data from Weather Underground.)

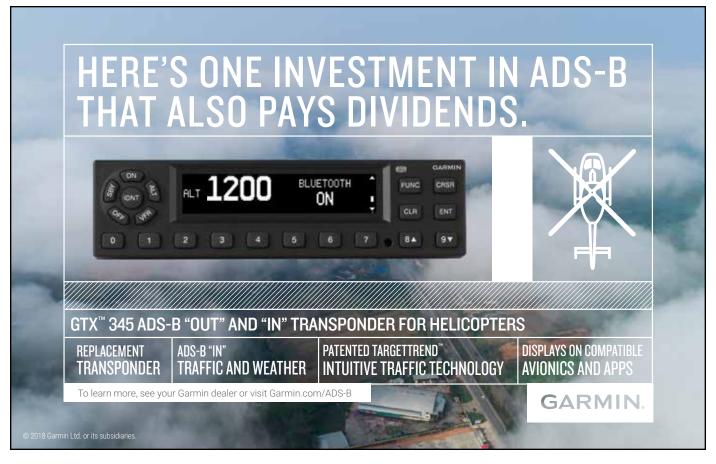
A review of cell phone records indicated that Martin placed a three-second phone call to a car rental agency at 4:07 p.m. Five minutes later, he repeated the call, and spoke with an employee there for one minute and 47 seconds before the call was disconnected. The employee later told investigators that Martin sounded "busy or distracted," and that there was a strange "skipping" or "radio noise" before the call dropped as they were ending the conversation.

According to the NTSB report, the accident occurred at around 4:35 p.m., based on the last recorded GPS data. That data showed that for about the last five minutes of the flight track, the helicopter's GPS altitude varied between 6,200 and 6,456 feet above sea level, while the surrounding terrain ranged in elevation

from 6,000 to 6,400 feet. The helicopter impacted the ground at an elevation of 6,330 feet.

The wreckage was discovered after a person near the accident site saw smoke and drove over to investigate. The NTSB determined that ground scars and signatures were consistent with a slight, noselow impact with terrain. "Although the airframe and engine examinations were limited by impact and fire damage, they did not reveal evidence of any pre-impact mechanical malfunctions or failures that would have precluded normal operation," the report states.

Despite the fact that, according to the report's timeframe, approximately 20 minutes passed between the time of Martin's phone call and the collision, the NTSB concluded that, "based on the available information, the pilot was likely using his cell phone during the low-altitude flight and became distracted, which resulted in controlled flight into terrain."



AIRBUS SEES ELECTRIC BACKUP SYSTEM AS SILVER BULLET

BY THIERRY DUBOIS

Airbus Helicopters is studying an electric backup system (EBS) that it claims could bring benefits in safety, payload and noise footprint for single-engine helicopters.

The manufacturer is planning on demonstrating the use of the EBS, which it describes as a "hybrid propulsion system," on an H130 light single in 2020.

The EBS would be based on a 100 kW motor and 1 kWh lithium-ion batteries. Under a parallel hybrid architecture, the motor will be connected to the main gearbox. The EBS will thus be able to power the rotor for about 30 seconds.

The main improvement from an EBS, as shown in flight on a modified AS350 AStar in 2011, would be seen in case of an engine failure.

The system would not be powerful enough to act as a second engine, but it would make autorotation safer by keeping the rotor's rotation speed constant, Airbus said. The pilot would have more time to react, and would not have to push the collective stick within the first critical couple of seconds following an engine failure.

The EBS would then provide some power

at flare, making that final landing phase easier.

A technical demonstration eight years ago was successful. However, due to the weight of the system, which was cutting the payload by an unspecified but significant proportion, no business case could be found to bring it to market.

The key in the current project is the swift progress electric devices have made. This is the case for the motors Thales will supply, at 2.3 kW/pound (5 kW/kilogram), noted Tomasz Krysinski, vice president of research and innovation at Airbus.

The batteries Airbus Defence & Space will provide will have better energy density, by a factor of two, than the ones used in 2011. As a result, the system is expected to weigh 165 lb. (75 kg), said Krysinski.

But the second source of power will be harnessed to increase the certified payload. Thanks to the electric 100 kW, the same flight envelope (defined in altitude and speed) can be used with a greater maximum take-off weight. In case of engine failure, the EBS will help keep the helicopter in the certified flight envelope.

Its power will enable the aircraft to carry 330 lb. (150 kg) on top of the existing

maximum take-off weight, said Krysinski. This will translate into a 165 lb. payload improvement (as the system itself weighs 165 lb.).

The third benefit of the EBS is in making a helicopter a better neighbor, according to Krysinski.

Blade tip speed creates the most annoying contribution to the rotorcraft's external noise. With the EBS, one could imagine slowing down the rotor to reduce that noise when only part of the rotor's maximum lift is needed. This is not usually done because, in case of an emergency situation, the pilot would need to accelerate back to the rotor's nominal speed very quickly. This would be incompatible with the inertia of a turbine engine.

On the contrary, the responsiveness of an electric motor will allow reduced rotor speed operations in an urban environment, Krysinski said.

The EBS is now at technology readiness level (TRL) 4, which means it is a research project. The project is being jointly funded by Airbus Helicopters and the French civil aviation authorities (DGAC). Airbus intends, after two to three months of flight testing next year, to reach TRL 6 – the required level to launch the development of a product.

MATT ZUCCARO TO RETIRE FROM HAI

Matt Zuccaro has announced he will retire from his position as president and CEO of Helicopter Association International (HAI) next year, after almost 15 years as the association's leader. HAI said it will use an executive search firm to help find his successor, who will begin on July 1, 2020.

Zuccaro, whose career in aviation has spanned more than 50 years, was appointed to the role on Nov. 1, 2005.

"The HAI board of directors, on behalf of the entire industry, offer our deepest appreciation to Matt for his service," said outgoing HAI chair James Wisecup. "Through his leadership, HAI has been a leading advocate to improve the safety of helicopter operations worldwide. Matt has also been a forceful supporter for the industry in legislative and regulatory matters, saving our members and the industry

at large from overburdensome legislation and regulations."

Incoming chair Jan Becker said the next HAI president faced several major challenges in an industry evolving at a record pace.

"[They] must be capable of navigating through several complex issues, including the pilot and maintenance technician shortage and the safe integration of unmanned aerial systems, while continuing to provide members with tools that enhance the economic viability, safety, and public acceptance of their operations," said Becker.

Zuccaro received his initial helicopter flight training as a U.S. Army aviator and served with the 7/17 Air Cavalry unit in Vietnam. He holds an airline transport pilot and certified flight instructor — instrument certificates for both airplanes and helicopters.



He is a recipient of the HAI Pilot Safety Award for 10,000 hours of accident- and violation-free flight hours, the NBAA Pilot Safety award, and numerous other industry awards for his efforts and commitment to the helicopter industry.

Zuccaro indicated he is looking forward to the opportunity to spend more time with his family as he considers new opportunities to assist the international helicopter community.

KAMAN OPENS NEW HELICOPTER CUSTOMER SERVICE CENTER

On July 17, Kaman Aerospace opened a new customer service center to support both its K-Max and SH-2 Super Seasprite customers and inaugurated a K-Max Flight Training Device (FTD). The new facility is located on Kaman's Bloomfield, Connecticut, campus and replaces and consolidates legacy Kaman customer service accommodations.

The K-Max Level 5 FTD is fully operational and ready for pilot transition training, the company said. It will be incorporated into the K-Max initial and recurrent flight training syllabus. The FTD, which is housed in the customer service center, was designed, manufactured and installed by Entrol of Spain.

The customer service center also houses the K-Max customer service team, Kaman pilot offices, training space and office space for customers while they are on site.

"Given our increased levels of pilot training, the simulator will be an effective tool to cost effectively enrich the pilot training experience," said Darlene Smith, vice



president and general manager of Kaman's Air Vehicles division, "In addition, we are very proud of the new customer service center, which brings together under one roof a number of customer support functions. We look forward to providing a higher level of service and support for customers of both of our aircraft platforms."

Development of the K-Max aircraft was led by Kaman's founder and former CEO (and

aviation pioneer) Charlie H. Kaman, and received Federal Aviation Administration certification in 1994. The K-Max is a rugged low-maintenance aircraft that features a counter-rotating rotor system and is optimized for cyclical, external load operations. The aircraft can lift up to 6,000 pounds (2,722 kilograms). The SH-2 Super Seasprite is a naval maritime aircraft with an existing fleet in service with nations around the world.



NEW HUMS TARGETS LIGHT HELICOPTER MARKET

BY OLIVER JOHNSON

A new health and usage monitoring system (HUMS) is aiming to democratize predictive and preventative maintenance, bringing the technology to the world of light helicopters.

The system, known as Foresight, is the brainchild of Eric Bechhoefer, a former Navy pilot with more than 20 years of experience in avionics, who developed the product through his company, Green Power Monitoring Systems (GPMS).

The system has five key features: engine performance monitoring, mechanical system monitoring, flight regime recognition, flight data monitoring, and rotor track and balance. And not only does Foresight provide health and usage monitoring, it calculates the remaining useful life on key components to help maintenance engineers keep ahead of any potential issues.

"We've essentially got an opportunity to have maintainers moved from a world where they're using traditional forms of maintenance to one where they're leveraging the benefits of predictive analytics," Andrew Swayze, head of marketing at GPMS, told *Vertical*.

The cloud-based system includes both hardware and software components, with an intuitive user interface.

Foresight was piloted in Duke Energy's Bell 407s last year. Following the completion of the pilot, the company decided to outfit its entire fleet with the system, contracting GPMS to adapt the system for the Bell 429, too. GPMS is also working on supplemental type certificates for the product "for a number of other platforms," said Bechhoefer.

"The 407 is a great platform to start with," he said. "We actually started with a 206, but there's a lot of 407s out there and so that's a very attractive market."

Airbus AS350/H125 AStars are similarly attractive, and GPMS plans to soon have an STC for that type.

The company believes that 70 percent of light helicopters lack any kind of HUMS, representing an enormous potential market

"We'd compete well against the medium or heavy [HUMS] applications that are already out there, but there's really no solution for the light helicopter market," said Bechhoefer. "And if anyone needs these things, it's those guys, because they're much more on a budget, I think, than the larger operators or heavy fleet operators."

One of the key finds of the system during the pilot was the detection of a potential issue with a duplex bearing. And when Duke Energy looked in the gearbox

during a routine 2,500-hour inspection, they found one of the bearings was indeed heavily scuffed.

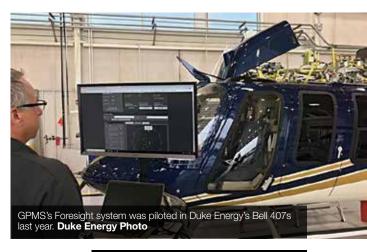
"So the system worked as designed and they were able to do opportunistic maintenance and basically get rid of an unscheduled maintenance event, which would have been expensive," said Bechhoefer.

Another event saw a pilot complaining about a loss of engine power while working remotely. Instead of having to jump on a plane and travel to the helicopter, Duke's maintenance team was able to look at the analytics screen and confirm that, due to bleed air bleed being on, the reduced power was a normal condition.

According to GPMS, the Foresight system overcomes the most common complaints about HUMS systems: that they're too expensive, heavy, have a high false alarm rate, or don't detect events successfully enough.

Foresight weighs just 8.8 pounds (four kilograms), and according to GPMS, is about half the cost of a comparable medium helicopter HUMS kit — ranging from \$50,000 to \$80,000 up front, depending on the complexity of the components being monitored. On top of this is a subscription fee, but Bechhoefer said the system quickly proves its worth.

"If you're probably flying more than 200/300 hours a year, this is going to pay for itself in under two years," he said. "We're providing more operational readiness, the ability to get rid of unscheduled flights. And so we're also reducing risk."



RotorBits

NEW H145 STARTS HIGH

ALTITUDE CAMPAIGN IN CHILE

The prototype of the five-bladed H145, which Airbus Helicopters unveiled at Heli-Expo in Atlanta, Georgia, in March, arrived in Chile at the end of June to begin a high altitude flight campaign. Airbus expects European Union Aviation Safety Agency (EASA) certification of the aircraft in early 2020, with deliveries following later that year.

The Chilean Andes reach beyond 20,000 feet (6,100 meters), and the H145 arrives there having already performed some altitude tests in the French Pyrenees during the summer of 2018. The objective of the new campaign is to expand the flight envelope of the new helicopter and demonstrate its capabilities at high altitudes.

The flight campaign will also provide some operators in the region with the opportunity to fly the new version.

The five-bladed H145 promises an increased useful load of 330 pounds (150 kilograms), with a maximum takeoff weight raised to 8,378 lb. (3,800 kg).

Airbus said the simplicity of the new bearingless main rotor design will also ease maintenance operations, while improving ride comfort for both passengers and crew. The reduced rotor diameter will allow the H145 to operate in more confined areas.

BENDIXKING AND AIRWORK TO CERTIFY COCKPIT UPGRADES

BendixKing and Airwork New Zealand are collaborating to develop supplemental type certificates (STCs) for cockpit upgrades of light and medium-size general aviation helicopters. BendixKing's AeroVue Touch Integrated Flight Deck is qualified to be installed on Part 27 light helicopters.

"This new collaboration will allow us to upgrade analog cockpit systems with new technology that will greatly improve safety and help reduce accidents," said Shane McMahon, general manager, Airwork. "With BendixKing's technology, we will be able to target this section of the helicopter market and provide a significant improvement in situational awareness that will provide a reduction in pilot workload while enhancing operational safety during demanding phases of flight."

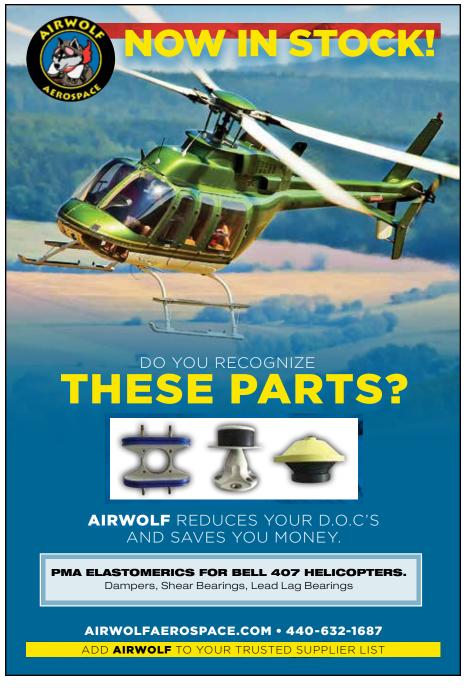
The STC for this suite will be developed by Airwork, initially for the Airbus AS350, with support from BendixKing's engineering team. The solution, which draws on Honeywell's expertise in commercial and military aircraft programs as well as existing Primus Epic and Apex flight decks, will allow operators of utility helicopters to replace their older analog gauges with advanced technology displays.

Following successful installation on the first aircraft, other similar aircraft types will be added to the STC, the companies said.

In addition to new functionality from Honeywell's SmartView synthetic vision system and ADS-B In for weather and traffic, BendixKing said its cockpit technology package will provide helicopter operators with near-real-time flight data information with minimal downtime for installation, and will reduce ongoing operational and maintenance costs.

"We're bringing the quality and sophistication of BendixKing's avionics systems to the Airbus AS350 aircraft," said Freddie Zonoozi, vice president, International Sales, BendixKing. "These technologies provide a significant improvement in reliability by replacing analog instrumentation with a modern solid-state solution. The reduction in weight, parts and aircraft wiring also allows for a lighter aircraft, requiring less fuel and providing improved savings."





ERA LOGS 200,000 FLIGHT HOURS WITH AW139 FLEET

Era has reached an operating landmark with its AW139 fleet, recently passing 200,000 flight hours in the type. Era operates 36 AW139s, primarily for offshore oil-and-gas transport, while also providing emergency response services, firefighting, utility, and VIP transport.

Era's AW139s are flown under continuous advanced HUMS monitoring as a standard technology support capability to ensure enhanced reliability, safety and cost effective maintenance.

In addition to the AW139s, Era's fleet includes the AW189, AW119 and AW109 Power helicopters. Era is also the U.S. launch customer for Leonardo's AW609 tiltrotor, the world's first multirole commercial tiltrotor. Leonardo expects to make the first AW609 delivery to Era next year.



EASA certifies Astronautics RoadRunner EFI



Astronautics Corporation of America's AFI4700 RoadRunner electronic flight instrument (EFI) has received a supplemental type certificate (STC) from the European Aviation Safety Agency (EASA) for Leonardo A109/119 helicopters.

Astronautics said its newest EFI is an easy-to-install and cost-effective replacement providing operators the fastest way to upgrade from existing attitude director and horizontal situational indicator functionality — whether a first-generation EFIS or electromechanical gauges — to a modern EFIS, enabling enhanced capability and safety features.

The RoadRunner EFI received a Federal Aviation Administration STC for A109/119 helicopters on June 12. An STC from the National Civil Aviation Agency of Brazil (Agência Nacional de Aviação Civil) for these platforms is expected shortly.

RotorBits

BECKER RELEASES

NEW-GENERATION DIGITAL

INTERCOM SYSTEM

Following the introduction of the DVCS6100 digital intercom system in 2008, Becker Avionics is now also offering the innovative AMU6500.

This new-generation digital intercom system incorporates several advanced features such as 3D audio technology and Bluetooth compatibility. 3D audio allows for customizable left or right channel separation into crew helmet or headsets.

Selectable channel separation of left or right audio radio frequencies for complex missions with multiple radio frequency operations is also available. Enhanced safety and efficiency by reducing crew workload along with improving situational awareness were primary design considerations of the AMU6500, the company said.

The AMU6500 digital intercom also provides for Bluetooth pairing of cell phones, MP3 players, or tactical headsets that have this capability. The new system can control up to 12 separate radios.

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SEI DEMOS BAMBI MAX IN SOUTH AMERICA



SEI Industries and Eagle Copters South America recently hosted a Bambi MAX aerial firefighting system information session, which was followed by a demonstration using a Bell 407 supplied by AeroMAX. The simulations included filling the Bambi MAX with water from a collapsible and self-supporting FireFlex Pumpkin Tank, also manufactured by SEI Industries.

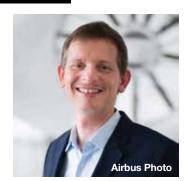
"The Bambi MAX features a lightweight, low power draw, efficient multiple-drop valve that maximizes the bucket load throughout the fuel cycle," said Sergio Fukamati, director of SEI's aerial firefighting division. "The standard Bambi Bucket has evolved over the years and now the Bambi MAX is the most advanced bucket system available for the fight against wildfires."

ROMAIN TRAPP APPOINTED PRESIDENT

OF AIRBUS HELICOPTERS, INC.

Romain Trapp has been appointed president of Airbus Helicopters Inc. (AHI), and head of the North America region for helicopters. He replaces Chris Emerson, who is assuming the role of president of Airbus Defense and Space, Inc.

Trapp has broad experience within Airbus, having worked for the company for nearly two decades, including 11 years in North America. He first served as CFO of AHI, based in Grand Prairie, Texas, beginning in 2008. He became AHI's chief operating officer in 2016, and has also been president of Airbus Helicopters Canada since 2013.



"Romain brings a keen understanding of the North American helicopter market, and I could not think of anyone better suited to take on this role than someone who has led such a diverse range of our U.S. and Canadian activities for so long," said Bruno Even, CEO of Airbus Helicopters. "I am confident he will continue to support our customers and grow our business in the world's largest in-service helicopter market."

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

RotorBits

DART'S AMSTERDAM FACILITY

NOW FULLY FUNCTIONAL

DART Aerospace is expanding its Europe, Middle East and Africa operations with the opening of an Amsterdam repair and overhaul facility, which is now fully functional. DART's roster of clients across Europe, the Middle East and Africa can now send their inflatables directly to the Amsterdam facility for repair and overhaul, significantly reducing the time it previously took to ship these systems to DART's original repair and overhaul facility in Broussard, Louisiana.

DART's latest R&O facility, situated outside of Amsterdam in Nieuw-Vennep, is newly part 145 certified by EASA, effectively providing it with the authorization to perform maintenance on inflatable equipment within Europe.

WORLD HELICOPTER DAY

CONTINUES TO GROW

On Aug. 18, 2019, the global helicopter industry will celebrate one of the world's greatest engineering inventions with rolling events currently spanning 15 different event locations in eight different time zones.

World Helicopter Day aims to raise awareness of the helicopter's contributions to society and celebrate the diversity of people who design, fly and support them.

Every day, thousands of people rely on helicopters for rescue, disaster relief, transport, firefighting, medical transfers, power line maintenance, tourism, agriculture and many other roles. However, few people get to see helicopters up close or have the opportunity to talk to the people who work with them. Planned events will give local communities the opportunity to inspect several different helicopters, discover more about how helicopters fly and learn about careers in the helicopter industry.

More details on individual event locations are available on the World Helicopter Day website: worldhelicopterday.com.



2019 Vertical PHOTOCONTEST

The Vertical Photo Contest is back! Over the years, we've awarded thousands of dollars in prizes to talented photographers from around the world—and you don't have to be a professional aviation photographer to compete. In fact, some of our best photos have come from people who simply happened to be in the right place at the right time.

So what are you waiting for? Submit your best work in these three categories:

1 HELICOPTERS AT WORK

MILITARY

3 BEAUTY SHOTS IN THE FIELD

GRAND PRIZE

\$1,000 CASH AWARD

• featured on the cover of the Dec.'19/Jan.'20 issue of *Vertical* (1 Winner)

FIRST // \$750 cash award (3 Winners, 1 in each of the 3 categories)

SECOND // \$500 cash award (3 Winners, 1 in each of the 3 categories)

THIRD // \$250 cash award
(3 Winners, 1 in each of the 3 categories)

All winning photos will be featured on our social media channels and in the Dec.'19/Jan.'20 print issue of Vertical Magazine.

CONTEST OPENS Aug. 16, 2019 CONTEST GLOSES at 11:59 pm, Sept. 27, 2019

For official rules, prize information, and entry form, visit

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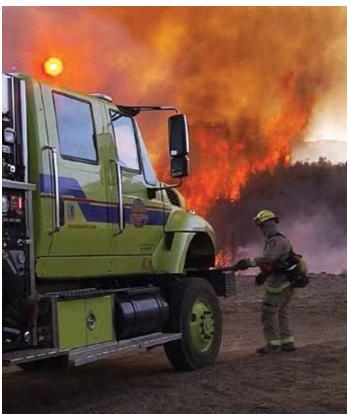


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interviewed by Oliver Johnson



DARLENE SMITH

DARLENE SMITH HAS SPENT ALMOST 40 YEARS WORKING IN THE AEROSPACE INDUSTRY; FIRST AT PRATT & WHITNEY, AND NOW AT KAMAN AEROSPACE. SHE WAS RECENTLY APPOINTED VICE PRESIDENT AND GENERAL MANAGER FOR KAMAN AIR VEHICLES & MRO.

VERTICAL: What brought you to aviation?

DARLENE SMITH: I actually started at Pratt & Whitney in 1980. I was right out of school and signed on with an entry level job and just worked my way up through the organization. I spent 21 years there, and had 14 different positions. I left as a general manager.

Pratt & Whitney's pretty progressive in change management and lean. My specialty really is solving problems — improving a business's results — and creating organizational alignment. That's one of the reasons why I ended up where I am now.

V: Having held those various positions at Pratt & Whitney, and now at Kaman — is there something appealing to you about moving into slightly different or new sectors?

D.S.: There is. I enjoy learning a new process or a new product, but I think the biggest challenge when starting something

new is usually the organization's culture. You have to be able to work through conflicts while making the necessary changes to improve the business and the performance.

V: What was your first impression of Kaman when you arrived?

D.S.: Charlie Kaman [the company's founder] had left just prior to me starting, so it still had the culture of a family-owned business. The culture was extremely strong and was centered around Charlie's presence. It was hard to make changes without Charlie at Kaman, because people were used to following his lead. That said, Kaman's gone through many changes since then.

V: What does your role entail now?

D.S.: I run the helicopter division at Kaman. So that's the SH-2 and K-Max. We had been out of production on K-Max for so long, there really was no investment in this product. The strategy we put together last year — and we're doing it again this year — is investing in what we need to grow. There's a commitment to rebuild the OEM side of the business. The resources are sparse, because for two decades people have been retiring or taking different positions. It's been a challenge.

A year ago, 80 percent of my staff were not in their current role, so I had to rebuild the management team. I'm also happy to say that my leadership team is very diverse.

V: What's your impression of the issue of gender in the aerospace industry? What is it that keeps more women from joining?

D.S.: I don't believe it's really more difficult, but you need the right personality. You have to be fearless. You're competing with 95 percent male colleagues at my level. I actually never felt a difference between male and female. I never really thought about it. Lately I've been thinking about it more because I'm noticing that women actually need some help. They're smart and they're good, and if they just were a little more aggressive and they had some mentoring, they can easily get these jobs.

The other thing I'm realizing is that they don't promote themselves the way that men do. A very good example is if you're looking for someone to work on an ERP [enterprise resource planning] system, a guy that worked at a company that put an ERP system in will put that on his resume. A woman would have

to run that team to put it on their resume. I know how to interview people to get down to that level, therefore allowing me to hire women as easily as I hire men.

In 2013 I started a "Luncheon with the Ladies" event at Kaman, because it was becoming more and more obvious that we could get more diversity if we tried. We held those sessions for a couple of years, did a lot of training, and then the corporation got involved and we started a corporate-wide initiative called WALK, which is Women Advocating Leadership at Kaman. At the last WALK event, there were about 80 females from around the company. WALK is working. It's starting to filter in. And it's not just about females, quite honestly, it's any diversity.

V: Switching focus to your product line, how has the support organization had to evolve with the second lot of production K-Max aircraft getting out there and flying? How many K-Max are actually out there?

D.S.: There are now 33 aircraft with 16 operators in five countries. And we're not thinking in terms of lots anymore — we're just in continuous production.

When I first got here we did a SWOT analysis to determine our strengths, weaknesses, opportunities and threats. One of the things that came right up to the top was that we needed to improve our customer service. The relationship, the inventory, spare parts — just the customer experience needed to improve. And we've done a lot to improve this area. We've brought in new people. We've upgraded our software. We had the grand opening of our customer service center in July, which is in a building here in Bloomfield that has been outfitted for pilot and mechanic training. We bought a level five flight training device for the K-Max, and it is also housed in that building. So we're doing a tremendous amount to show our customers that we're back in the game, we're here to stay, and it's an open door. We're talking to customers every day.

V: What's the feedback you're getting from operators that are perhaps new to the type?

D.S.: They love the aircraft. The aircraft is built for what it does: it lifts. It's a heavy lifter, great for hot and high environments. It's perfect for firefighting. They're already

contracted for the fires. In fact, we're going to be sending some spare parts to the West Coast in case they need parts right away.

There are some things about the K-Max that customers would like to see changed and we're working to address these. The blades are composite but have a wooden spar, and one of our biggest investments in the platform is the development of a new composite spar. We expect this will improve performance, lower maintenance costs, and extend blade life.

The interesting thing is, of the first 10 aircraft we sold since we opened the line back up, 40 percent of the sales went to existing K-Max operators. In addition to the typical uses in firefighting and logging, they're branching out into quite a few new markets. They're working on everything from power lines, goldmines, military work, and infrastructure work — such as rebuilding in Puerto Rico. So, more and more uses are coming up for this aircraft.

Our concentration has not just been on operators, we're focusing on who needs the solution to the problem — the end user: the firefighter, the logger, or the utility or oil-andgas company. Those are the companies we've been trying to meet with to figure out how to bring more business to our helicopters through our operators.

V: You're also working with the Marines on bringing two unmanned K-Max back into service, aren't you?

D.S.: Yes. The aircraft were being stored in Yuma and the Marines brought them back here to Connecticut. They're flight ready, but we're waiting for a certificate to fly. Swanson Group Aviation helped us with this work. The Marines are building new strategies for the next 15 years on how their logistics will work and we want to be a part of that.

We have also developed our own unmanned system to go into the K-Max, and that should be ready next year.

V: Is that a kit? Will you be able to retrofit it into existing airframes?

D.S.: That's the plan. Two of our operators have signed MoUs [memorandums of understanding] to get the first kits onto their aircraft. The target is fire. Now, it may not be the fire itself — it could be resupplying firefighters in difficult areas, or it could be actually dumping water at night unmanned or in heavy smoke. So they're very interested. The Alaskan government is also interested because they have a very rural environment and they need to get supplies

to remote areas. Teaming with these two operators, we will begin to solve these types of challenges and it will also help launch the Unmanned K-Max again.

V: Is it essentially the same technology as in the unmanned aircraft you had over in Afghanistan?

D.S.: The system we are developing is new but it has similarities to what was developed for the Afghanistan mission. That original technology was developed in partnership with Lockheed Martin. We're teaming with a new partner who has a more modern and cost-effective system for commercial application. The technology exists and is being adapted to the K-Max.

V: How would the operators be controlling the aircraft?

D.S.: From a ground station.

V: And is it a matter of just putting in waypoints?

D.S.: Yes. Down the road, there are a lot of other things that will be required by the end user — whether it's the Forest Service or the

Marines. We're just starting with the basic ability to fly unmanned.

V: What would you say is the major challenge that you're facing in the near term?

D.S.: I think we're still uncovering all our end markets. And right now, we're working with five different countries to certify the K-Max. The K-Max would be a good fit for humanitarian operations. We aren't working in Africa yet, but obviously that's a possibility. We're trying to broaden our reach. That's number one.

Number two: the unmanned market at some point is going to take off. Whether it be unmanned taxis or unmanned aircraft carrying cargo. That's going to be an interesting road, because there is no FAA [Federal Aviation Administration] certification path for an unmanned aircraft of this size. That doesn't mean there won't be, but we may have to be restricted or experimental. So we have to walk down that path with the FAA and work closely with our end customers and the governing bodies to make this happen.

This interview has been edited and condensed.





TANDEM

POWERED

INDUSTRY HEAVYWEIGHT AND TANDEM-LIFT
SPECIALIST COLUMBIA HELICOPTERS IS POISED

FOR GROWTH UNDER NEW OWNERSHIP.

STORY BY OLIVER JOHNSON // PHOTOS BY SKIP ROBINSON

In the small town of Aurora, Oregon, change is in the air. For more than 60 years, it has been home to one of the helicopter industry's most enduring heavyweights — the heavy-lift specialist Columbia Helicopters. Founded in 1957 by industry pioneer Wes Lematta, Columbia has seen global success with its instantly-recognizable fleet of tandem-rotor aircraft. Throughout that time, ownership of the company remained in the hands of the Lematta family. But on July 18, 2019, the company announced the start of a new phase in its storied history, with AE Industrial Partners agreeing terms with Columbia to acquire the company.

While the change in ownership may be the most dramatic shift at the company, it's just one of a range of recent evolutions taking place at Columbia, as it strengthens its market position and adapts to take advantage of new opportunities in the increasingly-packed heavy-lift sector.

Today, Columbia has a staff of over 800, and a giant tandem-rotor fleet that includes 11 Model 234 UT/LR Chinooks (capable of lifting 28,000 pounds/12,700 kilograms on the hook), 14 Model 107-II Vertols (11,500 lb./5,220 kg on the hook), and three Boeing CH-47D Chinooks (26,000 lb./11,800 kg on the hook). Its operations take it across the United States, Canada, Papua New Guinea, and Afghanistan.

For the last two years, the company has been led by Steve Bandy, who joined Columbia in 1989 as a co-pilot. He has worked in a series of increasingly senior leadership roles at the company over the years, ultimately being promoted to president in June 2017.

"I was always given the opportunity to grow my capabilities and advance within the organization, which is a really great thing with this company — the trust it puts in its people," said Bandy. "My story is not uncommon. Columbia truly provides tremendous opportunity for people who are interested in achieving excellence and mastering whatever challenge is put in front of them."

In return, Columbia enjoys long tenure and loyalty from

its employees, with Bandy highlighting that several people have been at the company for more than 40 years.

"Our tagline is: "dedicated people, inspired solutions," said Bandy. "We don't underestimate how dedicated our employees are, and the inspiring things they do every day are pretty impressive."

While Columbia has always done some firefighting, logging work provided the bulk of its revenue as recently as the early 2000s. But today, the company does very little logging, and with 12 aircraft supporting military operations in Afghanistan, government and military support contracts have become a crucial part of its business.

This government charter work is one of the core segments for the company's aviation services division, along with onshore oil-and-gas support, construction, forestry and stream restoration, and firefighting. Despite a general industry downturn in the oil-and-gas market, Columbia has maintained a strong presence in Southeast Asia (primarily Papua New Guinea) working in the sector.

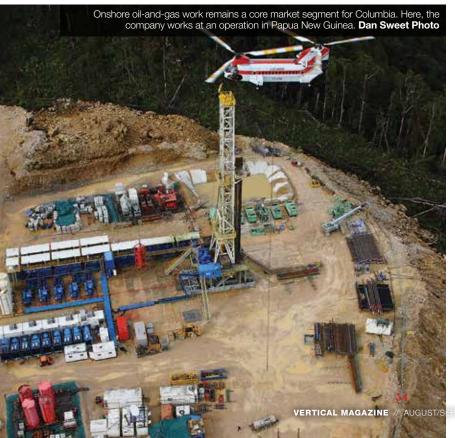
And in its firefighting operations, the longer and more severe fire seasons of the last few years have provided some stable work with the U.S. Forest Service, and Columbia is also exploring new opportunities to fight fires outside the U.S.

Of course, Columbia isn't just an operator — it also functions as a maintenance, repair and overhaul (MRO) provider and, following its acquisition of the 107 and 234 type certificates from Boeing in 2006, an original equipment manufacturer (OEM).

According to Santiago Crespo, vice president of business development and marketing, it's this vertical integration that allows the company to maintain an extraordinarily high fleet availability percentage that's in the "mid 90s." He said this was one of the things that set Columbia apart from its competition — alongside its use of the 234.

"We differentiate ourselves because we have the standard transport category 234, and we're still the only







Columbia now has a fleet of 28 aircraft in operation, spanning the Model 107-II, Model 234, and CH-47D.

Longer and more severe fire seasons have provided some stable firefighting work with the U.S. Forest Service.



company that operates the standard transport category Chinook," said Santiago Crespo. "That has some significant benefits, especially when you're operating in international markets or operating for certain customers. The 47D is a great platform, but still it's a restricted category aircraft — you can't transport passengers."

UNDER NEW OWNERSHIP

The recent announcement of the change in ownership at Columbia followed a high profile acquisition attempt from fellow industry juggernaut Bristow Helicopters. Announcing the \$560 million move in November 2018, then-Bristow CEO Jonathan Baliff labelled it "the largest transaction in [Bristow's] history."

However, Bristow was facing considerable financial and operational headwinds at the time, and was unable to close the deal by the scheduled completion date of Dec. 31. By February, the two companies announced they had terminated the process — at a cost to Bristow of \$20 million.

"It was a very public process, so obviously people knew we were in play at that point and we had a lot of people reach out [about purchasing Columbia]," said Bandy. Columbia's management team narrowed down the list of potential suitors, and ultimately agreed a sale to AE Industrial Partners — a private equity firm specializing in aerospace, defense and government services, power generation, and specialty industrial markets.

"They have a keen understanding of the industry, with lots of resources and knowledge that will benefit the company," said Bandy. "What it does, is it takes us from an organization that's been very comfortable in its size and space and moves us into a more dynamic position. I think we have been positioned to be able to grow and we are a great platform to grow in the industry — we have just been waiting for that opportunity. And I think that is what AEI unlocks for us."

That expansion may be in fleet size, as well as market scope. "We have essentially had the same sized fleet — other than the addition of the 47Ds a few years ago — for several decades," said Bandy.

Any fleet expansion would likely be through the addition of further tandem-rotor aircraft, he added. "As the type certificate holder and the production certificate holder of the 107 and the 234, we have complete control over our supply and our configuration of aircraft components," said Bandy. "So, I think that would be our primary focus."

In 2012, Columbia bought a fleet of 10 Vertol 107s (retired HKP-4s) from the Swedish military and have started the process of making them operational. The three former U.S. military CH-47Ds already flying in the Columbia fleet are from a batch of 11 it purchased between 2014 and 2015. More recently, its 234 ranks swelled with the arrival of three of the type from Taiwan in 2016 (these were the last three 234s available on the market, so the purchase made Columbia the only operator of the type in the world).

The market for heavy-lift work is buoyant, said Bandy. "There is more demand than we have resources," he added. "Our DoD [Department of Defense] operations have absorbed every resource we have been able to offer. We see strong demand in the emergency response type of markets and again our biggest challenge has been providing enough resources to meet the demand."

And this is despite the recent flood of aircraft capable of medium-to heavy-lift operations into the utility market, through the civilian debut of former U.S. military Sikorsky UH-60 Black Hawks and sale of further military CH-47Ds, and the repurposing of much of the offshore Airbus H225 Super Puma fleet into utility operations.

In terms of the former, Bandy said Columbia has a significant advantage with its fleet being composed of transport category —









rather than restricted category - aircraft.

And while Bandy said Columbia "would have explored options" with the Super Puma if the Bristow acquisition had completed, it's not a type of aircraft the company is currently looking to acquire.

"We operate at such a high tempo that the support structure behind the aircraft is really critical for us," he said. "First generation OEMs sometimes lose interest in legacy products that they are no longer able to sell as a new product, and so we will just have to see how that [Super Puma] support structure holds up."

AN MRO SPECIALIST

Kurt Koehnke, vice president of maintenance, is the longest-tenured vice president at the company, having been at Columbia for 32 years. He said MRO growth has been one of major areas of change at the company over the years. All told, the MRO team now totals 275 technicians.

Typically, Columbia's aircraft deploy in the U.S. with a service van and an equipment trailer that stocks a large number of parts. Larger items such as transmissions and engines will either be driven out or flown by Columbia's own Beechcraft King Air, which is equipped with a cargo door.

The general change in operation type over the years has impacted the MRO department as well as the flight crews.

"This transition to what we call charter — which is this government

work in Afghanistan — that's a big change," said Koehnke. "That's 200 hours a month consistently on the airframes there, so it's a big transition in the maintenance. We've got nice facilities in Bagram, in Jalalabad. We've transitioned technical experts from avionics and sheet metal and embedded them in the field crews over there."

Columbia has been in Afghanistan for eight years, during which time it has brought new capabilities to its government customer, such as delivering supplies to remote operating bases with a 200-foot long line to avoid damaging them with the aircraft's downwash when using a shorter line. The company originally went with four 107s, and has grown that presence to nine 107s and three 234s.

A team of 84 people takes care of the MRO requirements of the 12 aircraft in Afghanistan. Each of the 107s requires a team of six mechanics (three on-shift), with the three 234s each staffed by 10 mechanics (five on-shift). They work a shift pattern of 28 days on, then 28 days off.

As the aircraft only fly day visual flight rules, maintenance is performed overnight, and the size of the team allows Columbia to keep up with scheduled maintenance and perform unscheduled work as required — ensuring the availability rate stays extremely high.

The capabilities of the team are extensive, and they are supported by an enormous inventory that includes thousands of line items, from major dynamic parts down to circuit breakers and nuts and bolts. This allows them to perform almost every type of maintenance, from complete skin repairs to major structural repairs.

"If we do a mod or a service bulletin, obviously we do it right there in-country — it's too expensive to send the aircraft home," said Koehnke.

With the CH-47D, Koehnke said the transition to supporting that aircraft has been relatively straightforward due to the similarities to the 234, and the fact that many employees are former military personnel who have worked on the type before.

"We'd already been working on Ds for external customers before they came through, so we really had a jump on tooling and technical experience and so on," he said.

When the aircraft arrived, they were completely stripped and the components were individually checked, repaired/overhauled as necessary, and then put in Columbia's inventory. Parts are then taken from the inventory as the aircraft are rebuilt. With 11 aircraft, the company has a significant supply of spares to keep the flying aircraft serviceable.

In terms of the challenges facing the MRO department, Koehnke said the logistics of maintaining aircraft in remote locations such as Afghanistan and Papua New Guinea — clearing the hurdles of licensing, visas and security clearances — can be significant.

Additionally, he said the company was having to adapt to the ongoing shortage of mechanics in the industry.

"We've started a program where we're actually hiring young individuals as a helper," said Koehnke. "They can't inspect, they can't turn wrenches, but we embed them in the shop and they do parts cleaning, running tools, and everything else to support the mechanics. And then we move them to a mechanic trainee, and we have several steps in there until we can get them a license—and that's really helped."

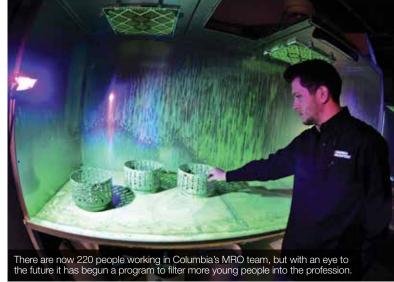
Columbia has even invested the time to go to high schools to plant the seed of a career, and invited classes to tour its facilities.

ENGINEERING AN EVOLUTION

The driver behind much of the ongoing evolution at Columbia is its in-house engineering department. Rob Roedts, director of engineering and production, leads this team of over 60 people, who allow the company to quickly design, develop, and implement any necessary changes to the fleet.









The 234 has been a major beneficiary in this, with Columbia having made over 1,000 changes to the aircraft's original design, from the main rotor blades down to the landing gear.

"We've had to make design changes to make that aircraft work reliably in our environment," said Roedts.

One of the more dramatic was completely gutting and rebuilding the 234's cabin in preparation for part 135 work in Afghanistan, from installing new seats to changing the material in certain types of washers — and everything in between.

The acquisition of the 11 CH-47Ds and conversion for civilian operations has presented a new type of challenge.

"The Army had set up those aircraft to have a huge amount of maintenance, and that phase maintenance program is good for the military because they have hundreds of aircraft, and if they need to down half of them, they can, and still sustain their operation," said Roedts. "We can't do that. So the challenge is, how do you take that aircraft and get it to a level of operating in the 90-percentile availability rate?"

The answer involved solving several other issues, such as figuring out how to build or acquire parts for a restricted category aircraft, and where to find the crews who could work on them.

"A lot of stuff we have done for the 234 couldn't directly transfer over to the 47Ds, for myriad reasons, and so there was a lot of reverse engineering that we had to do," said Roedts. "We had to get it all online to get those aircraft to operate the way we need them to."

The biggest project for the D models was the creation of a 2,800-US gallon internal firefighting tank, with Columbia working with Simplex Aerospace (which owns the STC for the tank) to bring it to the market.

The tank, which Simplex claims is the largest helicopter firefighting system in the world, is comprised of a roll-on/roll-off internal tank system connected to an external plenum through the CH-47D's hook well. It includes a 12-foot-long, 10-inch-diameter hover pump that was designed to refill the tank in less than one minute. The entire load can be dropped in less than four seconds, but the pilot has the capability to select different drop patterns to allow for multiple drops, if needed. The never exceed speed for the tank is 140 knots, while water drops can be made at up to 100 knots.

Two of Columbia's CH-47Ds have the tank installed and are on exclusive use contracts; the third aircraft is on a bucketing contract and uses a 2,600-US gallon SEI Bambi Bucket.











Columbia's engineering team also developed a carbon-fiber bubble door for the aircraft; worked on the subsystems required to allow the CH-47Ds to fly the various operations required by the company (including a utility power control system that allows the pilot to control whatever is on the long line); and installed all-new avionics.

Roedts said the benefit of being both OEM and operator for Columbia's engineers is the short feedback loop. When a design change enters operation, the team is sometimes getting feedback at the aircraft's first stop on the first day.

"It can be challenging at times, but at the end of the day it's huge for us, because we are completely able to respond to the needs of the field, get the design changes incorporated, and continuously evolve the product," he said.

Future evolutions to the Columbia fleet could touch on increasing pilot's situational awareness or automation, and finding ways to reduce the time it takes to reconfigure the aircraft between jobs, said Roedts.

"The more configurable the aircraft, and the faster you can do it, the more capable a product it is to your customers," he added.

FUTURE GROWTH

What does the future hold for the company more broadly? Bandy said Columbia will look to take more advantage of its extensive MRO/manufacturing capabilities — illustrated by the announcement last year that Columbia would be taking on production and support for GE Aviation's T58 and CT58 engines (powering aircraft including the Boeing CH-46 and 107-II, and Sikorsky SH-3, S-61, and S-62). Under the agreement between the two companies, GE licensed Columbia to produce all procurable spare parts under a Federal Aviation Administration (FAA) Production Certificate, utilizing OEM drawings and specifications.

"We have finally realized that we had built the capability that was so honed and so proficient, in support of ourselves, that it would serve as a good support system within the general market," said Bandy.

"As a matter of fact, with Bristow, that was kind of our concept: that we would deploy our capabilities to the benefit of their organization," he added.

"Now we will just look for the opportunities to replicate that process more broadly in the engine MRO/manufacturing segments."

Another avenue for growth is in the 234 itself, which is due to further evolve in the hands of Columbia's engineers. "Part of the plan is to advance the 234's performance capabilities and the technology incorporated into the aircraft," said Bandy, adding that the company is considering rebranding the next generation of the type as the 234-II. "We have never really taken credit for the fact that that aircraft has evolved fairly significantly over the time that we have operated it," he said.

All told, it's fair to say the team at Columbia is positive about the opportunities presented by a changing industry. Under new ownership and driven by its famously tandemrotor fleet. Columbia is ready for significant growth.

"This company has always risen to challenges, and we are very excited about what is in front of us with this new ownership and their plan," said Bandy.



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Passing TESING

TEXT BY ELAN HEAD // PHOTOS BY AUGUSTO HERRERA

What makes a helicopter fuel system crash-resistant? Flexible fuel bladders are part of the equation, but the ability of a tank to withstand crashes depends on every aspect of how it is designed and built.

To learn more, we paid a visit to Robertson Fuel Systems in Tempe, Arizona, to witness production of the crash-resistant fuel tank (CRFT) for the Airbus H125/AS350 AStar series. Robertson and its partner and supplemental type certificate (STC) owner StandardAero have invested heavily in developing their CRFT solution for this popular light helicopter, which has a tragic history of post-crash fires. The tank is now certified to the stringent requirements of Federal Aviation Regulations 27.952, which includes approval for operations with external cargo equipment (e.g. the factory hook or cargo swing) installed. The tank is compatible with virtually all models in the series, from the AS350 B/D to the latest H125, and including the EC130 B4.

As Robertson and StandardAero explained, however, getting there wasn't easy. Even now, production of the CRFT remains a labor-intensive process with many steps. All of which means that it isn't cheap — but an increasing number of customers are deciding that it's worth the investment.

The StandardAero/Robertson H125/AS350 CRFT on display in Robertson's Tempe, Arizona, showroom. The tank features a TSO C80-certified rubber bladder inside a non-riveted, carbon-fiber container, with a self-contained vent system with roll-over valve, and self-sealing breakaway valve. The tank uses quick-change cartridge-style fuel pumps, and is available in both single- and dual-pump configurations. It contains the same amount of usable fuel as the original tank (143 gallons), although a slightly higher quantity of unusable fuel. Robertson and StandardAero estimate that their tank can be installed in the field in about 32 labor hours, without the need to jack up the aircraft.



Robertson Fuel Systems was founded in 1976 by Dr. S. Harry Robertson, a pilot whose pioneering work in developing crashworthy fuel systems was informed by the U.S. military's experience with postcrash fires in Vietnam. The company has historically focused its efforts on military helicopters, and its fuel tanks are currently installed on U.S. Army Black Hawks, Chinooks, and Apaches, among other platforms. The company also produces Forward Area Refueling Equipment, which, along with Robertson's crashworthy auxiliary fuel tanks, supported the raid on Osama bin Laden's compound in Abbottabad, Pakistan, in 2011.





A warehouse at Robertson's Tempe facility contains material from decades of development and certification testing. Robertson had done some preliminary engineering on an AS350 CRFT years ago for a military competition, but shelved the project until separate project cooperation with StandardAero presented an opportunity to tap into that company's STC development expertise, prompting Robertson to revisit the tank in the context of increasing public attention on post-crash fires. Arriving at the final design proved more challenging than the engineering team had expected. Initially, they had planned on using a roto-molded plastic container for the tank, but when it became clear that this wouldn't pass Federal Aviation Administration (FAA) certification testing, they switched to the current composite shell, strategically designed to help distribute impact loads in a crash.



For certification, Robertson and StandardAero drop tested their H125/AS350 CRFT in an actual aircraft structure, with the landing gear removed and an Airbus cargo swing and Onboard Systems cargo hook installed. According to Robertson director of engineering Bill York, it took "many, many iterations of containers and sump plates" to arrive at a design that could withstand the penetrating force of the swing and cargo hook. While working through these hard problems, Robertson manufactured its own, less expensive cargo swings in-house for use in development drop testing.



The concrete pad where Robertson conducts its drop tests. The FAA requires that tanks be dropped from a height of 50 feet while 80 percent full of water (approximating the mass of the tank full of jet fuel, which has a lighter density than water). The U.S. military generally stipulates that tanks be dropped full of water from at least 65 feet, but does not require that they be dropped in a representative aircraft structure.

The table that Robertson uses for its "slosh and vibe" tests. Driven by hydraulics and electric motors, the entire table tilts back and forth to simulate the motion of an aircraft in flight, which creates "sloshing" in the fuel tanks being tested. Adjustable eccentric weights attached to the motors are used to create vibration that mimics the vibration of a helicopter. Each fuel tank design undergoes around 25 hours of this slosh and vibe testing.







Robertson makes the composite container for the H125/AS350 CRFT in-house using preimpregnated carbon fiber and fiberglass.

In the past, Robertson has outsourced production of its fuel bladders, but it is now developing that capability in-house, starting with bladders for several military models (not shown). The bladders, which are made from a synthetic rubber-like material, are laid up and oven-cured much like other composites. Robertson makes test coupons for each composite container and bladder, so that it can track manufacturing quality long after each product is shipped.







TOP LEFT: A technician at work in Robertson's rigging and harness shop. The H125/AS350 CRFT is attached to the aircraft using two proprietary straps that are especially strong and durable.

ABOVE + RIGHT: The hose assembly department at Robertson's Tempe facility. All hoses are pressure-tested following assembly.



The tank assembly process. Because production volumes in the aviation sector are relatively low compared to other industries, Robertson sees little benefit to greater automation, and its manufacturing remains high-touch. Robertson employs more than 150 employees across its facilities in Tempe and Bluffdale, Utah.





After each tank is assembled, it is connected to this unit for acceptance testing, which checks for leaks and ensures correct gauging and pump operation. Each acceptance test usually lasts between one and one-and-a-half hours, and uses a special solvent, rather than jet fuel, for safety and environmental reasons.

A crated fuel tank ready for delivery to the customer. Elvis Moniz, StandardAero VP of business development for airframes and avionics, said that he's seeing interest in the H125/AS350 CRFT from all sectors of the helicopter industry — from police and EMS operators, to private owners who are "concerned about taking care of themselves." To date, 145 CRFTs have been delivered to customers in the United States, Guatemala, Australia, and Europe.



A row of H125/AS350 CRFTs on Robertson's shop floor, with their military-standard high-pressure, crashworthy, lightning-safe fuel caps visible. Immediately following certification of the tank, the company developed a backlog as it worked to ramp up its production capabilities and fulfill the large order from launch customer Air Methods. However, Robertson has since reduced wait times to just two or three months. The company is now producing around 10 to 15 of the tanks per month, and could increase that number if demand dictated. (Note that the straps on these tanks are for ease of handling, and are not the straps that attach the tank to the aircraft.)







pilot at a time." Even after all these years, and more than 26,000 hours as a certified flight instructor and certified flight instructor -instrument (CFI/CFII), Tu remains hands-on in the cockpit with his students.

Tu was born in China, but immigrated to the U.S. from Taiwan as a teenager in 1965. There, he pursued his dream of flying and attaining his private and commercial pilot certificates. Drafted into the U.S. military in January 1970, he served with the Army's 173rd Assault Helicopter Company, maintaining and test-flying the Bell UH-1 Iroquois "Huey" in Vietnam.

When he left the Army in 1973, Tu worked at Hughes Helicopters in Culver City, California, manufacturer of the Hughes Model 269, Hughes 300, and Hughes Model 369 (OH-6/Hughes 500) light helicopters.

Initially, Tu worked in administration in the manufacturing operations division. In 1979, he was reassigned to the company's flight department as an operations fixed-wing pilot. His role was ferrying personnel between the Culver City manufacturing/assembly plant and test facilities at Palomar Airport and Mesa, Arizona. He later moved to helicopter production, flight testing the Hughes 269 and 369, and also provided flight support during flight testing of the Model 77/YAH-64, which became the AH-64 Apache.

By 1987, Hughes had sold the helicopter product line and manufacturing was taken over by Boeing and MD Helicopters in Mesa. Tu chose to leave the company, unwilling to uproot his family from their home in California.

ESTABLISHING A COMPANY

Back home in familiar surroundings at the Palomar Airport, he worked briefly at a small flight school until it closed and Tu took over some of the assets — acquiring two Hughes 300s that became the cornerstone of his own new business, Civic Helicopters.

Instead of promoting the company as a full-service commercial operation, Tu focused on helicopter flight training.

The following year, the San Diego Police Department (SDPD) approached Civic with what became an important opportunity for the small flight school. The agency acquired two Bell 206s during a property seizure in a criminal case and created the SDPD Airborne Law Enforcement (ABLE) program. Civic provided training for pilots and guidance as the unit developed. The success of the contract and the stature ABLE would eventually earn among law enforcement operators gave Civic valuable industry exposure. One of the first SDPD pilots to train was Kevin Means.

Throughout his career, Means spent considerable time training with Tu before retiring in 2013 as the agency's chief pilot.

"I have nothing but praise for Chin Tu. I have met very few helicopter pilots in this world that are as knowledgeable and as skillful," said Means. "He's one of the smartest, most natural pilots I have ever seen. I feel so fortunate to have trained under him." While Tu's knowledge and competency as a flight instructor made him sought after by domestic students, his fluency in his native language, Mandarin, put him in a unique position and made



Instructor pilots Candise Tu (left) and Sarah Blanton (right) prepare Chinese student Ying "Sunnie" Xie for her upcoming CFI check ride.

him highly sought after by a rapidly emerging international market.

Over the past 10 years, China's civil helicopter market has experienced remarkable growth. The number of civil aircraft registrations has swelled with an annual growth of nearly 20 percent. Also, the Chinese government entices original equipment manufacturers (OEMs) to bring production facilities to their shores.

As a result, Chinese operators and students are scrambling to identify sources for primary and advanced flight training. Tu believes language is the biggest hurdle for foreign students, and competent Mandarin-speaking flight instructors are key to ensuring their success.

Civic's reputation and capabilities are well known in the Chinese helicopter community. Organizations including the Shanghai Municipal Police and the Civil Aviation Flight University of China (CAFUC) have contracted with Civic for all levels of flight instruction. CAFUC, an institution similar to, but larger than, Embry-Riddle, has cycled their entire cadre of helicopter flight instructors through Civic, to improve their knowledge, flying and teaching skills.

Tu also aided the Chinese in developing a helicopter safety program to address an alarming trend of accidents associated with pilot error.



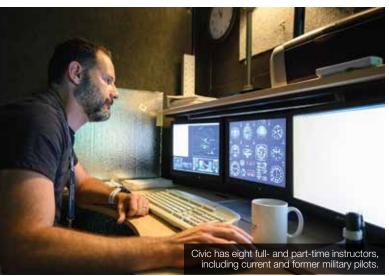
"Being able to speak Chinese, being a flight instructor and understanding the culture, we are better able to assess a student's level of understanding and determine what method of training best suits them. We use that approach with all students."













A FAMILY BUSINESS

Tu's daughter, Candise, is Civic's vice president of operations, a helicopter CFI, and is fluent in Mandarin. Since 2011, she has spent considerable time working in China to promote helicopter safety.

"Being able to speak Chinese, being a flight instructor and understanding the culture, we are better able to assess a student's level of understanding and determine what method of training best suits them," said Candise. "We use that approach with all students"

In 2018, Robinson Helicopter introduced Tu as the company's director of flight safety for China. He and Robinson chief instructor Tim Tucker traveled to China to visit Robinson dealers, and announce Robinson's international safety course would be provided by Tu in China. More recently, Candise was brought on board as a Robinson's safety course instructor.

Civic's operation base remains at Palomar Airport. While Federal Aviation Administration part 61 and the more structured and regulated part 141 operations are the primary focus for instruction, limited single pilot part 135 charter work is available using an R44. The business is also an authorized service center for Robinson and Schweizer RSG helicopters.

In addition to Tu and Candise, there are eight full- and part-time instructors, including current and former military pilots; some with more than 1,000 hours of instruction experience.

Nancy Baccheschi is one of Civic's instructors. An active duty United States Air Force LCol, she also attended Civic as a student.





"I was an instructor flight test engineer at the U.S. Air Force Test Pilot School (TPS) in 2013," she said. "The school contracted with Civic to bring an R44 up to fly with the TPS students. The next week I was down at Civic doing my first flight toward my private license. I enjoyed flying so much, especially flying at Civic. I felt comfortable with the helicopters and had faith in the maintenance standards, so I just kept going. Ten months after my first flight toward my private license, I had my CFI and began flying for Civic."

Another home-grown instructor is Andrea Tornielli. Italian-bornand-raised, he earned his commercial, instrument, CFI, CFII and Airline Transport Pilot ratings while training at Civic.

"The safety culture at Civic is a reflection of the way Chin flies," said Tornielli. "It has always struck me, seeing the connection that he has with the helicopter, while he demonstrates emergencies and his ability to break down difficult concepts in ways that everyone can understand — he's the backbone of the school."

Ying "Sunnie" Xie is one of Civic's Chinese students. She has earned her private and commercial ratings and is working toward her CFI.

"The first time I came to Civic was in 2013 with my dad for his emergency training with Chin," she said. "I guess my dad always wanted me to get my own license at Civic, ever since he saw how

extraordinarily well Chin flies, takes care of the aircraft and runs the whole business."

AN EVOLVING FLEET

Civic's primary training fleet consists of five Robinson R22s and three R44s. Two Schweizer 300Cs are also available, typically used by law enforcement pilots and other students going back to fly a fully articulated rotor system. They also operate a Bell 206B-3 and a Bell 505 Jet Ranger X.

Tu is excited about the potential of the 505, pointing out the aircraft's more spacious cabin, glass cockpit and available power over the legacy 206 series. While the 505 is new in the market, it has already been sold in large numbers in China, with predictions for many more to follow over the next five years.

However, he believes some of the 505's controls and instrumentation — including the dual full authority digital engine control, two-position fly/idle throttle, and glass cockpit — will require carefully developed course content, especially for foreign students, in order to accurately describe and teach the 505's idiosyncrasies and operational best practices.

With his test-flying background, Tu was inspired to develop what he believes are improved procedures for the 505. For example, on approach to landing in a classic in-flight tail rotor failure situation,





storage/maintenance, administrative suites, and a number of second-floor class/meeting rooms.



the right yaw cannot be managed using traditional methods prior to touchdown because the 505 has no manual throttle. Tu's technique takes advantage of what he describes as "predictable and dependable" engine torque reduction that occurs when the throttle is switched to idle.

Another recurring problem for pilots, which affects all makes and models of helicopters, is the loss of tail rotor effectiveness (LTE).

"Chin has realized that in the timeframe available to teach pilots emergency procedures, there is a lot of confusion that was never fully clarified for the pilots in training, and there are misconceptions," said Candise. "For instance, many pilots have never seen a demonstration of recovery from LTE in a cockpit and have never performed a recovery in training."

Tu ensures every pilot earning a rating or certificate at Civic experiences the phenomenon, first recognizing the eminent LTE condition, and then acting to prevent it, learn and practice recovery procedures for LTE at hovering and in slow flight.

"It's only a matter of time before LTE catches up with any one of us at the worst moment," he said. "The very recent accident with the Bell 206 that went into the Hudson River is already being used as an example when discussing LTE with our students and instructors, and also a testament to how much of an issue this is."

He believes there is considerable room for improvement in the overall helicopter training industry and is concerned about courses of instruction that train only the practical test standards and nothing more.

"As trainers, we need to innovate. The aircraft are continuously being innovated and improved, so we, as trainers, need to do that as well," he said.

In the decades since SDPD reached out to Tu, Civic has trained countless local, state and federal agency pilots. The company has welcomed students from more than 35 countries, including foreign military operators, and continues to conduct helicopter training for Robinson Helicopter and the USAF Test Pilot School at Edwards Air Force Base in California.

Through various training endeavors, Civic's instructors embrace Tu's passion and commitment to flight training and producing truly exceptional pilots.

"We train well beyond certification," said Candise. "I often tell people that I try to get them to the standard of what I would be willing to hire. Chin is what sets us apart, hands down, and he's why we're all doing our best to ensure he can continue to fly and teach for many years to come. He's a finite resource and, someday, I'll take over and continue the 'saving one pilot at a time since 1974' tradition."



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

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The sweet song of Gabonese voices swells in harmony through the open windows of Cathédrale Saint Louis and drifts to the rooftop patio of Hôtel Loisirs Mandji. To the north, a football match unfolds. I shift my gaze east, towards Cape Lopez Bay, as a Dauphin helicopter skirts across the sky. I spend most late afternoons on this rooftop, but tonight will be the last. I am in Port-Gentil, Gabon — a small town on a narrow peninsula that reaches out into the Atlantic on the west coast of Central Africa. Yet another contract in Africa has come to an end, and we are to ferry the aircraft north to Poland and storage.

The horizon finally devours the great red sun. The sky blooms into warm hues of pink among massive thunderheads far out to sea. The pinks deepen into strong reds with yellow bands artfully brushed across the sky as the fiery brim of the sun wavers. I watch the sky churn into a maelstrom of crimson, then head downstairs to join my friends for dinner.

I love Gabon. During our time there we occasionally flew our Super Puma down the coast to Gamba for the afternoon, where elephants roam freely through the village. This is a proper jungle, on the edge of the equator. While there, as we waited for hours under that equatorial sun, I would hike down tunnels of foliage cleared by elephants, among the song of the cicada, careful for snakes or crocodiles along the waterways.

But while Gamba has its elephants, and Libreville, the capital of Gabon, has its charm, it was Port-Gentil that had been our home for the past nine months. We took deep sea fishing trips far offshore, spent afternoons on the gorgeous beaches, snorkeled and biked, dined and laughed. The people are wonderful; the French cuisine, incredible. We favored Le Bistro, Chez Tantine Nanou, or the classic Café du Wharf. The latter is a longstanding diner with ceramic tiles in exotic motifs, colorful orange walls, bright yellow tablecloths, elegant dark wood furniture, pink and purple drapes, and black and white







photographs hung amid local artwork and crafts. Diners can enjoy unusual dishes for Western palates, including caiman and forest antelope.

Evenings are spent playing pool at the Iguana Cafe, with its live music and eclectic crowd. During one such visit, I was blown away when the local lads laid into an eerie rendition of the Pixies' "Where Is My Mind?"

BEGINNING THE JOURNEY

In the morning of our departure, the two Super Pumas are prepped for flight. Since the downturn in the industry, layoffs have been aplenty in the offshore sector, so all that remains are the old-timers. As a result, there's no pilot on this trip with less than 10,000 hours. My co-pilot has far more time than I do, and has flown this route a dozen times. So we plan to take turns; I'll fly right seat to Spain, then hop into the left seat and run the radios through Europe.

After a brief delay due to some issue with the Port-Gentil authorities, I pull one of the old girls into a hover, push over the nose and climb into the wind, turning north towards Libreville to begin the long journey to Poland. We have pored over maps for weeks, got all the permits in place, and prepaid for fuel at all the stops on our journey. We have a lot of U.S. dollars hidden onboard, as cash is king in Africa. The route is not difficult; keep the sea to your left and head north.

We fly into harmattan — an annual weather pattern in West Africa that brings dry, dusty winds — somewhere abeam Cameroon, and visibility reduces to pretty much straight down. We continue north to Port Harcourt, Nigeria.

Having been designated the money guy for the trip, it's my job to deal with the driver of the ancient fuel truck that rattles up. Apparently, our prepaid fuel has not been sorted and the driver advises us that a trip into a Port Harcourt bank is required. It will take all day. Perhaps we

will have to spend the night... or we could pay cash? It's too early to delve into our cash reserves, so I begin my act. I'm happy. I'm beaming. I'm more than willing to take a trip into a Port Harcourt bank, and maybe grab some lunch with my new Nigerian friend? He is not so impressed. I push harder.

"Let's go into town, buddy — I want to see Port Harcourt!"

He pulls out his phone and has a quick discussion. It seems the payment has gone through after all and everything is golden, so no delay is required. I've been flying around Africa for the past decade, so this is not my first kick at the can. With full tanks, we soon depart and climb back into the dust.

Further north, Lagos harbor is littered with rigs. It appears that the downturn in the oil industry has hit hard everywhere. We push on down the beach into Cotonou, Benin, for the night.

We land, and my co-pilot takes all the paperwork, ferry permit and whatnot, into the Agence Nationale De L'Aviation Civile (ANAC) office across the ramp, while I help the engineers tie down the blades and install the covers for the night.

A military jeep suddenly pulls up, and then men that get out are yelling at us, asking who gave us permission to land. I calmly tell them we have a flight permit and tower gave us permission to land. They yell some more and another truck arrives, followed by a third. The growing throng of people are all unhappy with our arrival. What are we doing there? What right have we? I tell them to follow me into the ANAC office, as my compatriot has gone in with all the paperwork and required payments. I start walking across the ramp, motioning them to follow. No one does. They all disappear.

After dinner at a nearby resort, another old Africa hand asks if I want to walk into Cotonou and hit a bar we saw on the drive in. Sure, why not? I remove my watch, phone, and wallet, and slip enough cash into



my pocket for a short night in town. Off we go.

After a couple of beers, it's getting late, and we saunter on back to the resort. Two lads on a motorcycle cut us off. They carry AK-47s. I can't quite fathom their uniforms. Police or military? I can't say. They aren't happy. They demand paperwork. We don't have any. They say they will take us to the police station and we will be arrested and spend the rest of our days in a Benin prison. We shrug and follow them — they've got guns.

They take us on a long walk to a large gentleman who is angrier than they are. He demands our passports and photographs them. He yells at us some more. I should be somewhat worried, but all I can think about is how great of a story this is going to be. More yelling. My buddy doesn't speak any French, so the youngest of the lads in uniform pulls me aside and tells me my friend is being obnoxious and they might have to hurt him.

"Nah, you don't have to hurt him, he's just obnoxious when he's scared," I say. The lad rubs his chin thoughtfully. He goes over and talks with the large man. He returns and asks me how much cash I have on me. He could have started there — we've been at this for over an hour now; if this was just a shakedown, why all the drama? I pull out my pockets to reveal \$40 and some change. My friend reluctantly does the same. They relieve us of the contents and send us on our way. We almost make it to the resort when the motorcycle lads stop us again. We are marched back to the large angry man who hands us our change and waves us off again.

HEADING WEST

The next morning we make the short haul up the beaches of Togo for an early night in Accra, Ghana. This is a treat, especially after Benin. Everyone has a splendid night. I'll skip the details.

Early the next morning, we launch for Abidjan, Ivory Coast. There are a plethora of United Nations aircraft on the ramp — a legacy of the Second Ivorian Civil War, which lasted several months in 2011 — but little indication of trouble on the ground. In fact, we are all impressed

with downtown Abidjan, appearing as modern as any city anywhere. I'm led to a backroom across the ramp where the official seems to pull more charges out of the air, and we have little choice but to pay. Fuel payment is also an issue, so I tell the refueler that I have to make a few phone calls to ensure the prepayment is canceled before I pay cash, as we can't pay twice. The prepayment is accepted before I complete the call and we are soon off again with full tanks.

After overflying the downtown hub, we decide a low level run up the country is in order. While the route is mostly uninhabited forest, it becomes apparent that we startle the odd village, as everyone runs for the trees as we pass overhead. We climb a few hundred feet and soon pass the impressive Basilica of Our Lady of Peace of Yamoussoukro, a huge church just south of the city. Things are much easier at the small Yamoussoukro airport, and friendly to boot. Small fees are paid, fuel is taken with no drama, and we launch for Liberia, Monrovia.

We eventually cross the border and call the tower. We are asked how many souls onboard at least a dozen times. As we approach, they request an altitude that does not clear the hills to the east of the airport. We use some discretion. Once at the airport, amid numerous white U.N. birds, we are met with a large bus. We are only 60 feet from the airport offices, but are advised we must take the bus. They charge us \$500 for the ride. We pay all the exorbitant fees, but they are not made up on the spot — there is a printed list of the services provided and the going price. I even get a receipt.

The Liberia Ebola scare has just been declared over, but hand washing signs everywhere remind us of the horror that recently plagued this pretty country. We grab a van into the RLJ Kendeja Resort & Villas. Ladies in colorful kangas with large loads on their heads amble down the red dirt roads. Kids play everywhere. Chickens run about. It feels like quintessential Africa. The resort is a pleasant spot on the beach with boardwalks running to and fro.

The following morning, we are soon airborne again, and claw our way for the next horizon. We fly over the diamond mines of Sierra Leone before settling into Conakry, Guinea. There, I offer chocolate bars to

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anyone who wants one. Things move quickly and everyone is friendly. It's a pretty spot, but only a fuel stop for our two Pumas. We've heard numerous horror stories of pilots on ferry trips being arrested in Guinea-Bissau, the country we pass next. One fellow recommended a low level run far offshore with the radios off, but we elect to cut straight across towards Dakar, Senegal. We call in like the good boy scouts we are, and of course, they demand that we land at their airport. Our radios cease to function.

Dakar is quite a sight! Tower allows a circuit around the impressive African Renaissance Monument (a 50-meter-high statue on a 100-meter hill) before parking us way out in the nether regions of the airport. Paperwork is again a headache, then we grab a bus into the opulent King Fahd Palace Hotel on the most western edge of the African continent. The rooms are gorgeous, but we soon meet up at the seaside patio, where U.S. Embassy personnel are having a blowout and cannonballing into the pool. Dakar is amazing, so one of the birds has a "mechanical" and we spend an extra day. We see a few sites in town before hopping a boat out to île de Gorée, a slave trading post used between the 15th and 19th centuries. We hope it will be historically enlightening, but are hounded by street vendors from the moment we arrive until our departure late in the afternoon.

DESERT SANDS

We depart early the next morning back into the sands of harmattan, climbing above it for the clear blue skies of the Western Sahara.

Next stop: Nouakchott, Mauritania. Ah, dusty Nouakchott, where fine sand irritates the eyes and coats the teeth. Visibility is less than a mile, so all we see as we line up for the runway are the rows of ancient square domiciles of town. Again, our fuel prepayment is an issue, but we handle it as before and make a quick turnaround of the stop.

Our route now took us over Western Sahara. I had spent months in Morocco on other contracts but had never been to this region. On previous contracts, we had driven into the desert and rented camels for forays into the dunes and explored the Atlas Mountains, but this was the real deal, with sand dunes stretching beyond one's imagination. The only water we had onboard was this iron-enhanced crap I picked up in bulk in Libreville. It tasted horrible, so we had passed bottles off where we could, and it was now getting low. Next stop, we'd stock up with something drinkable.

No one wished to put down out here. At times you'd see random nomads and stray camels, but for the most part, the Sahara is more barren than anything I had encountered in Canada's North.

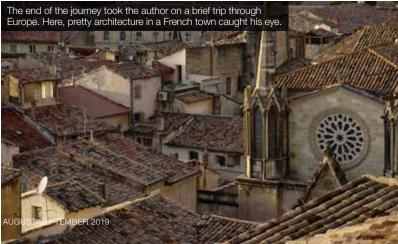
The city of Dakhla appeared more inviting, perhaps due to having left the dust-laden skies behind us. It's a small coastal settlement on a thin peninsula of sand that ventures out into the Eastern Atlantic, where the sky is impossibly blue. We arrive after a long day as the sun sets. Here, the fees are negligible, but the bureaucracy maddening. We spend hours sorting everything with a lone official, before being allowed to venture out into the parking lot. There are no taxis but a local fellow offers a ride to the Hôtel Bab Al Bahar, an enchanting establishment with friendly staff who thankfully serve gin and tonics. The driver accepts no fare for three trips from the airport to the hotel.

I step down narrow stairs into the coolness of the cement, then into the lobby. I admire the simple painting above the ornate couch and wait for the concierge. The credit card system does not work, and local cash is required. There is a bank up the street and there is no rush, "Just pay before you leave please, sir." We drop our bags and wash the dust from our faces, then make our way down to the open-air restaurant that overlooks the water. We dine on tender lamb stewed in tomatoes while the lights of small boats dally past in the Bahía de Dakhla.











NORTHERN AFRICA

We have a mechanical issue the next morning, but thankfully it's quickly sorted, as this would not be an easy place to get parts into. We launch for Laayoune then Agadir, flying low up the crumbling sand cliffs that border the heaving Atlantic. The dark mountains of the Anti-Atlas range are to our right, and the snow-capped peaks of the greater Atlas range unveil themselves as we draw north. We spot crumbling walls of Kasbahs (ancient forts), and more villages appear as we continue. Rivers from the mountains feed the sea, and green fields line their banks. We pass over a bizarre mosaic made up of vast fields of white rectangles (it turns out they are air-conditioned greenhouses that cover the entire area). After a while, a glare on the surface catches the eye, like the sun itself had fallen to earth. Behold the Ouarzazate Solar Power Station, the world's largest solar energy project.

Agadir had been my home on two separate long-term contracts in the past, so I was very familiar with the place, and we now developed a legitimate maintenance issue that required parts. We booked into the 5-star Hotel Sofitel on the beach and let loose!

The first meal following a long walk down the Agadir beach promenade was Le Mauresque Lounge for succulent tajine d'agneau aux pruneaux. This is one of my favorite restaurants on the planet, right up there with the Tamarind in Mombasa, Kenya.

We rented dune buggies and raced into the Atlas Mountains and visited local Kasbahs for mint tea, then bartered with Berbers in blue for fine hand-hewn carpets. Some spent the days in the resort's spa or poolside with a good book. No one was in a hurry to push on, but all too soon we were airborne again, filing instrument flight rules (IFR) as restricted airspace littered the landscape. We topped our tanks in Casablanca, then flared into Tangier Ibn Battouta Airport in the late afternoon. The official who met us was pleasant and pushed our paperwork through without drama, and even gave my name and number to her uncle for a trip through the city in the wee hours the following morning.

I was up early and walking the Ancien Medina with the official's uncle, checking out the cafes frequented by William S. Burroughs, Paul Bowles, Jack Kerouac, and Allen Ginsberg. From the '20s well into the '50s, Tangiers was known as a place where anything could be bought for a price, a mythos that attracted expatriate artists and writers.



THE FINAL STRETCH

The aircraft remain serviceable, and we are airborne mid-afternoon for Spain. Reports of migrants' failed attempts to cross into Europe fills the news daily, so we keep our eyes peeled on the Strait of Gibraltar below us, but only see commercial vessels. Back over land, we pass over 100,000 acres of greenhouses, supplying much of Europe's vegetables, then flare into Almería, Spain. I am sure Southern Spain is gorgeous, and one of the engineers worked forest fires here for a few seasons and loved the region, but it is a holiday the day we land and everything is closed, the hotel is nondescript, and the only place we can find open is a Taco Bell at a strip mall. We are already missing Africa.

We take off for Ibiza and fuel, then travel on into Montpellier for unseasonably cold South-of-France weather. A snooty refueler eventually gets the Jet A flowing, but our engineers find a rather serious item on the post-flight checks, so it looks like we'll be exploring the area for a few days, despite the cold and rain.

Eventually the parts arrive, and we depart for Dijon, the land of mustard and the Breitling Jet Team. We had planned our route through the Alps, but a massive low pressure drifting through the region, especially in winter, makes us reconsider. The service is much friendlier in Dijon, but the weather is terrible. It is near freezing, and these Pumas do not have the flight-into-known-icing capability of the Pumas I flew out of Halifax offshore for a decade, so we are compelled to low-level scud run through Europe. It's that or stay put. We chat to a local medevac helo pilot, then elect to continue on.

We push up to Luxembourg and have issues with the tower, but must spend a day there to wait out more poor weather with a hike through town. I prefer Port-Gentil to Luxembourg any day, and was glad to be on my way.

We shoot for Prague, but are soon dodging hilltop castles and wind towers, and crawling through the treetops. We drop into lower country and divert to Nuremberg, Germany. The weather worsens, so we end up staying for a few days.

One of the pilots is a history buff, so we make a foray out to the Nuremberg trials museum, the Nazi party rally grounds, the Imperial Castle of Nuremberg, and countless basement beer halls for bratwurst and sauerkraut. The classic bratwurst houses typically have large

tables where everyone sits together. We sit with two couples well into their 80s who grew up here in Nuremberg. We do the math and wonder what they had seen.

Once the weather finally lifts, the next stop is Prague. Everyone loves Prague! We stay at the opulent Grand Mark Prague. I've stayed in some swanky places in my day, but this is the cake. I have two floors, a spiral staircase, a hot tub on the second floor, a patio with a view out into a wonderful garden, and more furniture than I have at home (and I'm pretty sure none of it was from Ikea). We visit the St. Nicholas Church and spend the day exploring all of the old city and fine dining. Compared with much of my experience of Europe, Prague is friendly and inexpensive, with the most stunning architecture I've ever seen. (At least two of the crew have taken their families back to Prague since the ferry trip.)

We take off on a sunny morning and climb through a scattered layer to get above the mountaintops and cross into Poland. As we settle on the oleos at the hangar in Rzeszow, I know it could be my last flight for a good while. (I'm not wrong — there is no work for the Pumas in the near future, so we are all laid off as soon as we step off the airplane back home.) We spend a couple of days exploring Rzeszow, then I'm back in Halifax, Nova Scotia.

We covered nearly 7,000 miles (11,265 kilometers), crossing 23 countries in 25 days. We were swindled in Nigeria, robbed in Benin, mobbed in Dakar, beaten over the head with bureaucracy in Morocco, annoyed by the French, frustrated in Luxembourg, fell in love with Prague, and throughout it all, became good friends. It was a bittersweet adventure, with mayhem intertwined with awe, every one of us pushing forward to get the job done. Ever the professionals, we did what we do best, right to the end.

This story was first published on therotorbreak.com.

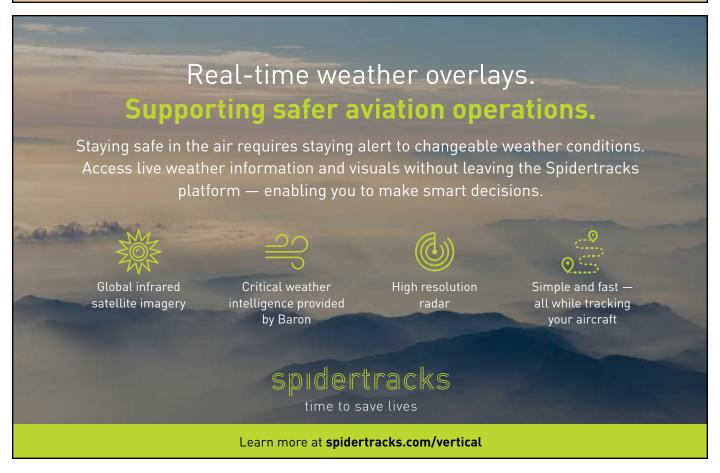


Darcy Hoover Darcy has spent over 30 years flying in more than 30 countries. He is currently flying AW139s in Trinidad and Tobago, but between visas and locations he managed to write his first novel, *The Helicopter Pilot*.



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WEST COAST ADVENTURERS

Vancouver Island has a reputation as a place of stunning natural beauty, combining mountains, towering rainforests, beaches, and an island-dotted coastline. The south of the island is relatively easy to access and firmly on the tourist trail. It's also home to the island's largest cities - including British Columbia's capital, Victoria.

Venture to the north of the island, however, and the population thins dramatically, providing a very real sense that you're on the edge of the wilderness — and in a land where natural resource extraction (in this case, logging) still plays a key role in the economy. Visitors here can hike the Cape Scott Provincial Park at the tip of the island, kayak the pristine waters, go caving, or enjoy the scuba-diving, fishing or camping opportunities it provides.

This part of the island also serves as a gateway to British Columbia's beautiful, but largely inaccessible central coast, home to several world-class wilderness activities, such as heliskiing and heli-fishing.

For the last two-and-a-half decades, West Coast Helicopters has served as the vital connecting piece that enabled this wilderness tourism to

Whether flying loggers to remote forestry camps or high-end wilderness tourists to luxury resorts, West Coast Helicopters has established an enviable reputation for quality along British Columbia's rugged coastline.

BY OLIVER JOHNSON
PHOTOS BY
HEATH MOFFATT

with a breadth of operations that reflect its environment. It was built around supporting the forestry industry, and this remains a key part of its business, including some highly specialized operations. It also provides firefighting support when needed, along with environmental and wildlife work and charter services. And on the maintenance side, third-party maintenance, repair and overhaul (MRO) support promises significant growth opportunities in the future.

establish.

grow, and ultimately

flourish. But it's

far from a one-

trick company,

Based in the small town of Port McNeill on the northeast shore of Vancouver Island, West Coast Helicopters was established in 1993 by three partners: Peter Barratt, Terry Eissfeldt, and Wayne Finn. The three had worked for Canadian Helicopters at its base in the town, and when that company announced it would be making changes to their operation, Barratt, Eissfeldt and Finn decided to branch out on their own.

"I think the biggest thing we had in common was that we loved what we do," said Eissfeldt. "Peter and Wayne loved flying, I loved maintaining, we loved doing a good job, and we looked at each



other and said, 'We won't work any differently, any less or any more. We already put our lifeblood into how we do things. We can't help but be successful in starting our own company.' "

Each brought their own area of expertise to the new company, with Eissfeldt's being maintenance, Barratt providing flying expertise and local knowledge, and Finn's specialty being the business side of operations.

The company was set up at Port McNeill Municipal Airport in the great outdoors — having no hangar — with the support of forestry operations providing the bulk of its work. The trio leased a Bell 206 and an AS350 B AStar, and began work under another company's Approved Maintenance Organization (AMO) and Operating Certificates.

"Those were great days — we were busy being busy," said Eissfeldt. "We were hoping to get a good chunk of the work, and Peter had such a good reputation in the local area here that people only wanted to fly with him. They knew him, he was a fun, gregarious guy, he knew what he was doing, and it was safe. This region is a very difficult area to fly in at the best of times — just because of the geography and the weather conditions at any given moment. And so we didn't just get a good chunk of the flying; we got all the flying."

The three partners planned to be working under their own operating certificate and AMO within a year. Thanks to their successful launch, they not only achieved that aim with time to spare, they had also built their own hangar within the first 12 months.

"We built that in between flights," said Eissfeldt. "I'd be pouring concrete and putting up walls, insulation and everything else — so we started from a real grassroots level."

GRADUAL GROWTH

Growth at West Coast Helicopters has been gradual but steady over the years, with leased aircraft replaced by owned aircraft, an increase in staff and fleet size, and an expansion along the British Columbia coastline.

It now has two more bases down the east coast of Vancouver Island (in Campbell River and Nanaimo), and one on the central coast of mainland British Columbia (Bella Coola). Each has its own hangar, base manager, and staff.

The first base expansion took place in 1996, shortly after Finn left the company. Barratt and Eissfeldt were discussing future plans and opportunities, and thought a presence in Bella Coola would be worth exploring. After a few years there, they built a hangar and crew accommodations and grew the base.

The move to Campbell River and Nanaimo came in 2000, following the purchase of Long Beach Helicopters. The acquisition provided staff and aircraft (four AS350 B AStars), as well as bases in those locations. The more recent purchase of Peak Helicopters added further aircraft and facilities in Campbell River.

Today, about 65 people work across the company (although this does vary according to the season), including about 36 pilots and 15 maintenance staff.

Forestry work still makes up a large part of the company's business (roughly 50 percent), but the flourishing wilderness tourism work in the region is also a significant source of revenue (40 percent).

West Coast Helicopters' business was built around the AS350 AStar and the Bell 206, as those types were best suited to the

local market requirements, said Eissfeldt. "People really enjoyed the AStar for the additional capability of more passengers, more speed, and more load," he said. "The JetRanger was for the people that were only doing the twos and threes and doing quick hops."

As the company grew over the years, its fleet swelled from two to 18. These include six Airbus AS350 B2s, two AS350 BAs, one H125, five MD 500s, and four Bell 206/206Ls.

"Peter was really instrumental in introducing the AStars to the market in north Vancouver Island as well as the mid coast of B.C.," said Eissfeldt.

The AStars are generally used for servicing heli-fishing resorts in the summer, and heliskiing work in the winter. Much of the former take place at the famed luxury Nimmo Bay Wilderness Resort in the middle of the Great Bear Rainforest on the mainland, while the latter is focused a little further up the coast in the mountains around Bella Coola through a partnership with Bella Coola Heli Sports. Throughout the year, the aircraft also perform various utility roles at the bases as required, including firefighting.

The MD 500s typically take on logging camp support work, such as flying fallers and other forestry workers in and out. More specialized operations include slinging loads of shake blocks, and tree topping, which involves flying a giant saw underneath the aircraft to remove the tops of trees on the edge of logging areas that have been newly exposed to the elements.

The 206 fleet is used for various other duties, including some logging camp and engineering support. They are also occasionally used for fire suppression work, where they perform supervision flights for fire bosses, or to provide infrared scanning to show hotspots.

"I think diversity is the key to being successful and healthy," said Eissfeldt. "If you end up just in the oil patch or mining and it goes down — which it always will, as we see now — so does your revenue." The company is also keen not to rely on firefighting to pay the bills, treating such work as a bonus when it arrives.

"We feel if we can't support ourselves with normal planned or scheduled ad hoc revenue then we have to make some changes," said Eissfeldt.

One of the West Coast Helicopters' lower-profile operations is servicing First Nations villages with medical practitioners, but it's something it has done for many years. "Although it's not a huge source of revenue, it's part of a foundation of building relationships — and that's what we're about," said Eissfeldt. "Anybody can work on or fly a helicopter. . . . The important thing is how you relate to people, how much of a priority you place in that relationship. We really believe in that."

A CHALLENGING FLYING ENVIRONMENT

Work in the West Coast is often far from straightforward. "It's a very challenging and dynamic environment — both in the weather and the type of work that we do," said Clayton Spizawka, West Coast Helicopters' chief pilot. "We have confined area operations, long line mountain flying, and then throw the weather in there... it can be difficult."

The winter can bring storms from the Pacific, winds from the southeast and mechanical turbulence; while the summer sees fog become a regular challenge. "You have clients that want to start work at 8 o' clock in the morning, and you might not be able to see across the airport until 11," said Spizawka.



























New forestry sites often present the challenge of landing at unprepared sites, while working out of a camp involves using a long line that's a minimum of 200 feet long.

"Flying an aircraft is challenging as it is, never mind having something hanging 200 feet below you that you're trying to put in a two-foot box, or a thread down through the trees," said Spizawka.

About 50 percent of the Port McNeill base's work involves mountain flying, with a good deal of work along the central coast of mainland British Columbia, due to the lack of road access to much of it.

The existence of predatory wildlife (predominantly black and grizzly bears) in this part of the world adds a further consideration when landing at remote sites. West Coast Helicopters' pilots complete training courses to understand the best course of action should they encounter these wild animals.

"There can be conflict, but we always have and always will strive to reduce any impact on the local wildlife," said Spizawka. "Most of the time any conflict can be resolved by separation, and if that's not the resolution, then bear spray is the next step. I've spent a lot of time in the coastal river watersheds and I've had lots of encounters with bears, but they've always been able to be resolved peacefully."

West Coast Helicopters' facility in Port McNeill has expanded considerably from the original hangar, with that hangar's offices converted into six bedrooms for non-local staff to use when they're in town on rotation. Another room contains an on-site gym.

All this effort is to provide the best possible working environment — and draw — to pilots and maintenance technicians at a time when the industry is seeing a shortage of experienced personnel. "We deal with the same shortage of personnel that the whole

industry is seeing," said Laine Valentine, West Coast Helicopters' operations manager and base manager at Campbell River. "Getting qualified pilots and engineers to move to northern Vancouver Island or one of our bases is always a challenge." Part of the answer is in providing a working environment that people want to join, he added.

"We had a lot of pool people coming in, so we provide a living space for them, and a gym, because there's nothing available in town," he said. "So, we just try to care for the needs of the people that are coming in to work."

Another part of the solution is investing in low-time pilots by putting them through a mentorship program with senior pilots to ensure the company maintains a pipeline of staff for the future.

"We build them how we want them, and still maintain customer confidence in placing those individuals in a role where they're set up for success," said Spizawka. These pilots can build flight time by performing track and balance or test flights following maintenance, or through repositioning flights to move aircraft between bases. Then they can take on some of the less challenging operations, such as "pad to pad" crew change flights to remote sites for forestry workers. New type endorsements or additional training are also offered to staff to help them continue to grow.

"If you take good care of your employees, they are going to work hard for you," said Spizawka. "Our typical clients don't even know the management — it's the pilots that are the frontline of the company and the face of the company the majority of the time. And so you have to make sure that you have people representing you the way you want to be represented."

A DEVELOPING REPUTATION FOR MRO

The company's chief engineer, Richard Kmiec, is based at the Nanaimo facility. He said it's the West Coast's rain — rather than operating over saltwater on the coast — that has the largest impact on typical maintenance activity.

"The thing that is affected most by the rain are our main rotor blades," he said. "They're subject to a lot of erosion just by hitting the rain at close to the speed of sound as they're rotating. As far as corrosion is concerned, surprisingly we don't have to deal with that a whole lot because of the weather not being extremely hot, even though we're right by the saltwater."

West Coast Helicopters is one of very few operators in Canada to be certified by the European Aviation Safety Agency, allowing it to sell parts and services to international third party customers. It works on aircraft both larger and smaller than its own fleet of light and intermediate helicopters, servicing aircraft ranging from the Robinson R22 to the Bell 212.

The company has third-party maintenance provisions at Nanaimo, with a paint shop and a Robinson Service Center at that location. Despite not operating a Robinson aircraft in its fleet, West Coast Helicopters chose to become a service center for the manufacturer following a request from a customer to maintain their R44. Third-party Robinson work has grown by word of mouth since then.

The company initially established its paint shop to work on its own aircraft, but it has been kept increasingly busy performing third-party work, again driven by word-of-mouth. Highland Helicopters and VIH are both customers.

"It's a small industry, and people hear about it and want to try us out," said Kmiec. "So, it's worked out well."

One of the longest-tenured employees at the company having joined in its first few years, Kmiec said the maintenance side of the house has seen only a small amount of staff turnover.

"We've had the same crew for many years," he said. "We've hired a few people more recently in the last couple of years, but the rest of the guys that are with us have been with us for many years."

The longevity of many of the staff at West Coast Helicopters is perhaps explained

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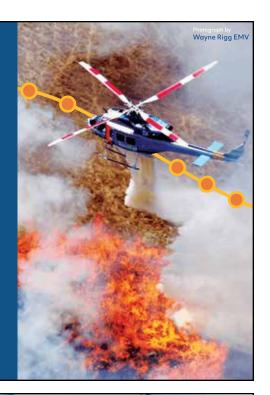


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by the importance placed on good working relations by the company's management.

"We treat our crews the way that we want to be treated," said Eissfeldt. "We really believe in a great working environment, and with that, our people will want to do the best they can — and that translates to our customers."

Part of creating the best working environment possible is in understanding the various personalities and character traits within the company, said Eissfeldt. "We've gone so far as to provide an



in-house character analysis for people, using what's called the DISC model," he said. For example, some people have more of a dominant personality, others are more prominent in the "conscientious" area, while others might be more relationally-inclined.

"It's an awareness tool, where not only are you more aware of yourself, but you're aware of how to relate to other character types and personalities," said Eissfeldt. "It's certainly helped over the years in communications, and helps create much more of a safe working atmosphere."





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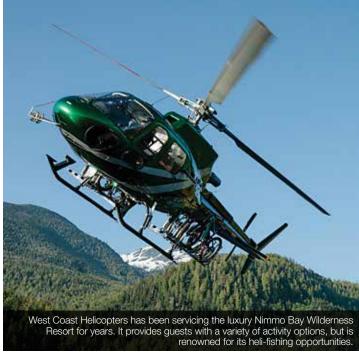
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West Coast Helicopters has also been extremely proactive with its safety initiatives, winning awards from the British Columbia Aviation Council for its work in this area. Led by aviation safety officer Doug Strachan, it has had a safety management system (SMS) for over 15 years, and has been asked to give seminars to Transport Canada and the Federal Aviation Administration on the SMS programs it has implemented.

"We've seen huge areas of improvement and benefits to the company because of our SMS," said Eissfeldt. "That's by paying attention to the little things, identifying the hazards before they become incidents and accidents. And that's a culture that we've been grooming and our guys and girls are doing it."

CONTINUING TO GROW

In terms of future growth, West Coast Helicopters is firstly looking to become more profitable in the areas it's already operating in. "We'll look at how to make it more efficient, how to be better at what we do," said Eissfeldt. "I don't believe there's anybody that can't improve what they already do."

Third-party maintenance promises a major area of growth, and this will be focused in Nanaimo. "With the disparity in the U.S. dollar and the Canadian dollar, it's a great opportunity to advertise south of the border, and encourage third party activity that way," said Eissfeldt. "Reputation is a big deal and we've spent quite a few years making sure we have the right reputation — one that is founded on safety, service and reliability."

Operationally, the company is looking at opportunities in training mountain flying techniques from its base in Bella Coola, and is considering some new products to service the tourism market, such as cultural tours with first nations communities.

With Barratt having retired in November 2018, Eissfeldt is now the sole founder remaining from the trio that established West Coast Helicopters with two leased aircraft on the side of a remote airport in 1993. Through hard work, a focus on building good relationships, and a forward-thinking safety philosophy, the company has gone from strength to strength. And having established such a solid foundation, it seems well set to begin its next chapter of operations at the frontier of the wild.







DOWNLOAD THE WALLPAPER!

While the industry downturn slowed sales of new aircraft, savvy operators have found economic opportunities in the used aircraft market.

BY HOWARD SLUTSKEN

If you're thinking of buying or selling a used helicopter, this might actually be a good time to do so. Maybe we're finally getting past our focus on the doldrums in the oil-and-gas sector, or it could be that the replacement cycle is catching up with older helicopters,

with operators making the decision to upgrade their fleets. The helicopter market has always been very cyclical, and the

perceived strength of the marketplace will often depend on the specific needs of a region — and the opinion of who you talk to.

"The trend we're seeing in Canada is for hydroelectric powerline work, whether patrol or working on the towers, they're going with Cat A twin-engine aircraft," said Steve Dettwiler, president of Maple Leaf Helicopters Canada, a brokerage service based in British Columbia. "Some operators are using the MD 902 Explorer, others the [Airbus] EC135. There are lots of [Airbus AS350] AStars available, but for Cat A [performance requirements], you'd have to go

with an [Airbus] AS355NP TwinStar.

"We're seeing the Bell LongRangers being sold off and replaced by the AS350 B2 and B3 series," Dettwiler continued. "When it comes to the B3e [H125], most Canadian operators are interested in the ones that have dual hydraulics. For forest service work, there's the inclination to go to twin-engine on the Bell mediums." Airbus machines are certainly in demand, and it might be a better

financial and operational decision to search the used market rather than buy new, according to Jason Kmiecik, president of Helivalue\$, producers of The Official Helicopter Blue Book.

"The lights twins - EC135s, 145s - there's a big market for those," he said. "In the U.S., Metro Aviation and Air Methods have pretty much grabbed everything [in terms of those types] that was for sale or is about to come online for sale. In today's market, you could buy two used aircraft, fully retrofit them with brand new interiors and avionics in both aircraft, and you're at about the price of one brand new aircraft.

"There are plenty of transactions happening on those aircraft all over the place," Kmiecik continued. "Some of them have actually started going up in value - the AStars and some of the newer 407s — because there's just starting to not be that many out there

for sale."





FINDING A DEAL

But, as with any marketplace, there are bargains to be found. "There are some really good deals out there," said Dettwiler. "As an example, we've got a Bell 212 for sale for \$1.5 million, which is a good price for a 212. [The market] does go in cycles. Right now there are a lot of aircraft available for sale, which drives the prices down. You can get into a nice little JetRanger probably for \$350,000 to \$400,000."

There's also a bit of an underground marketplace where transactions happen quietly, with a handshake, explains Kmiecik.

"You'll see the sales happen," he said. "They were never listed online. They sell to the operator next door or somebody's buddy. The smaller, cheaper aircraft are garage transactions."

And speaking of those smaller machines, Kmiecik believes that the operators who still love Schweizer helicopters are going to be happy with the company's new owners, Schweizer RSG.

"Their plans are to go full production again," he said. "So I think there's going to be a comeback of Schweizer."

While Kevin Mawhinney, helicopter technical advisor at Jet Support Services, Inc. (JSSI), doesn't think much has changed in "the day-to-day, ins-and-outs of the industry," he does see a trend developing in the "larger-medium" sector.



"I think you're going to see more people move into this segment with machines that fill that niche," he said. "For example, the [Leonardo] AW139 has really filled a need, and we're seeing a lot of interest in it."

He points to the multi-role capability of the AW139 as being a driver for new operators. "I think it fills a niche that no other machine was filling before."

SUPER PUMAS AIRBORNE AGAIN

And what about all of those Airbus H225 Super Pumas that have been languishing on helipads around the world? They're now in demand, according to Kmiecik — but for utility work, not offshore. "What we're seeing now is supply is actually shrinking," he said. "Aircraft that were once for sale are now pulled off the market and are back to work with the original lessees or new people."

With the shift in deployment of Super Pumas from offshore work to utility missions, Kmiecik said that there's a bottleneck getting the parts that operators need to change the primary mission of their helicopters.

"The 225 is becoming the utility machine, the go-to machine now," he said. "The problem is the supply of utility parts with Airbus — cargo hooks and stuff like that. They can't get them in stock fast enough to ship out to the people who need them. There's aircraft waiting on the ground right now for parts so they can get out on a contract."

Kmiecik said that some operators have recognized the value in the 225 and have focused their acquisition strategy on the type. "It's a lot of aircraft with a lot of lifting for the price."

Dettwiler also knows of companies that targeted an opportunity by buying up inventory of specific types. "We sold 14 SA 315B Lamas in the past few years to a company in Scandinavia, who's basically stockpiling all the Lama inventory from around the world and supporting the existing Lama operators. But it's going to come to an end. Airbus would prefer to sell the H125/AS350 B3e," he said.

OPERATING COSTS

Brandon Battles, vice president, Conklin & de Decker, has been researching and analyzing helicopter operating costs for over 30 years. With his years of experience, Battles has seen the cyclical changes that the industry has faced.

"I think we've all seen it through our careers — oil-and-gas is bad right now, but another operation that uses helicopters might be very strong," he said. "The firefighting folks are probably having some pretty good years, from a business point-of-view.

"I'm noticing now that it's not just the acquisition cost that's important anymore, it's also those operational costs that they'll be encountering over the long ownership of that aircraft," he added. Kmiecik echoes that thought.

"Pretty much everybody's complaint is to try to get operational costs cheaper for these aircraft, especially for the S-92," he said. "It's a very expensive aircraft to operate, and with what they're making each month on their contracts, it's getting very tight to be able to make a profit at all on them."

While some of the focus on operational costs may be driven by corporate acquisitions and industry consolidation, Battles believes that operators at all levels have become more attuned to the business side of the equation, in some ways resulting from the economic downturn of 2008.

He said that operators may have planned to acquire a helicopter and keep it for perhaps 10 years. After that, they may look to sell it to avoid major inspections or the required replacement of







life-limited items or other significant maintenance.

"They had a plan but when the economy changes and they can't sell the aircraft for as much as they planned, now they must continue to operate it and wrestle with some of the higher costs that are associated with an older aircraft," said Battles. "Maybe because of that experience, people are considering the maintenance and operating costs more than they used to."

WHAT'S NEXT?

Kmiecik's analysis of the super-medium market suggests that machines like the Airbus H175, Leonardo AW189 and the upcom-

ing Bell 525 are going to face challenges in making an impact on the market.

"In general, the super-mediums haven't lived up to expectations that everybody thought was going to happen," he explained. "And that's because the S-92 has dropped in value, so where it's actually cheaper to rent a S-92 than it is to buy a brand new super medium.

"Capital is drying up in the space," Kmiecik continued.
"There's not many people that are willing to go out and buy a \$15- to \$35-million helicopter anymore for offshore when we've got so much supply still in the market right now that is sitting idle for sale."

And Kmiecik is pretty blunt in his assessment of what needs to happen in the oil sector to ensure that helicopter operators can continue to provide service.

"I think over the next six months to a year, you're probably going to see some change in the attitude of the oil companies," he said. "There has to be a change because they're forcing everybody into bankruptcy. I think that people are now telling them 'no' on certain requirements that they're setting on tenders, like age requirements for aircraft. I think that they're going to have no choice but to start helping out the people who are keeping them in business."



Howard Slutsken | Howard Slutsken's lifelong passion for aviation began when he was a kid, watching TCA Super Connies, Viscounts, and early jets at Montreal's Dorval Airport. He's a pilot who loves to fly gliders and pretty much anything else with wings. Howard is based in Vancouver, B.C.



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Good training is the foundation upon which successful careers are built, and it's what allows the industry to continue to grow and improve. Because of this, the schools that provide flight training play a crucial role in shaping the industry's future — and it's why they should also be held to the highest standard. For Bob Caldwell, president and CEO of International Defense & Aerospace Group (IDAG), the gold standard of flight training was U.S. Aviation Training Solutions (USATS) — formerly known as the Bristow Academy.

A few years ago, Caldwell and IDAG were looking to establish a flight training school in the U.S. that had the ability to train foreign military students, but "we didn't see how we could compete with the legacy, and the legend, of Bristow Academy, which became USATS," he said. Fast forward to late 2018 when USATS was put up for sale, and IDAG made the decision to buy it. The transaction was officially concluded on March 4, 2019, and the flight school — headquartered in Titusville, Florida — became part of the IDAG group.

"All of the things that made [USATS/Bristow] the gold standard in the industry were still in place," said Caldwell. "The people, the equipment, and the unwavering commitment to a safety culture — everything that made Bristow the best helicopter flight school in the world was still there. So, we stepped into this with both feet; it was a home run for us."





Originally founded in 1987 as Helicopter Adventures Inc., the flight school was acquired by Bristow Group in 2007 and renamed the Bristow Academy. It was then purchased in late 2017 by a group of investors who orchestrated the name change to USATS.

Now that USATS has been acquired by IDAG, Caldwell said the group wants to ensure the school's name and reputation resonate with pilots like it did during its Bristow Academy days.

"Bristow was building a worldwide pilot network," he said. "They had a significant need at the time — before the oil-and-gas market downturn — and they were trying to build an in-house pool of pilots for themselves."

IDAG is looking to capitalize on the experience of its staff to provide training not only to helicopter offshore operators, but also to civilian, military, public and parapublic organizations.

PROGRAMS OF PLENTY

USATS is positioning itself to return to its former government, law enforcement, and oil-and-gas customers, and to also seek new ones. But a big focus for the flight school is its military training.

"We're expanding our military training programs," said Emily Nack, director of business development at USATS. "We've been working on these programs for over a year now. Since 2003, we've been doing military training, but we have to diversify to satisfy the expanding needs of our customer base. Right now, under the direction of the new ownership, we've expanded the aperture and gone to former military and government customers to let them know that our programs are something that we are pursuing with vigor."

With a reputation for quality going back to the school's beginning, shifting its focus back to military training was an easy choice.

"The beauty of this, when we're circling the business model back, is a large portion of our former students are now in senior leadership positions within these governments – so they know the quality of the school," said Randy Nash, director of maintenance. "They know everything about the program because it produced them. They might be a lieutenant colonel, or even a general in their respective commands, but they started here."





The military training program at USATS was developed in 2003, when the flight school was known as Helicopter Adventures. With the goal of training and qualifying pilots, the school developed the initial entry rotary-wing (IERW) program with the Schweizer (now Schweizer RSG) S-300.

USATS's lead military instructor, Jose Revilla, said the program is around seven-and-a-half to eight-and-a-half months, and, although it varies, students accumulate roughly 160 flight hours by the end of the program -137 hours in the aircraft and 23 in the flight simulator.

Following the development of the IERW pilot program, USATS expanded into intermediate, or what the flight school used to call mission-oriented, courses.

Now offering ab initio as well as intermediate and advanced flight training programs on both fixed- and rotary-wing platforms, USATS's programs blend practices from commercial and military sectors. The school has U.S. Department of State approval to offer courses on night vision goggles (NVGs) for a pilot in command or instructor, high altitude flight for a pilot in command or instructor, instrument flight rules (IFR), Bambi Bucket and sling load operations, search-and-rescue (SAR), and HAZMAT and emergency procedures training. USATS also offers a deck landings course at a facility owned by Acadiana Regional Airport in New Iberia, Louisiana.

"I was in charge of the training standardization department, so I had the opportunity to finish a process of four years to develop our flight training manual," said Revilla. "It took around 6,300 hours of work and we were able to review all of the training approaches and procedures and try to figure out the best practices.

"We try to fill some gaps like the lack of coordination [and] synchronization between when you deliver the theory with the practical; we're developing the kind of appendixes to link both parts in the right way in order to get a better product."

Further broadening its scope, USATS has also established a comprehensive fixed-wing program.

"Our fixed-wing programs and rotor- to fixed-wing airline pilot preparation programs are indicative of the new approach," Caldwell told Vertical. "We have partnered with highly respected Sky4U in Germany to create a global pilot training alliance that will give USATS's pilots a career path towards a job in the airline industry. So, we're evolving without forgetting what got us here."

But the programs at USATS aren't just geared towards pilot training — the school also offers embedded maintenance training. In addition, USATS has a dedicated Federal Aviation Regulation (FAR) part 145 maintenance facility at its Titusville location.

The students that train with USATS range from those that selfpay to those who arrive through foreign militaries or parapublic agencies. In the last 10 years alone, the flight school has trained over 1,000 military students and over 3,000 commercial pilots.

While a majority of the school's military and paramilitary students have traditionally been situated in Central and Latin American countries, USATS is now focusing on Central and Eastern Europe and other locations around the word. The flight school, through parent company IDAG and its partners, is opening programs in several locations around the world.

"There is an ongoing project in Slovakia where IDAG and USATS



the Schweizer S-300 is "the best training aircraft in the world." USATS has ordered 25 S-300s from Schweizer RSG



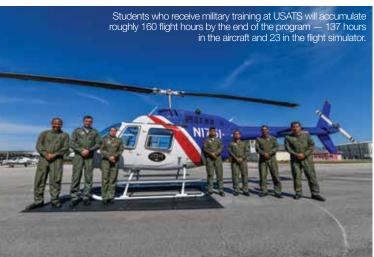














support our sister company CSG — one of the largest defense industry providers in the region — to train military pilots and maintenance crews on S-300, MD 500 and [Sikorsky] UH-60A [aircraft]," Caldwell said, adding that USATS also has customers in the Middle East and Asia, as well as a presence in North Africa.

THE TALENT

Employing both civilian and former military instructors and maintenance personnel, Caldwell believes "it's the people that make USATS the best."

Nash added: "When you have an aspiring pilot come in, they want to talk about a career [and] what our cadre does. You can talk to any one of the people here and they've got real-world experience. So, it's not just, 'I teach you to fly.' It's, 'I also mentor you on [a] career.' "

Along with the school's Federal Aviation Administration (FAA)-certified flight instructors (CFIs), some of USATS's instructors are European Union Aviation Safety Agency (EASA) flight instructors, which allows the flight school to be more flexible with training programs.

"We have a course that integrates both EASA and FAA [certifications] into one course," said Nack. "You've got students from different countries, some doing the FAA course, some





"When you have an aspiring pilot come in, they want to talk about a career [and] what our cadre does. You can talk to any one of the people here and they've got real-world experience. So, it's not just, 'I teach you to fly.' It's, 'I also mentor you on [a] career.'"



doing EASA —or both — and it's taught in tandem."

The years of combined experience among the instructors lend well to USATS's focus on safety. "Doing things properly is still the main focus," said Revilla. "The experience that everyone has, we all contribute with the main focus on safety — that's what I like about it. We're not just giving the minimums, we're giving the proper education, and with the knowledge of different people."

USATS's safety-oriented programs also utilize FAA part 141 approval on the helicopter side, meaning students are required to pass "stage checks" as a sub-part of each block of training, which allows instructors to objectively check each student's prog-

ress. (The school is also in the process of finishing its fixed-wing part 141 approval.)

The flight school's instructors use a progressive training approach that values the concept of, "What you learn first, you learn best." Students spend the first week of courses in the class-room learning concepts like in-air threat management and the basic principles of flying. "That's introduced very early, because then everything builds on that," said Nack.

Following the classroom phase, students are flying in the second week of training, receiving the opportunity to apply the principles they learn in the cockpit.

"At the end of that course, you've got not just a pilot who can fly, you have a professional," Nack added. "You have somebody who's going to be able to respond when they get into a complex aircraft in these high-risk environments."

GROWING THE FLEET

USATS operates a large fleet of aircraft across its U.S. and European locations, including Robinson R22s and R44s, Bell 206 JetRangers, S-300CBis, Sikorsky UH-60 Black Hawks, MD 500s and MD 530s, as well as Cessna 172s and Diamond DA42s on the fixed-wing side.

Caldwell said USATS is planning to add MD 500Es to its fleet in the near future. "We're working closely with MD Helicopters to develop a special flight training program for the 500 series and



the MD 902 at USATS."

Looking at the UH-60, IDAG currently has nine of the type in its fleet, with a handful deployed to Europe and a few of the aircraft in Slovakia for UH-60 transition training with USATS — otherwise known as the aircraft qualifications course (AQC). "[For example], you get an S-70 type rating in a Black Hawk — that's essentially what we're doing with the AQC. It's a restricted category aircraft, but you do a qualification course in it," Caldwell explained.

The majority of USATS's rotary-wing fleet is comprised of the S-300CBi, of which USATS currently has 28. While the flight school has committed to the S-300 as its primary training aircraft, it recently announced an order for 25 of the new S-300 type from Schweizer RSG.

"The 300 has really been the standard-bearer for primary flight training for better than 50 years," said Caldwell. "I learned on the [Hughes] TH-55 [now the S-300], as well as the tens of thousands of other army aviators who learned on the TH-55. We've got a lot of experience with the 300s.

"It's a very forgiving aircraft. You take these primary flight students and they bounce the aircraft around a lot, and some of the other aircraft out there are much, much less durable. The S-300 is still the best training aircraft in the world," he added.

The timeline for the first delivery of the new S-300 fleet is still under discussion, but Caldwell said it is likely to begin in the fourth quarter of 2020.

The flight school has been operating the S-300 for over 25 years, starting when the school was under the Helicopter Adventures name. "We're the ones making the investment in the aircraft," said Caldwell. "We operate the aircraft here in the [United] States, we operate them in Hungary, and we operate them in Slovakia. So, we're committed to the airframe."

Among USATS's current fleet of 28 S-300s, 10 aircraft are equipped for IFR training, with the rest being primarily visual flight rules (VFR)-compatible. Six aircraft are also equipped for NVG training. With the majority of the current S-300 fleet being analog, Kevin Luby, USATS president, told *Vertical* the flight school is interested in glass cockpits for the new S-300 fleet, and is also looking to retrofit the current fleet.

BRINGING IT ALL

USATS is a one-stop-shop when it comes to training, infrastructure and certifications. The flight school has the ability to issue both FAA and EASA certificates on the rotary-wing side, and can issue FAA certificates on the fixed-wing side. Caldwell said USATS











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"If [a student] comes internationally... we build a world pilot with certifications we can give them in EASA and FAA licenses," said Nash. "There are very few schools in the world that can give you a world pilot."

In order to make the training process easier for international students, USATS also has approval to grant visas for students who want to train at the school.

Regarding student funding, Luby added that USATS is looking to pursue reaccreditation, either through an accreditation board as a vocational school, or through an affiliation with a university to qualify for federal student loans and aid.

Another benefit of training at the flight school is its Florida headquarters.

"It's Florida," said Caldwell. "It's a beautiful place to train . . . [and] we don't have weather issues. We have better than 300 days of flying a year."

Looking to the future, USATS currently has a 50-acre parcel of land that it is preparing to set up as a military operations and urban training site. The goal is to provide airborne law enforcement officers training to use their mission equipment, refine aircrew coordination, and develop better air-toground surveillance as well as search-andrescue and apprehension tactics. Luby said the property has a diverse array of geography and touches the St. Johns River, which makes for good training opportunities.

"We're developing a POI [program of instruction] around this training," Caldwell added. "So, I have structures and vehicles out there along with some different geographical landmarks, like fences or tree lines, to navigate the ground officers or the SWAT teams from the helicopter. The goal is to make it a certified site, and then we'll be eligible for state funding, [meaning] the state will reimburse the local law enforcement agencies who use our facility."



The flight school's instructors use a progressive training approach that values the concept of, "What you learn first, you learn best."





and offers embedded maintenance training.

Combining the numerous solid attributes that the school has spent over 30 years building, USATS is well-positioned for a bright future in the world of flight training.

"You spend a day [at USATS], and you see the quality of the operation, you see the quality of the equipment and you see the quality of the people," Caldwell said. "Every aspect of the business is professional. [The instructors] all have real-world experience. They've gone out, they've flown offshore, they've flown EMS [emergency medical services], and they've been test pilots.

"Everybody in our organization, including Kevin [Luby] and myself, we're aviators. This is what we do and this is what we've always done. This is our passion. So, we want to bring the best of everything to USATS. And that's why we bought it. Because Bristow Academy always was, and USATS continues to be, the gold standard." •



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.





VerticalRewind

The Spraving Pionee

written by Bob Petite



POULINING

Herman Poulin's Central Aircraft introduced helicopters to agricultural operations, and helped develop the industry across the Pacific Northwest.

The early development of the helicopter industry on the West Coast owes much to one of the lesser-known industry pioneers, Herman A. Poulin. His company, Central Aircraft, based in Yakima Valley, Washington, introduced helicopters to agricultural operations, and was also one of the first to operate the machines in the mountains.

Poulin's interest in aviation can be traced back to his early childhood. As a young man, he obtained his pilot's license and became an accomplished aviator and instructor, eventually specializing in crop-dusting with fixed-wing aircraft.

In 1939, Al Baxter, a young pilot and entrepreneur, started Central Airways — a crop-dusting business — in Yakima Valley. At that time, Yakima County was the fourth richest agricultural area in the United States. The company quickly grew to operate 50 Stearman Model 75 and 12 Waco 10 aircraft, later purchasing a surplus Boeing B-17 bomber. Central Airways was renamed Central Aircraft Inc., with Poulin appointed president and Baxter as secretary-treasurer. It flourished into the mid-1940s with successful spraying and dusting programs.

Over in Niagara Falls, New York, Bell Aircraft Corp. had entered into helicopter development at the end of the Second World War in 1945. With the success of his experimental Model 30, president Larry Bell was considering a new post-war industry — the commercial use of helicopters. He had 11 pre-production Model 47 helicopters manufactured for training and experimental work between 1945 and 1946, with plans to build 500 production versions. Soon, he was considering new types of work for his helicopters — including spraying and dusting crops and orchards.

Bell contacted Central Aircraft in Yakima to suggest using the helicopter for experimental dusting and spraying trials during the summer of 1946. Poulin was enthusiastic, welcoming the opportunity to use a helicopter in this new type of aerial operation.

Poulin was trained to fly helicopters by Bell test pilots, including chief pilot Floyd Carlson, before Bell started instructing at its new helicopter pilot school in Niagara Falls.

A pre-production Bell Model 47 was shipped to Yakima Washington in June 1946, and experimental flying started across the farming area. Frank H. (Bud) Kelley Jr., assistant to the president of Bell Aircraft, supervised helicopter operations, and mechanic Joe Beebe oversaw maintenance and mechanic training. Poulin was the main pilot for the Bell 47 helicopter and Central Aircraft's Joe Scaman was the insecticide specialist.

"Besides its ability to fly at any speed and to back into tight corners for specialized dusting jobs, the helicopter is more effective in straight dusting or spraying because the strong downwash drives the insecticide into the foliage, reaching every bud and leaf," Kelley said.

Farm owners and operators of fixed-wing aircraft were keenly interested and, overall, flight tests with the Bell 47 were successful during the summer months. The work was completed in cooperation with recognized leaders of agricultural aviation and other specialists, and the helicopter dusted hundreds of acres of orchards, trellis and flat crops. Poulin did most of the flying, to determine the best speeds and altitudes for coverage and control. Even with light loads, the helicopter covered 20 acres in about 17 minutes, applying 50 pounds (22 kilograms) of treatment per acre.

"I'm satisfied that the helicopter will, in the near future, replace most fixed-wing airplanes for pest control," Poulin said. "Its variable forward





speeds and air effect make it possible to obtain the desired flow of materials for the particular result more effectively. Longer hours will be made possible. In addition, long ferry flights from landing strips will be eliminated. I believe these advantages will make it possible for one helicopter to do the work of at least two conventional aircraft."

Central Aircraft ordered nine Bell 47s to start a pilot training school for crop dusting, spraying, and other agricultural uses, as well as for special projects that included snow surveys, timber cruising and fish stocking.

Meanwhile, Tommy Hall, future chief rotary-wing pilot at Central Aircraft, attended Bell's fourth pilot training school class, graduating in 1946. His unique skills were passed to many students in the following months across the Yakima farming area.

Bell awarded Central Aircraft the first-ever helicopter dealership in the spring of 1947, covering the states of Washington and Oregon. This contract authorized the company to sell new Bell 47 helicopters, supplies and parts, and to provide repair and maintenance services.

Central Aircraft received the first Bell 47B cabin-type wheel-equipped helicopters, shipped by boxcar from Bell, in early 1947. Poulin and Hall flew demonstrations for interested farmers and dignitaries at the Yakima Airport. One interested party was the Bonneville Power Administration, who then hired Central for a three-month experimental helicopter patrol of 2,500 miles (4,023 kilometers) of powerlines in Washington, Oregon and Idaho. The future looked bright for Central Aircraft.

BUILDING A TRAINING PROGRAM

U.S. government-approved helicopter pilot and mechanics maintenance courses were soon underway at the Yakima Airport, under chief pilot Hall, with Beebe as instructor for maintaining the rotary-wing aircraft. Flight training, helicopter mechanics and crop-dusting courses were offered at a cost of \$1,500 for 20 hours of helicopter flight





instruction, plus ground school.

Angus McArthur, Vern Montgomery, Carl Brady and Kermit Jones were some of the pilots trained, and mechanics included John Brink, Stan Hellwick, Bill Brown, Danny Grecco and Wayne Cooper.

A magazine color photo of Herman Poulin flying the experimenta pre-production agricultural Bell Model 47 helicopter in 1946.

In the early spring, the U.S. Geological Survey department used a Bell 47B on floats for experimental snow surveys on the eastern slope of Cascade Mountain. The program was completed in record time using one geological engineer, compared to the previous need to have more than a dozen men on skis for over a week.

Central Aircraft received two more Bell 47B helicopters in late April, and set up headquarters in Seattle, Washington, to carry out training using its float-equipped Bell 47B. Then, in early May, Central ferried a Bell 47B on floats to Vancouver, British Columbia, to participate in the search for a missing Trans Canada Airlines Lodestar airliner that had crashed while landing in Vancouver. However, the crash site was not located and the remains of the aircraft were only discovered 47 years later on the North Shore Mountains, near Vancouver.

Central Aircraft suffered its own disastrous crash on May 7, 1947, when pilot Angus McArthur lost control while attempting an autorotation during a landing on Lake Union, near Seattle. McArthur and his passenger were both killed in the accident.

Two months later, Central Aircraft received three new agricultural open-cockpit two-place crop dusting helicopters from Bell.

Also that spring, Okanagan Air Services pilot Carl Agar and engineer/mechanic Alf Stringer arrived in Yakima from Penticton, British Columbia, for training on the Bell 47. Okanagan Air Services purchased one of Central's Bell 47B-3 helicopters, and Agar flew back to British Columbia on Aug. 9, 1947, after he completed his flight training. In mid-August, Brady and Montgomery ferried a Bell 47B to Vancouver Island, where it was used in an attempt to recover the body of a mountain climber trapped at 4,000 feet (1,220 meters) on



the Tiedman Glacier, Mt. Waddington. However, mountain flying techniques hadn't been developed and the terrain prevented the helicopter from being used successfully to retrieve the body.

By the end of 1947, Central's pest control program recorded almost 500 flight hours of dusting and spraying through two aircraft. Work was completed on high crops, orchards and hops and the helicopters registered almost 100 percent control.

Central Aircraft continued its successful pilot training course in 1948, along with the dusting and spraying program. Hall ran the pilot training program, while Brady, a Civil Aviation Authority (CAA) examiner, started a flight training school in San Mateo, California, and graduated about 15 students. He later set up a school in the Seattle area, where he trained Nancy Livingston to fly (she was the first woman on the West Coast to receive a commercial helicopter rating).

Central Aircraft was successful in a follow-up contract for the Bonneville Power Administration, patrolling 3,000 miles (4,830 kilometers) of powerlines by helicopter in the Pacific Northwest. The power company purchased its own helicopter fleet for patrol and specialized work, and it continues to use helicopters to this day.

In 1948, Poulin supplied two helicopters and crews to the U.S. Geological Survey for a mapping survey program. When he won the contract, he had two helicopters, but just one pilot available for the job. Around the same time, Brady started his own commercial helicopter company, Economy Pest Control, with two entomologists as partners - Joe Scaman and Don Larson.

Brady agreed to fly one of the helicopters in Alaska and leased it from Central Aircraft, receiving half the revenue from the job. The aircraft had been modified with an open cockpit bubble enclosure, while the other Bell 47B cabin remained unchanged. Both helicopters were broken down and loaded into a Pan American DC-4 at the Boeing Field in Seattle for transport to Juneau, Alaska.

The job location was near Pelican and Fairbanks in northeast Alaska. The program involved flying surveyors and instruments to the tops of mountains, where they made observations related to basic triangulations for mapping purposes. It was ideal work for the helicopter.

Brady reported landing on seven mountaintops numerous times in one day, at altitudes averaging 4,000 to 5,000 feet (1,220 to 1,525 meters). Over 28 days, Brady recorded 260 mountain landings and flew 142 hours, with two forced landings due to fan belts breaking, and one because of carburetor icing. Thanks to the helicopter, work was completed in one day that normally would have taken a month if survey crews had to walk and climb on foot.

During this time, Brady came up with the idea of attaching two-byfours between the wheels on both sides of the helicopter, to prevent sinking in soft ground conditions when landing on mountainous terrain.

Meanwhile, Hall removed the cabin enclosure on the Bell 47B flights during the summer. The view was excellent, but there was an obvious problem when it rained. Project engineers were ecstatic about using this new type of aviation for personnel transport, until the helicopter was damaged when landing in a muskeg area near the end of the contract. It was abandoned over the winter and later rebuilt to fly again.

Overall, the first geological survey using helicopters in Alaska was an outstanding success and led to additional contracts in 1949 for several commercial companies. Brady concentrated on expanding his own company, Economy Pest Control, and purchased Bell Model 47Ds for use in Alaska.

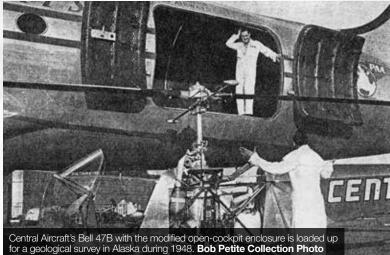
A CHALLENGING TIME

Another important job for Central during 1948 was one of the first firefighting contracts with the U.S. Forest Service in Northern California. Armstrong-Flint Helicopters was awarded the original contract, but lost their Bell Model 47B in an accident — and Poulin agreed to supply





aircraft were sold to Wala Helicopters in Washington State. Dan Jones Photo



A Central Aircraft Bell 47B on floats in Vancouver, British Columbia, during 1947. **Gordon Peters Photo**

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a Bell 47B-3 to complete the job.

Pioneering helicopter pilot Hal Symes and mechanic Danny Grecco flew the contract starting in August. Symes had been recently hired by Poulin to fly dusting and spraying operations, after he spent over a year in Argentina dusting locusts with Bell Aircraft for the Argentine government.

Symes flew more than 125 hours in his first month, moving firefighters to numerous fire sites, landing on ridge tops to drop off men. However, the high altitudes were challenging for the under-powered helicopter.

He spent his time picking up firefighters

after they fought the wildfires, carrying out surveys to locate potential sites for landing pads and other specialized jobs until the contract was completed successfully in mid-October.

By this time, Poulin and Central Aircraft were experiencing financial problems. There wasn't enough money coming in and new helicopters were very expensive. As a result, numerous Central personnel were let go.

The following year was also challenging for Central, with crop and orchard spraying increasing dramatically and becoming a mainstay for the company, as other contracts were becoming more difficult to secure due to competition from other commercial companies.

By 1950, Central was back in Alaska with a Bell 47B mapping surveys for the U.S. Department of the Interior. Seeding programs at forest fire burn sites were also happening, along with dusting and fogging operations in Washington, Oregon and California. Profits were scarce and in December 1950, Beebe, then director of maintenance, left Central after four years, returning east to work for Bell Aircraft Inc.

Poulin concentrated on dusting in wheat country in the late spring of 1951, with Jones and Hall in charge of agricultural dusting and spraying operations in the Walla Walla and Colfax, Washington, areas, and orchard and roll crop jobs in the Yakima Valley.

In mid-April, Poulin pulled his agricultural helicopter away from dusting work and arranged for it to be sent to Alaska to work on a U.S. geological survey. Jones was not impressed, since he had several thousand acres left to spray. When he left Central,

he leased a ship from Rick Helicopters in California and resumed spraying wheat a few days later. Hall also resigned, and the two ended up flying for Economy Pest Control in Alaska.

Central Aircraft's position was dire enough to force it to declare bankruptcy. It reorganized under the name Herman A. Poulin Inc. and continued to fly in the Yakima Valley area. However, Poulin ceased operations after a few years in Yakima and moved to Oregon.

"Herm kind of faded away, but resurfaced in the early 1960s, operating a company called Reforestation Services," Dan Jones, son of Kermit Jones, said in a recent email. "Poulin operated Hiller 12E helicopters and was heavily involved with forestry and railroad right-of-way spraying."

Poulin died in Belfair, Washington, in 1974. He had influenced the growth of the helicopter industry from the early days of commercial rotary-wing flight, through the 1960s. His management style, skills and reputation will not be forgotten by the many people who worked for and with him.

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Bob Petite | Bob is a member of the Twirly Birds, The Vertical Flight Society, the Canadian Aviation Historical Society, the American Aviation Historical Society and the Bell 47 Helicopter Association, Inc. He

is the author of The Bell 47 Helicopter Story.

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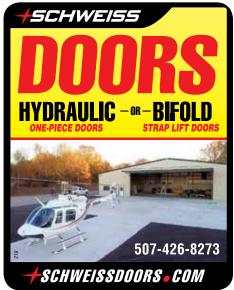




























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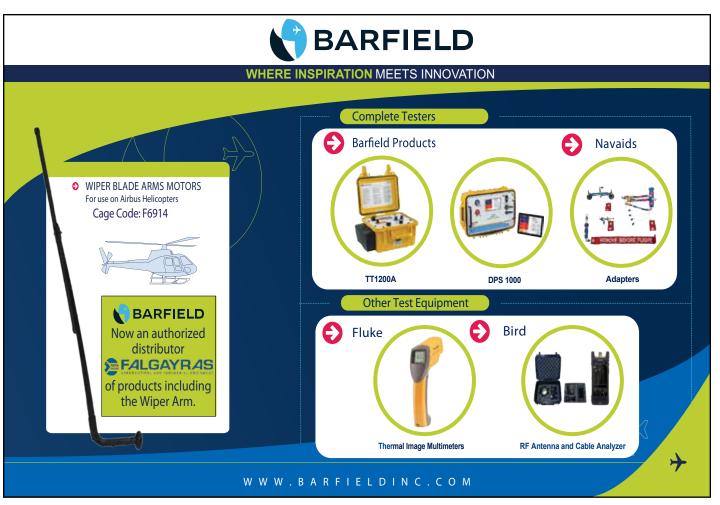
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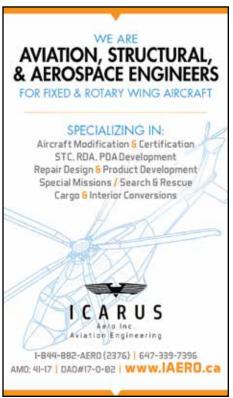
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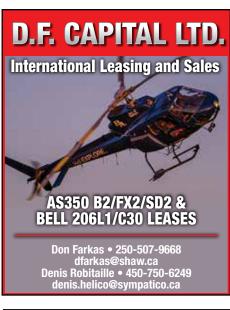


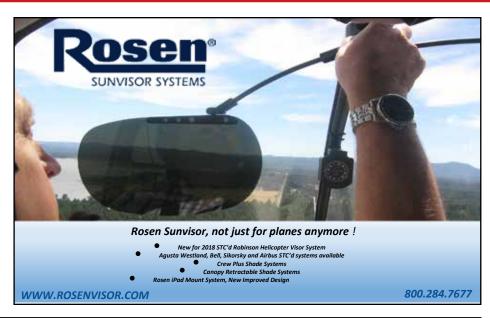






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THERE I WAS... // MIKE MUENCH

As the old saying goes: Be careful what you wish for. After acquiring several thousand hours experience flying helicopters and earning an Airline Transport Pilot (ATP) certificate, I landed my first helicopter emergency medical services (HEMS) job.

The rewards were many, and satisfying. I was lucky enough to work with the best medical crews in the business. To borrow a phrase, "It was the best of times, it was the worst of times."

The camaraderie of the team more than offset the crazy work schedule and requirement to fly in all sorts of weather. The demands on a pilot and medical crew can change in a heartbeat at night, and at altitude.

As the sun was setting in the west one day, we got a call to head east from Columbia to Myrtle Beach, South Carolina. I remember thinking that on such a long flight this late in our shift, it was good to be flying away from the setting sun, instead of into that blinding light. I called weather briefing for an update, since flying from inland areas to the coast as the evening temperatures change can trigger some unusual weather phenomena.

Our call was for a patient transport from a hospital in Myrtle Beach to the Medical University of South Carolina in Charleston. Since the patient was at a medical facility and in stable condition, there wasn't the same urgency that we often encountered with motor vehicle accidents in the middle of an interstate highway or with an electric shock accident.

"Do we have enough fuel?" asked the flight nurse. "Do we have enough blood?"

She glanced over her shoulder at me and cracked a smile, because she knew I appreciated her reminders to not overlook essentials, like fuel. An easy back-andforth banter with the medical crew made a stressful day a little less stressful.

I pressed the starter, engaging the powerful turbine, and soon we were airborne.

The flight to the coast was peppered with a few friendly barbs. The flight paramedic joked with the flight nurse about who was more knowledgeable in the art of intubation. As we approached our destination, the conversation turned to patient care considerations and refueling plans for when the crew was preparing the patient for the next leg of the flight to Charleston.

After I dropped off the crew, I went to fuel up at the closest airport. I arrived back at the hospital in darkness, finding the flight nurse, paramedic and patient ready to go. It was the end of a long day, so we hotloaded and were on our way for the 100-mile trip to Charleston.

As we started a climb to 4,500 feet, I heard the medical crew discussing the patient's vital signs with a bit of apprehension in their voices. We were at max cruise power and our Bell 407 was moving across the sky at a pretty good speed as I tuned the radio to Charleston air traffic control and sat back for a nice, smooth ride

"You guys OK in the back?" I asked. No answer.

The next words I heard were, "Whoa! Sir, lie down!"

I looked back to see the patient obviously in distress, and only partially restrained. His hands were flailing, he was reaching for something to grab, and was way too close to the door handle for comfort.

The flight paramedic, who was not a big guy, was lying on the patient while the flight nurse tried desperately to secure restraints. "Get the paralytics," I heard someone say.

There are many reasons a patient might become combative, but, at that moment, I didn't need to know the cause.

"Mike, this is crazy. Can we land?" the flight nurse asked.

I looked below and ahead, but all I could see was darkness. I flipped on the spotlight and saw there was nothing below us but swamp. In South Carolina, swamp means alligators and thoughts of a recently-caught 13-footer crossed my mind.

As the battle continued, the patient's leg restraints loosened, and one of his legs stretched over the pilot/patient partition; equipment that became standard on HEMS helicopters after a combative patient grabbed a pilot's collective pitch control, with disastrous results.

I grabbed his leg and held tight, figuring three-against-one had to be better odds, until I heard the paramedic yell, "Let go of my leg!" Oops.

Thankfully, the medical crew were able to inject the patient with a powerful sedative, and as quickly as it started, the struggle ended. At that point, the altimeter read 3,700; we had dropped 800 feet during the fracas.

Apparently, the patient woke up with chest pain and trouble breathing and he panicked.

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