

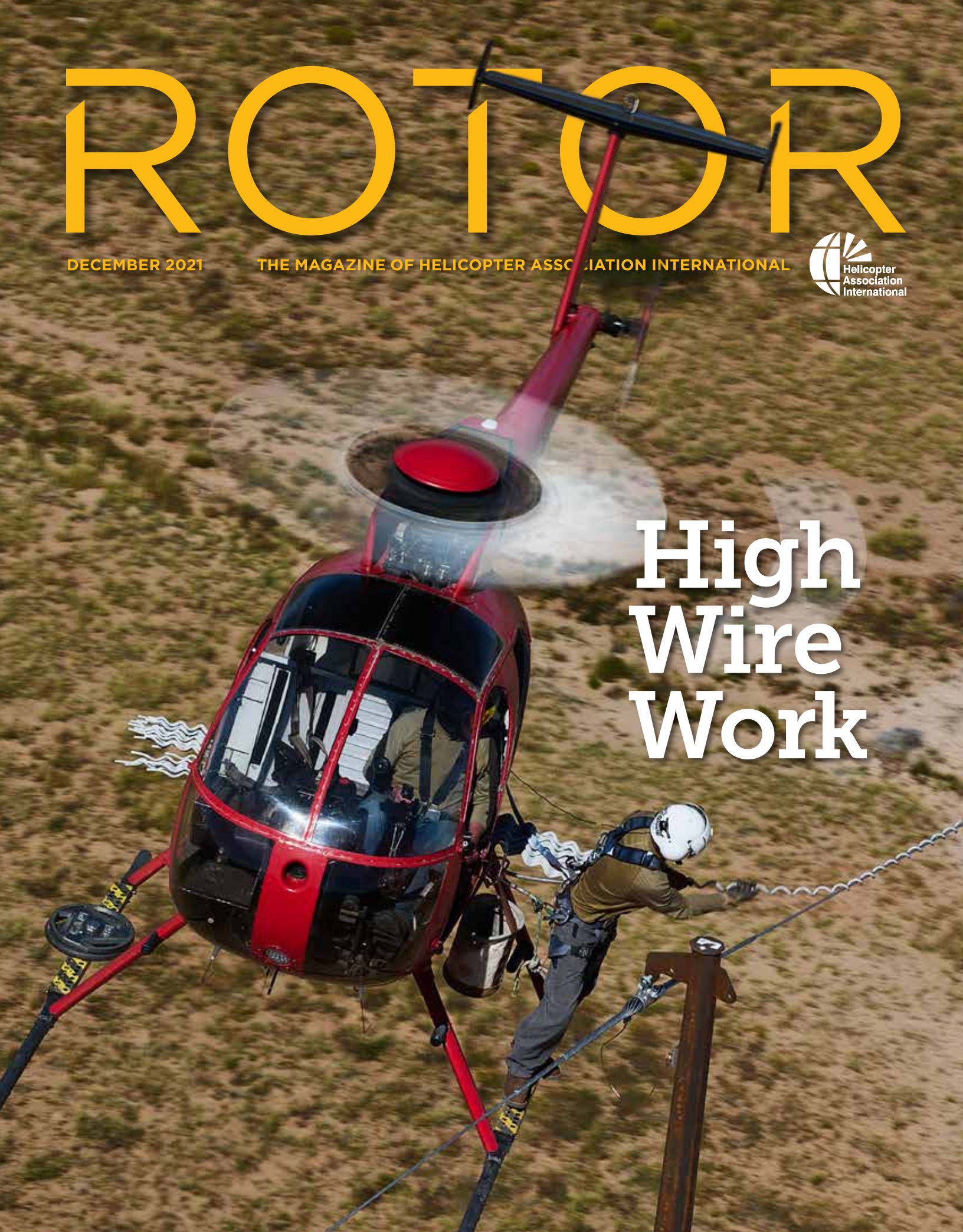
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DECEMBER 2021

THE MAGAZINE OF HELICOPTER ASSOCIATION INTERNATIONAL



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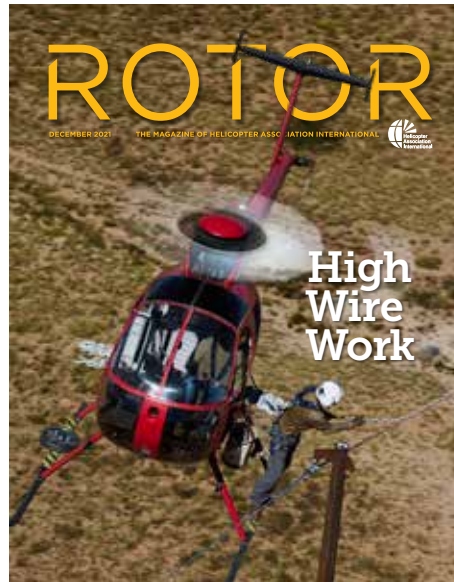
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ON THE COVER: An MD Helicopters MD 500D operated by Rotor Power holds a lineman in place to coil vibration dampeners onto a newly installed optical ground wire in central New Mexico. The dual-purpose wire combines the functions of grounding and communications. Read more about how helicopters help maintain the power and communication services essential to modern life in photographer Mark Bennett's photo essay on p. 42.

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Mark Bennett worked for McDonnell Douglas Helicopter/Boeing for a decade, then in 1999 cofounded an aerospace-only marketing agency. With

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Jen Boyer is a 20-year journalism and public relations professional in the aviation industry, having worked for flight schools, OEMs, and operators. She holds a

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Cade Clark

HAI's VP of government affairs, Cade Clark has directed association advocacy programs for more than 20 years. Growing up, Cade worked at an FBO where he

learned to fly, washed planes, got in the mechanics' way, idolized the old-timers and their stories, and deepened his love for all things general aviation.



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Jaasmin Foote joined HAI as the association's social media manager in March 2020, just a week before the COVID-19 pandemic lockdown. She holds a bachelor's degree in

English and is currently pursuing her master's in marketing. Jaasmin is responsible for all the cool posts on HAI's social media platforms. Follow us, drop by, and say hi!



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After an aviation career in the US Army and Coast Guard, Chris Hill oversaw aviation safety management systems throughout the USCG as aviation safety

manager. He holds an ATP rating and has logged more than 5,000 flight hours, primarily in military and commercial helicopters. Chris joined HAI in 2018 as director of safety.



David Hughes

David Hughes has been writing about aviation for 40 years. As a US Air Force Reserve pilot, he flew the C-5 and C-141 and logged 20 years writing and editing at

Aviation Week & Space Technology magazine. He then joined the FAA to write about NextGen and today is a freelance writer.



David Jack Kenny

David Jack Kenny is a fixed-wing ATP with commercial privileges for helicopter. He also holds degrees in statistics. From 2008 through 2017, he worked for AOPA's Air

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Gina Kvitkovich

Gina Kvitkovich joined HAI as director of publications and media in 2011 after decades of honing her skills in writing, editing, and publishing. As editor of ROTOR,

she is responsible for every error in the magazine that you're reading—and for some of the good stuff, as well.



Zac Noble

Zac Noble, HAI director of maintenance and technology, has over 37 years of experience as a pilot and mechanic. He spent 11 years flying in the air medical

sector before coming to HAI and is a veteran of the US Army, where he flew helicopters and multiengine airplanes. Zac is a dual-rated ATP, a dual-rated CFII, and an A&P mechanic with IA privileges.



John Shea

John Shea joined HAI as director of government affairs in 2019. He came to HAI from the National Association of State Aviation Officials (NASAO), where he was

interim president in 2018 and lead government affairs representative since 2017. Previously, as a legislative staffer, John advised multiple members of Congress on transportation policy.



Dan Sweet

Dan Sweet joined HAI as director of communications and public relations in 2017. He previously served in the US Navy as a photojournalist. After leaving the

Navy, he worked for Oregon-based Columbia Helicopters, performing public relations, communications, and trade show management work for more than 22 years.



Emma Taylor

Emma Taylor joined HAI as a policy analyst in 2020. She graduated *cum laude* from Villanova University in December 2019 with a major in political science. Driven

by her passion for public policy and advocacy, Emma is thrilled to start her career at HAI and has since developed a deeper appreciation for the vertical lift industry.

WRITE FOR ROTOR

Got something to say to the international helicopter industry? We're listening. Email story ideas, manuscripts, or questions to letters@rotor.org. Visit rotor.org/write for more information.



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“HAI is our industry advocate; they need to hear from you so they know what to fight for and what is important to you as a pilot or organization.”

– Grayson Barrows, repair station general manager



JOIN HAI

FOR MORE THAN 70 YEARS, HAI HAS REPRESENTED ALL ASPECTS OF THE VERTICAL flight industry, promoting safety, professionalism, innovation, and economic viability.

Current HAI priorities include:

- Ensuring COVID relief for operators
- Advancing industry integration of unmanned aircraft systems and advanced air mobility aircraft
- Developing the global vertical flight workforce
- Strengthening safety collaboration within the international vertical flight industry

By Randy Rowles

HAI's International Leaders

The best way to support the global VTOL community: join HAI and get involved.



An FAA pilot examiner for all helicopter certificates and ratings, Randy Rowles holds an FAA ATP and Gold Seal Flight Instructor Certificate and in 2013 received HAI's Flight Instructor of the Year Award. Chairman of the HAI Board of Directors for 2021–22, Randy operates the Helicopter Institute, a Texas flight school.

FOR MANY YEARS, HELICOPTER ASSOCIATION INTERNATIONAL (HAI) has been seen as a membership organization that concentrates mostly on the US helicopter market. But that is changing.

Part of the credit for this change must go to its leadership. Jan Becker, CEO of Becker Helicopters Pilot Academy in Queensland, Australia, and the 2019–20 chair of the HAI Board of Directors, was the source of many positive changes within HAI. A strong, visionary leader, Jan was passionate about strengthening HAI's international reach, and she educated her colleagues about the importance of acknowledging national and regional differences on matters as simple as meeting times, cultural norms, and terminology.


When Jim Viola became president and CEO of HAI in January 2020, strengthening the "I" in HAI was one of his top priorities. Under his direction, HAI has deepened its relationships with national and regional helicopter associations around the world through its International Partnership Program. In their regular meetings, the partners share information on topics such as COVID-19 safety protocols and aerial firefighting best practices. Building connections such as these enhances safety and efficiencies for operations around the world.

Jim is also passionate about improving global safety, and so HAI is a member of the Vertical Aviation Safety Team, a worldwide initiative to enhance operational flight safety in all sectors of rotorcraft aviation. The causal factors for accidents do not change based on your location, so working together to improve global safety makes sense. In addition, we should remember that any accident, anywhere in the world, could affect how your future customers perceive the risk involved in vertical aviation.

On Nov. 16, 2021, HAI took another step toward embracing a more active global role, as it announced a formal partnership with the European Helicopter Association. While the two associations have collaborated before, the agreement provides a structured path for them to work together on initiatives and programs.

But incorporating an international outlook into HAI policies and programs isn't just a task for the HAI leadership. We also need the assistance of our members. By providing your regional perspective, just as Jan did, you enable HAI to better understand the pain points and lessons learned of our diverse, global industry. The best way to provide that perspective is by taking an active role within our leadership structure and participating in HAI's working groups.

With HAI HELI-EXPO 2022 coming up in Dallas, this is a great time to get involved. All HAI working groups will hold meetings in conjunction with our annual conference. Please review the schedule at rotor.org/working-group for the working group that best suits your interests. All provide you with an opportunity to help lead change within the global vertical lift industry.

As a pilot, flight trainer, and aviation executive, I have worked with pilots and operators around the world. We share the same love for aviation that has blessed us with exciting, fulfilling careers. We also share the same challenges globally as we strive to maintain safe, compliant, successful vertical flight operations. This is precisely why HAI exists: to help our members meet those challenges. 

A stylized, handwritten signature in blue ink that reads "Randy".

By James A. Viola

What Do You Do?

UAM, AAM, or both?



James A. Viola is HAI's president and CEO. After a career as a US Army aviator, he joined the FAA, where he served as director of the Office of General Aviation Safety Assurance before joining HAI. A dual-rated pilot, Jim holds ATP ratings in both airplanes and helicopters and is a CFII. Jim can be contacted at president@rotor.org.



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URBAN AIR MOBILITY (UAM) IS A HOT TOPIC RIGHT NOW. People find it thrilling to think that on some future day a passenger will board an aircraft in a major metropolitan city and be whisked quickly, efficiently, and safely across town.

If you are reading ROTOR magazine, you know that the helicopter industry has been conducting UAM missions for decades. A company called Helicopter Air Transport was completing commercial urban helicopter flights in 1946 in the Camden, New Jersey, area just a few months after the FAA certificated the helicopter for civil use the previous March.

One of the more famous UAM flights was the first presidential flight, on Jul. 12, 1957, carrying Dwight Eisenhower from the White House to Camp David in Maryland.

According to the FAA, UAM will use "highly automated aircraft that will operate and transport passengers or cargo at lower altitudes within urban and suburban areas." Advanced air mobility (AAM) expands the UAM concept to include missions outside of urban centers, including cargo delivery, public service operations, and intercity flights. Our industry has been actively engaging in this type of work for more than 70 years. In fact, experienced helicopter pilots will most likely be at the controls of UAM/AAM aircraft, either in person or remotely.

Other governments are also working to determine the future for UAM/AAM in their countries. In a [2021 policy statement](#), the Australian government recognized the benefits of using eVTOL and other technologies to "bridge the tyranny of distance to connect people, goods and services with regional and remote areas" of the country. The International Civil Aviation Organization told attendees at a [June 2021 event](#) that UAM was "an opportunity to construct a green and sustainable" aviation sector. While seeing much promise, however, all acknowledge that there still remain substantial challenges for the UAM/AAM sector, including ground infrastructure, battery energy density, and certification.


The lengthy regulatory and certification process required to integrate an entirely new class of aircraft into the airspace will look familiar to anyone working in the rotorcraft industry. Helicopter manufacturers, operators, pilots, and maintenance personnel are accustomed to working in a highly regulated environment; they understand why the highest safety standards must be maintained. That is just one more reason we will be leaders in UAM/AAM operations.

We must recognize UAM/AAM for what it is: an opportunity. Prepare to accept these future aircraft into your business model to complement what you are doing today with helicopters. Your background and experience in vertical flight will enable you to best leverage this technology.

As we welcome these new aircraft, our entire industry will benefit when we work together to:

- Expand the vertical flight infrastructure
- Develop additional capabilities to meet societal needs.

HAI wants to pave the roads you need to travel to achieve future growth. Please tell me the hurdles that keep you from doing more today with your helicopters. Where do you foresee obstacles with the new VTOL and eVTOL aircraft you want to bring into your operations? Please reach out to me at president@rotor.org with your concerns.

The next time someone begins to tell you about the coming wonders of urban air taxis, tell them, "That future is already here. I have been flying UAM and AAM for some time." 

By Peter Moeller

Meeting Tomorrow's Challenges

Working together, we're advancing the VTOL industry's sustainability, safety, and efficiency.



Peter Moeller started his career in 1975 in the German Army Aviation Corps. Since 1982, he's worked in aerial operations, commercial air transport, and air ambulance operations in Europe and West Africa. He has served as flight operations manager, crew training manager, and managing director at Air Lloyd Deutsche Helicopter Flugservice and as crew training manager and flight operations manager for Luxembourg Air Rescue.

AT THE END OF THIS YEAR, MY TERM AS CHAIRMAN of the European Helicopter Association (EHA) will end. My successor as chairman and technical director, Christian Müller, nominated by the Swiss Helicopter Association, will start his mandate on Jan. 1, 2022.

Having been a member of the helicopter community for more than 44 years in the roles of pilot, flight instructor, examiner, managing director, and more, it was an honor to serve as EHA chairman. I'm grateful I was able to give back to the helicopter community through my work at EHA over the past 16 years and especially during my time as chairman for the past 3 years.

Thanks to the EHA team's exceptional work, the association has thrived despite all the challenges the rotorcraft industry has faced in recent years. With the establishment of the EUROPEAN ROTORS VTOL Show and Safety Conference in 2021, there's now an annual European platform available for the entire VTOL industry, including operators and their personnel, OEMs, service providers, suppliers, and the European Union Aviation Safety Agency (EASA). This event provides participants with a place to exchange experiences, promote technical and regulatory innovations, and develop new business on an international level.


Close cooperation with our colleagues at EASA and HAI will improve EHA's ability to prepare our members, and the VTOL industry at large, to meet tomorrow's challenges. EHA is proud to have found in HAI a partner with whom to accomplish this work in Europe and worldwide.

Some of those future challenges will be front and center for the rotorcraft industry next year. There's probably no one in the helicopter business who hasn't been involved in discussions recently about urban air mobility, advanced air mobility, eVTOLs, and unmanned aircraft systems. These spaces will definitely change the vertical lift market, and operators need to be prepared to accommodate them. It is my firm conviction that these new technologies will also open business opportunities to experienced helicopter operators. After all, who else has the expertise to operate aircraft safely in the lower airspace in urban environments?

Another important topic for 2022 is the protection of our planet. I believe we can agree we all need to contribute to reducing atmosphere-destroying emissions, in all areas of our lives, including the operation of our aircraft. Therefore, EHA regularly follows new developments and research projects from engine and airframe manufacturers, fuel suppliers, and operators that already participate in tests to use sustainable aviation fuels (SAFs) to make VTOL operations greener.

As part of its sustainability efforts, EHA plans to participate in the new Renewable and Low-Carbon Fuels Value Chain Industrial Alliance, with a particular focus on aviation. The alliance brings together all relevant stakeholders, including the full industrial value chain, public authorities, civil society, and financial institutions, to work to boost the production, distribution, and use of sustainable fuels. The alliance will support the goal of enabling the greater availability and affordability of SAFs to accelerate the decarbonization of aviation. It's the continual intention of VTOL industry stakeholders to make every effort to develop the industry by improving its safety, efficiency, and sustainability to provide better services to society.

With best wishes for the future of EHA and the entire VTOL industry, I wish you and your families all the best in 2022.

Stay healthy and fly safe! 

The Future of 5G and Aviation Operations

HAI stands ready to work with telecom industry to protect aviation systems.

IT'S HARD TO BELIEVE THAT 2021 is coming to a close. There are numerous legislative issues that have captured our industry's attention in the past year. However, we'd like to highlight one that will have major impacts on future industry operations: the planned deployment of 5G networks, which will destabilize safety-critical systems on all civil aircraft, especially helicopters.

HAI's 5G Involvement

In the June and September 2021 editions of ROTOR, we discussed the problem of spectrum interference. In the June issue, we shared an overview of the actions by the Federal Communications Commission (FCC) to repurpose spectrum adjacent to the frequencies used by some safety-related aviation equipment. In addition to interference with the L band, which will affect GPS service and satellite-to-ground communications, FCC actions have paved the way for deployment of 5G wireless systems adjacent to C band frequencies that are used by radar (radio) altimeters.

In the September issue of ROTOR, we expanded on HAI's advocacy on the 5G issue, which began in 2017 with our initial opposition efforts after the FCC first released a notice of inquiry about repurposing C band spectrum. We also discussed HAI's efforts to address 5G interference at an international level, as the threat posed to aviation safety by repurposing C band frequencies for 5G wireless systems is a global one.

Through its international partnerships, HAI stays abreast of international research efforts and regulatory proposals on 5G interference. These materials from the international aviation community serve as valuable learning tools for the US industry as it explores actionable mitigations.

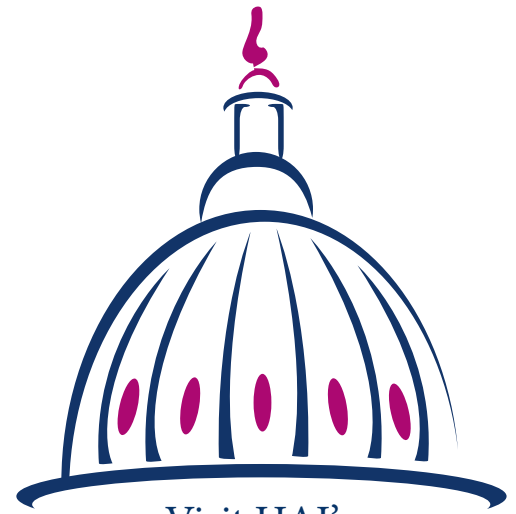
On behalf of a coalition of aviation industry stakeholders, HAI co-chairs a technical and operations

working group that evaluates both the impact of 5G on aviation operations and the actions that can be taken to mitigate those impacts, both in the United States and elsewhere. HAI will continue to do whatever it takes to protect our members and the industry while ensuring the safety of pilots, crews, and customers.

Recent Efforts in the 5G Sphere

Over the past few months, HAI and several industry partners have met with officials from both the FAA and FCC to discuss 5G deployment. During these meetings, HAI has communicated the importance of maintaining the reliability of radar altimeters in helicopters and other vertical lift aircraft, which are most at risk of interference from 5G systems because of their low-flying operations in challenging environments. Radar altimeters are required equipment for all US commercial helicopter operations. Additionally, the FAA-mandated helicopter terrain awareness and warning systems for helicopter air ambulance (HAA) operations have a radar altimeter requirement, as do helicopters equipped with night-vision goggles.

HAI and other members of the aviation coalition have asked the FAA and FCC to jointly facilitate collaborative discussions between the aviation and telecommunications industries to find solutions for potential interference. Coalition representatives have also requested that the FAA carefully weigh the costs, both financial and societal, of implementing future interference mitigation plans. During these meetings with FAA and FCC representatives, HAI has illustrated the disruption 5G interference could have on HAA operators by explaining the



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complexity of the operational environment, the implications of landing at off-site locations, and the time-sensitive nature of HAA flights.

On Nov. 2, 2021, the FAA released a Special Airworthiness Information Bulletin (SAIB), [AIR-21-18](#), on the risk of potential adverse effects on radar altimeters from 5G operations. The SAIB informs aircraft manufacturers, radar altimeter manufacturers, operators, and pilots of the planned deployment of wireless broadband networks in the 3700–3980 MHz bands. At that time, 5G was scheduled to begin deployment on Dec. 5 in the 3700–3800 MHz bands.

The aviation coalition filed written ex parte filings with the FCC referencing the FAA's safety concerns as expressed in its SAIB. Coalition representatives also cited a deficiency of essential information in the FCC public record about 5G systems, resulting in a lack of the data needed to make decisions about aviation safety. This deficiency only reinforced the need for interagency and interindustry coordination to answer the many questions regarding 5G interference and aviation safety.

5G Deployment Delayed

On Nov. 4, 2021, the wireless industry agreed to delay its scheduled 5G deployment by one month, until Jan. 5, 2022. In announcing the delay, AT&T and Verizon Communications stated their intent to work in good faith with the FAA and FCC to address concerns about potential interference with safety-critical aviation systems.

HAI and other members of the aviation coalition briefed the White House National Economic Council (NEC) on the 5G issue in early November. Industry representatives expressed their collective concern about the restrictions that may be placed on aviation operations if the telecommunications industry fails to put forward reasonable

HAI Members

HAI is here for you! Contact advocacy@rotor.org with your legislative challenges.

mitigations to address radar altimeter interference.

Restrictions on helicopter operations will have devastating effects on critical industries such as helicopter air ambulance, oil and gas, firefighting, and utility and power-line work. Aviation coalition members have made it clear that cooperation among all stakeholders is necessary to create and implement solutions that protect the safety of the US National Airspace System (NAS) and support the utilization of 5G technology.

Interagency Technical Working Group

Following the release of the FAA's SAIB and the meeting with the aviation coalition, the NEC agreed to coordinate a technical working group with representatives from the aviation industry, telecommunications industry, FAA, and FCC to develop actionable mitigations. HAI and industry stakeholders continue to meet regularly with regulators and the NEC to discuss necessary mitigations.

AT&T and Verizon Proposal Concerns

On Nov. 21, 2021, AT&T and Verizon Communications announced plans to adopt new precautionary measures to address the safety concerns of the FAA and the aviation industry. The telecommunications proposal would place limits on power levels at 5G base stations near public-use airports with paved runways and near public-use heliports. HAI and the aviation coalition appreciate wireless carriers'

acknowledgment that 5G deployment will interfere with safety-critical aviation equipment if it proceeds as currently allowed.

However, Verizon and AT&T's measures are inadequate and far too narrow to ensure the safety and economic vitality of the aviation industry. There are significant technical shortfalls in their proposal that, if left unchanged, would have little to no impact on addressing aviation concerns.

The Aviation Counterproposal

On Dec. 6, 2021, aviation coalition stakeholders filed a letter with the FAA that included the [Aviation Safety Proposal for 5G Limits](#) for discussion and consideration. This proposal is in response to AT&T and Verizon's Nov. 21 proposal.

The coalition's proposal builds on the telecom proposal and provides additional safeguards in, around, and on the approach to airports and heliports. It also aims to minimize the impact on both telecom and aviation operations. HAI and other coalition members look forward to continuing to work with all stakeholders to find a win-win solution for both industries and for the flying public.

FAA Takes Cautious Approach

The FAA has a history of ensuring safety by accounting for the worst-case scenarios, and that is exactly how the agency was expected to respond to the possibility of 5G interference with safety-critical equipment. Given the sheer number of questions and concerns left unanswered by the telecommunications industry, the FAA had no choice but to act to protect safety within the NAS.

To effect immediate changes in US aviation operations, the FAA has several tools at its disposal, including Notices to Air Missions (NOTAMs), temporary flight restrictions (TFRs), and airworthiness

directives (ADs). On Dec. 7, the FAA submitted two ADs to the *Federal Register* for publication: [AD 2021-23-12](#), which covers transport and commuter category airplanes, and [AD 2021-23-13](#), which applies to helicopters. Effective as of Dec. 9, the ADs require flight manual limitations that prohibit certain operations requiring radar altimeter data at locations that will be identified in NOTAMs to be issued in early 2022.

The helicopter AD states that when operating in US airspace, the following operations requiring radar altimeters are prohibited in the presence of 5G C band wireless broadband interference as identified by the appropriate NOTAM:

- Performing approaches that require radar altimeter minimums for rotorcraft offshore operations; barometric minimums must be used for these operations instead

- Engaging hover autopilot modes that require radar altimeter data
- Engaging search-and-rescue autopilot modes that require radar altimeter data
- Performing takeoffs and landings in accordance with any procedure (Category A, Category B, or by Performance Class in the Rotorcraft Flight Manual or Operations Specification) that requires the use of radar altimeter data.

The aforementioned ADs were submitted as this issue of ROTOR was going to press; please visit rotor.org/radalt for additional analysis.

One issue that is already gaining attention is the sheer number of locations that will be affected by 5G deployment. The map on [p. 12](#) illustrates heliports in the continental United States that are located within a 5G deployment area. Some types of helicopter



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operations within those areas will be effectively banned. However, this map fails to portray the full impact of 5G. The map was developed using the FAA Airport Master Record Database, which lacks substantial data on heliport locations.

disruptions to rotorcraft operations. HAI will provide additional information as it becomes available.

A Safe Path Forward

HAI's highest priority is safety, and the association is committed to doing whatever it takes to keep our pilots, crews, and passengers safe. The aviation community stands ready to work with the wireless industry, the FAA, and the FCC on data-driven technical solutions to ensure that we can reap the benefits of 5G technology without risking aviation safety or efficiency.

As always, HAI will keep you, our members, informed of the latest developments on the 5G issue.

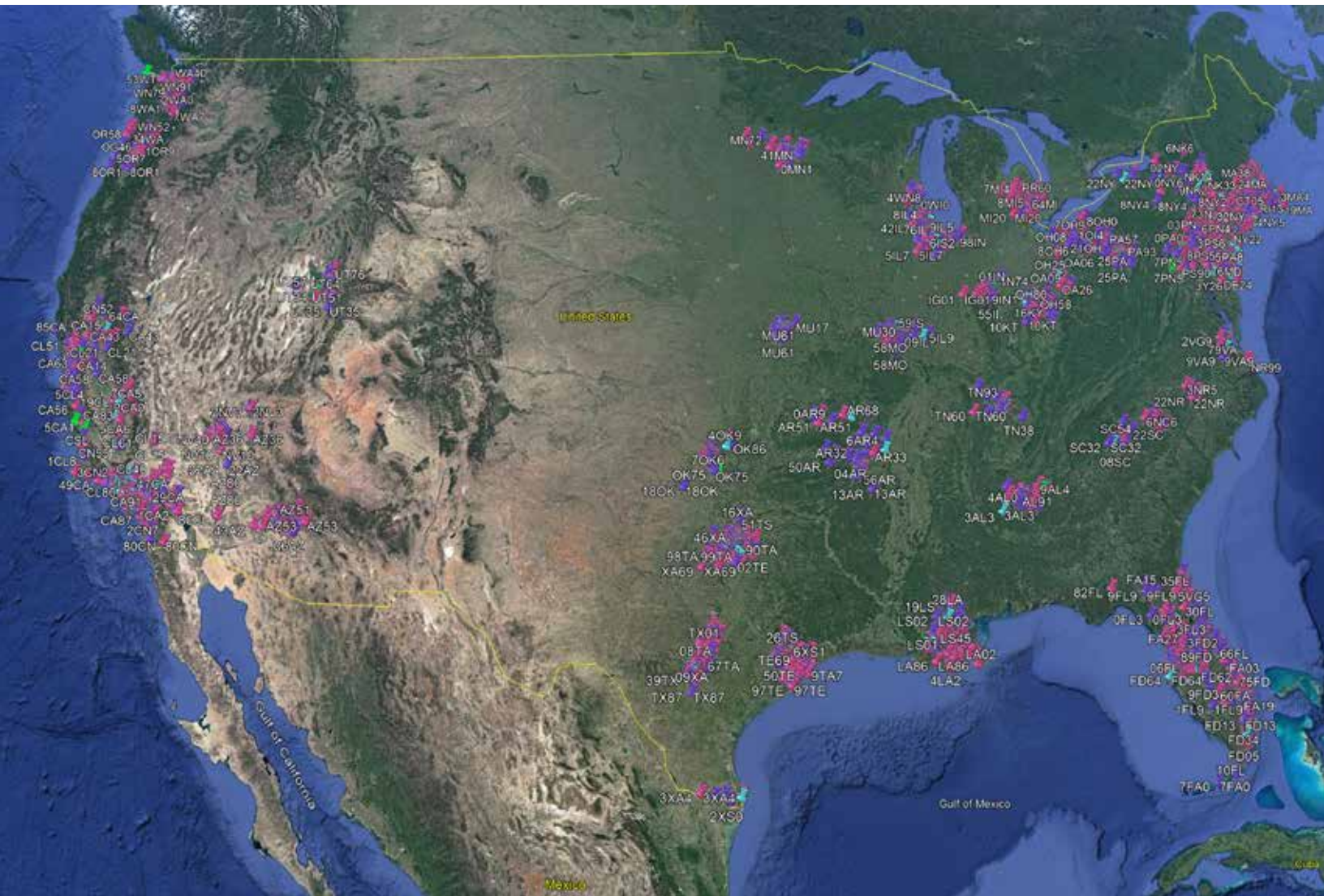
Please refer to our website, rotor.org/advocacy, for more information. Recent letters, statements, ex parte filings, and other related materials are available at rotor.org/radalt.

This map illustrates the thousands of public and privately owned heliports that are located in the 46 zones where 5G is set to first deploy, on Jan. 5, 2022.

Privately owned heliports are marked with a pink pin, medical-use heliports with a purple pin, military heliports with a green pin, and publicly owned heliports with a teal pin.

According to NASA estimates, upward of 2,000 hospital heliports aren't accounted for in the FAA database. In addition, approximately 2,000 to 4,000 pre-designated emergency landing area sites are also not represented in either the FAA database or the NASA estimate. It's unclear how NOTAMs will be issued for aviation locations that have not yet been identified as such by the FAA.

At press time, HAI was still waiting for clarification from the FAA on how the ADs and subsequent NOTAMs will be operationalized. With the vast number of heliports that may be affected, there may be substantial



ROTORWASH

INDUSTRY DATA, TOPICS, ADVICE, HAPPENINGS, ISSUES, AND NEWS TO KEEP THE ROTORS TURNING

HAI BRIEFS

HAI and EHA Form Collaborative Partnership

HAI AND THE EUROPEAN Helicopter Association (EHA) have formed an official partnership to increase collaboration between the two organizations on initiatives and programs supporting the international vertical takeoff and landing (VTOL) industry.

EHA Chair Peter Moeller announced the news Nov. 16 at the 2021 EUROPEAN ROTORS VTOL Show and Safety Conference in Cologne, Germany, with HAI President and CEO James A. Viola joining him on stage (see photo above).

"The European Helicopter Association and Helicopter Association International



 **WATCH**
Footage of EUROPEAN ROTORS 2021

share common priorities, interests, and goals in promoting safety, professionalism, and innovative advancements within the industry, as well as driving to improve the

economic viability of the VTOL sector," Moeller said at the event.

"This partnership strengthens the already-close relationship between HAI and EHA and represents our commitment to work together to meet our aligned goals," added Viola. "We both want to see a VTOL industry with zero accidents that can continue its work on behalf of society while being economically vibrant, growing, diverse,

and sustainable. By combining our resources and efforts, we will see increased efficiencies that will in turn help HAI and EHA make a greater impact. ➤

1126 17 55 21

Overview ⓘ

Accounts Reached 19,657

Content Interactions 1,219

Profile Activity 115

We tickled our followers' funny bones on Halloween with this 2015 photo. Many people enjoyed the post and shared their own jokes about it. It received over 22,000 aggregate impressions on Facebook and Instagram and 1,298 aggregate engagements on both platforms.



HAI ON SOCIAL

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-  /company/helicopter-association-international
-  /HelicopterAssoc #haiexpo22

► We firmly believe our members and the international VTOL community will benefit from this agreement.”

While the official partnership doesn't go into effect until Jan. 1, 2022, the two groups have already begun exploring opportunities to leverage their combined membership and strength on programs that bolster the industry and support their members. On the international level, the

“We want to see a VTOL industry with zero accidents that can continue its work on behalf of society while being economically vibrant, growing, diverse, and sustainable.”

—James A. Viola, HAI President and CEO

two are both active in the [Vertical Aviation Safety Team](#) and within HAI's [International Partnership Program](#). At the regional level, HAI provided EHA with marketing and operational support as the latter association organized the first edition of EUROPEAN ROTORS this year.

The EHA represents the helicopter community in 11 European countries; HAI represents the international helicopter industry

with a membership of more than 1,100 companies and 16,000 industry professionals in more than 65 countries.

HAI BRIEFS

'56 Seconds to Live' Wins Top Honors

AVIATION INTERNATIONAL NEWS has awarded HAI, the US Helicopter Safety Team (USHST), and the Vertical Aviation Safety Team (VAST) its 2021 Contribution to Safety Top Flight Award for the organizations' collaborative "56 Seconds to Live"

video and companion course.

Announced on Dec. 1, the media company's Top Flight Awards are designed to recognize the best and brightest in business aviation and to honor creativity, innovation, quality, and passion as well as significant contributions by aviation industry professionals.

The USHST conducted a study of 221 fatal helicopter accidents between 2009

and 2019 and found that most happened within 56 seconds of encountering unintentional flight into instrument meteorological conditions (UIMC). Developed to increase awareness of UIMC, the "56 Seconds to Live" video was released in February 2021, just days after the National Transportation Safety Board (NTSB) issued its probable-cause finding on the Jan. 26, 2020, Calabasas, California, helicopter crash that killed Kobe Bryant and eight others. The NTSB determined that the accident resulted from the pilot having experienced spatial disorientation after inadvertently flying into IMC.

The video takes viewers on a fictional flight, illustrating the pilot's actions and decisions as they unfold as well as factors that contribute to his encounter with UIMC. The one-hour companion, scenario-based training course expands on the experience in the video, teaching pilots to recognize situations that can lead to UIMC and to use sound aeronautical decision-making to stop a flight before an accident occurs.

The course, which is eligible for [FAA WINGS](#) credit, includes a simulated-accident video and four alternate scenarios demonstrating examples of aeronautical

decision-making that would have prevented the accident, as well as video messages from members of the USHST steering committee and other industry leaders. Course attendees also receive guidance, tips, tactics, recommended practices, and links to course-related materials for further learning.

To learn more, watch the video, or take the course, visit ushst.org/56secs/. And for other original HAI resources for pilot UIMC education, written by helicopter pilots for helicopter pilots, see "In the Spotlight," on p. 22.



HAI BRIEFS

Katerina Bedoya Joins HAI as Director of Marketing

EARLIER THIS YEAR, HAI WELCOMED Katerina Bedoya as its new director of marketing. In this position, Katerina will lead the charge to boost HAI's digital footprint around the globe to better serve the association's members.

"Digital marketing makes it easier to determine our members' needs and meet them while supporting the advancement of the international helicopter industry as a whole," says Bedoya. "My goal is to enable HAI to best meet our mission of representing all aspects of the VTOL community by continuing to build two-way communication through our digital channels."

"We are very excited to have Katerina on the team," says HAI President and CEO James Viola. "One of my goals is to boost our presence in the channels where our members prefer to communicate, and Katerina's vast experience and fresh ideas in this arena will help us grow our engagement with and strengthen our support of our members."

Before joining the HAI staff, Bedoya, an international expert in digital marketing and strategic communications, served as a director for Hill+Knowlton Strategies, where she managed digital and influencer campaigns for brands such as LG and Konami and a host of recognized start-up firms. She also worked as a



communications consultant at The World Bank Group headquarters in Washington, D.C.; chief communications officer at the Universidad del Pacifico's Research Center in Lima, Peru; and chief editor of multimedia and social media at the Peru News Agency.

Bedoya, an accomplished storyteller and multimedia producer, received her graduate degree from the Columbia (University) Journalism School, after which she crafted media pieces for press outlets including NPR and Bloomberg News. She is bilingual in English and Spanish.

In her free time, Bedoya volunteers at Women Makers Perú, helping empower women who are leading start-ups in the country. [@](#)

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2006	Dallas	2017	Dallas
2007	Orlando	2018	Las Vegas
2008	Anchorage	2019	Atlanta
2009	Anchorage	2020	Anchorage
2010	Houston	2021	San Diego
2022	Dallas		

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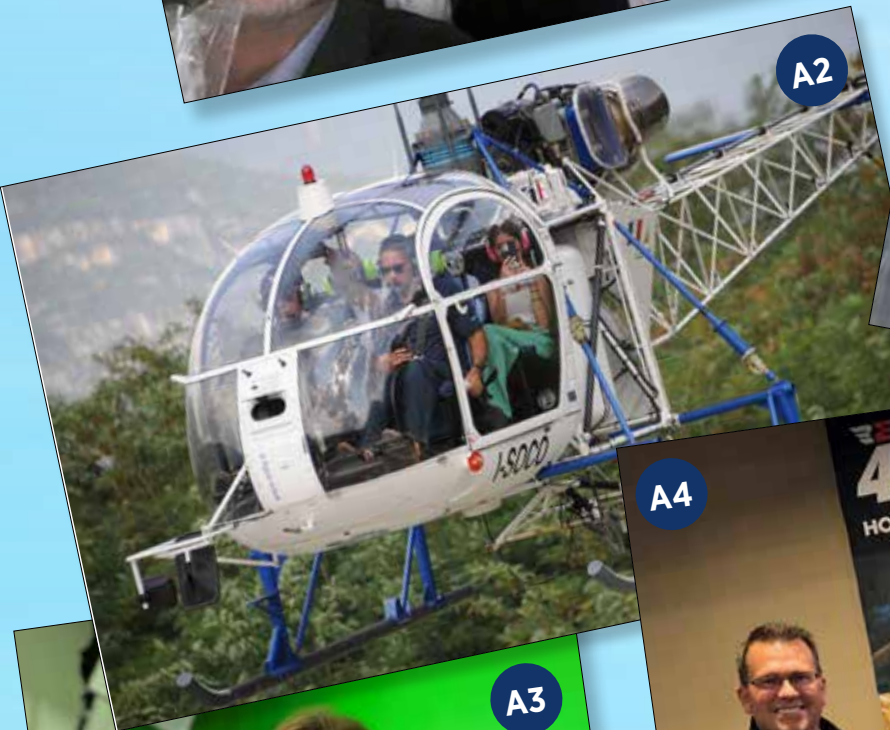
HAI OUT AND ABOUT



A1



A6



A2



A5



A4



A3

A1: Celebrating the new partnership between HAI and the European Helicopter Association (EHA) are, from left, Peter Moeller, EHA chairman; Rob Volmer, HAI VP of marketing communications; Frank Liemandt, EUROPEAN ROTORS show director; and Jim Viola, HAI president and CEO. **A2:** On an August visit to Italy, Jim Viola takes the controls of an SA 315B Lama while touring HAI member Elifly's operations. **A3:** Emma Taylor, HAI policy analyst, shown here during a September video shoot, is excited to spread the word about sustainable aviation fuel. **A4:** Randy Rowles, 2021-22 chairman, HAI Board of Directors, visits with Eagle Copters staff at the HAI Aerial Firefighting Safety Conference in Boise, Idaho, in November. **A5:** Chris Hill, HAI director of safety, and Caylie Cook, HAI exhibits manager, enjoy the vintage aircraft at EAA AirVenture Oshkosh in July. **A6:** Jim Viola visits with Bart Brainerd, VP of Brainerd Helicopters/Firehawk Helicopters, at the HAI member's Florida facility in April.



B5



B1



B2



B4



B3

B1: Jim Viola, HAI president and CEO, and Michel Masson, EASA senior safety promotion coordinator, show off their Vertical Aviation Safety Team gear. **B2:** Jaasmin Foote, HAI social media manager, celebrates Girls in Aviation Day with Washington, D.C., middle-school students. **B3:** HAI represents the helicopter industry at a Capitol Hill press briefing (from left, Emma Taylor, policy analyst; Stacy Sheard, 2020–21 chair, HAI Board of Directors; Jim Viola; Cade Clark, VP of government affairs; John Shea, director of government affairs; and Rob Volmer, VP of marketing communications). **B4:** Katerina Bedoya, HAI director of marketing, checks out the Bell V-280 Valor at the AUSA show in October. **B5:** HAI staff review preparations for HAI HELI-EXPO 2022 during a November visit to Dallas (from left, Chris Hill, director of safety; Caylie Cook, exhibits manager; Harold Summers, director of flight operations; Nicole Haliburton, manager of convention operations and meetings; Charlotte Zilke, senior director of membership and conventions; and Zac Noble, director of maintenance and technology).



By Christine A. DeJoy

How do you conduct briefings for yourself and others?



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FAA Helicopter
Passenger Briefing
Practices

ENSURING FLIGHT SAFETY REQUIRES performing a variety of checks before and during the flight, including thorough preparation of pilots, crew, and, if applicable, passengers. To learn how our readers conduct briefings in their organizations, in November ROTOR conducted an anonymous survey through HAI's ROTOR Daily e-newsletter and the association's social media channels.

None of the 61 rotorcraft professionals who responded flies by themselves; all regularly travel with other crew members and/or passengers. We asked this group whether they conduct crew or passenger briefings and, if so, which checklists they use, if any.

Less than 6% (3 people) of the 61 respondents don't conduct briefings before every flight; rather, they rely on everyone participating in the flight to "just know what to do."

The remaining 94% (55 individuals) said they do conduct briefings. Of this group, 53% (29) employ the FAA SAFETY (Seatbelts; Air Vents; Fire Extinguisher; Exit Doors, Emergencies, and Equipment; Traffic and Talking; Your Questions) checklist for passengers, the most popular option from a list of four common checklists used by pilots. (See Figure 1, at right, to learn which other checklists our respondents use most frequently.)

Regardless of the checklist they use, our respondents agreed that the top 3 most important elements of a briefing checklist, chosen from a list of 13, are danger areas or areas/items to avoid (92%); exit procedures during an emergency, including over water (88%); and the use of seatbelts and shoulder harnesses (83%). (See Figure 2, at far right, to find out how your peers ranked the other 10 checklist elements.)

What about your company? Do your pilots conduct briefings for themselves, or, if carrying crew or passengers, for others? Read on to see what others are doing in their organizations and how their procedures may differ from your own.

Figure 1. If you conduct briefings, which checklist(s) do you employ?



Note: Respondents could choose as many answers as applied to their organizations.

*Responses included "company checklist comprising IMSAFE and PAVE," "helicopter briefing checklist per make and model," "mission-specific briefing/risk assessment," and "for crew, a one-page challenge-and-response checklist; for passengers, a video briefing in the arrival lounge prior to boarding the aircraft."

YOU CAN'T MAKE THIS STUFF UP

We asked our survey respondents to recall their most memorable experience with an unruly passenger or crew member who didn't follow the instructions given in the preflight briefing. Here are some of the more humorous—and alarming—responses.

“Had a passenger who became ill and tried to open the rear door in-flight to vomit because he didn't want to vomit on the floor or use the bag available to him.”

“One reluctant passenger chose to fly despite being briefed about turbulent weather. **He ended up choking me as we encountered turbulence** and only relented as I squeaked out a request to let go so I could fly the helo.”

“Had a passenger who, despite being briefed, upon landing opened the passenger door on his own from inside and got out (while also stepping on the float gear). **He then mistook the marshal's frantic hand signals to get back inside as an indication that he should remove his luggage** from the baggage compartment in the tail area. Fortunately, the marshal ran to physically restrain the passenger and I switched off the engine without incident.”

“Once at a destination (with the rotor stopped), **one of the passengers picked up a long metal pole and carried it straight up into the blades.** The person looked at me and said, ‘Now, I remember you told me to carry long things horizontally; I completely forgot.’ Luckily, there was no damage. After this incident, I realized that a lengthy briefing with too many details could overload my passengers.”

“We had a passenger exit the aircraft when he shouldn't have, and his seatbelt was left dangling. The crew departed for an emergency and didn't see it. After an hourlong flight, the bottom of the helicopter had sustained scrapes and gouges from the seatbelt twisting in the wind.”

“A passenger **pulled the emergency handle on an AStar and just about dropped the door on the asphalt** after we returned from a tour.”

“A senior executive felt he was above the briefing, and I told him he couldn't get on the helicopter without it.”

“A field ranger exited the aircraft and walked under the tail boom to get to the baggage compartment.”

“After we landed and had shut down, **an 18-year-old father nearly walked off the rooftop helipad with his newborn son.**”

“A tour passenger walked toward the tail upon exit, despite multiple reminders not to and an escort nearby. The escort grabbed the guy by the shirt and pulled him back toward the front of the helicopter.”

“A passenger with dementia undid the seatbelt and attempted to open the door in-flight.”

“I had a passenger who started swigging vodka halfway through a tour. I returned to base and got him out.”

Figure 2. What are the most important elements in a briefing checklist?



Note: Respondents could choose as many answers as applied to their organizations.

*Responses included “see something, say something,” “fuel shutoff,” and “airsickness signs, symptoms, and prevention.”

By Jen Boyer



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HAI Webinar:
Mil2Civ
Maintenance
Careers



Transitioning from Mil2Civ

The civilian VTOL industry offers a well of career opportunities for military vets.

TRANSITIONING TO A CIVILIAN JOB AFTER HAVING SERVED IN THE MILITARY can be confusing and intimidating. But with a little planning and preparation, qualified veterans can land secure, well-paying, rewarding jobs in the civil vertical takeoff and landing (VTOL) industry. For those interested in such a career change, here are five dos and don'ts to consider.

1 DO network, network, network. Networking is one of the most important career development skills for any professional, and that certainly applies to moving from the military to civilian sectors. Networking means talking to, getting to know, and getting to be known by people in your target industry. You can do this by attending events such as HAI HELI-EXPO®, staying connected with current and past fellow service members, and even cold-calling companies to learn more about their operations and how you can prepare for a position with them, as well as getting to know the people who'll make the hiring decisions. Whether you realize it or not, you also network in every interaction you have with anyone in the industry, even socially. Building a long list of contacts and having positive interactions with them will significantly increase your chances of landing a successful, rewarding civil career.

2 DON'T wait until you're out of the service to investigate a career change. It's never too soon to start researching your postmilitary career. There are a number of networking groups and seminars focused on helping service members make the transition to the civil VTOL industry; the [Mil2Civ Helicopter group on LinkedIn](#) is a great place to start. You'll receive guidance on creating a civil aviation resume, obtaining civilian licenses, speaking "civilian," and more. Use this time to also research potential employers and their requirements. If you do this work while you're still in the service, you'll have more time to prepare yourself with the right experience, licenses, and skills to land that first civil position.

3 DO learn from others who've gone before you. Former service members who are working in the civil industry are the best source of advice and support for making the transition to a postmilitary career. Ask them the important questions: How did you get your job? What was easy about the



process, what was hard, and what do you wish you had known before you started? Vets who've already navigated their mil2civ career transition can be a direct source of job advice, leads, or even offers. Learn how the civilian job you're seeking compares with its military counterpart and what you can do in advance to prepare for the position. Take to heart the advice and experience of those who've preceded you in this journey—it might very well ensure your future in the civil sector.

4 DON'T limit your options. While some types of work done in the military directly translate to civilian jobs, some skills may not, on the surface, look like they're marketable in the civil industry. Don't let that stop you. Combat field maintenance is exceptionally valuable to the utility operator with aircraft operating out of a base in the woods, for example. There are far more types of helicopter operations in the civil industry, all around the world, than in one branch of the military. Break your military job down into the skills you've developed and look for civil jobs that use those skills. You'll learn that you're far more marketable than you might have thought.

5 DO represent yourself positively and professionally. Service members have an edge in many job searches, coming from a military background that emphasizes respect for authority and following the rules. Take that professionalism to every exchange you have and every person you meet in the civil industry. You never know who'll reach out to offer you that next break. Always speak positively and respectfully about your job, your service, your experience, and your aircraft. Civil operators seek skilled team players with a positive attitude who'll respect the job, the customer, the procedures, and their authority while showing great care and respect for the aircraft and its limitations. Expressing those traits in every interaction leaves a lasting impression. 🌀

Thanks to Stacy Sheard, former HAI chair, and the panelists of the Feb. 18, 2021, HAI@Work webinar "Mil2Civ Transition: Finding a Job in the Civil Helicopter Industry." A military veteran herself, Sheard has worked to build HAI's Mil2Civ Transition program to help service members successfully transition to the civil market and to build support within the helicopter industry to hire veterans. Watch the full webinar at rotor.org/webinar to gain more valuable advice on how to transition to the civilian helicopter industry.

By Jen Boyer

HAI Training Working Group Members Mike Becker and Scott Boughton

It's not enough to tell pilots to avoid IIMC; let's tell them HOW.

AFTER THE HIGHLY PUBLICIZED CALABASAS accident in January 2020, the HAI Training Working Group focused its attention on what could be done to reduce or eliminate accidents due to inadvertent entry into instrument meteorological conditions (IIMC).

The working group quickly discovered that no single change would eliminate these accidents. But they agreed that training should be part of the solution. When pilots know the danger posed by flying into the clouds—and yet they still continue to do so—then awareness isn't the issue. They need better training in how to avoid making that often-fatal mistake.

Training Working Group members first decided to perform a comprehensive review of how IIMC avoidance is taught. They then developed materials that would fill in some knowledge gaps for pilots. The result: a series of white papers (see the box on p. 23) that lays the groundwork for new curriculum worldwide that will address the shortcomings in today's IIMC avoidance training.

ROTOR spoke with two members of the HAI Training Working Group about the project: Mike Becker, executive director of Becker Helicopter Services, and Scott Boughton, owner of Palisade Aviation.

How did this IIMC initiative get started?

Becker: When the HAI Training Working Group started looking at what got people into IIMC, we noticed people tend to focus on one little piece of the puzzle: the pilot needed more instrument currency or needed an instrument rating. The politicians were saying you must have terrain-avoidance technology. We decided to look at it holistically, because there's not any one thing that causes the problem, that leads pilots to think they have the ability to push a limit that far.

We started by looking at what pilots are trained to do now. We looked at what the visual meteorological conditions (VMC) rule sets were—not just in the FAA but at the European Union Aviation Safety Agency and Australia's Civil Aviation Safety Authority. We also looked at how each country folded the ICAO [International Civil Aviation Organization] recommendations into their rule set. It was quite interesting to discover there were differences.

We decided, first off, that HAI should recommend what a standard visual flight rules (VFR) set and what



Mike Becker



Scott Boughton

minimum VMC should look like in each airspace.

We came up with a 13-page document called *HAI VFR Best Practices*. It's not law. It's not a rule. It's a recommendation that encompasses those best practices for flying in VMC that we plucked from various countries. If you abide by these recommended best practices and apply the rules correctly, you should not get yourself into an IIMC event.

Now, this document required us to write some prescriptive minimums—we give a distance, a height, and a visibility. Looking at it holistically, we then looked at how a pilot interprets a prescriptive minimum. What does that look like in real life in flight? When the helicopter is flying 100 miles an hour at 500 ft. above the ground in deteriorating weather, how do you know you are 1 mile from the cloud when it's constantly changing?

So that led to our second document, *HAI Estimating Distance*. This paper offers hints, tips, and all the little tricks that experienced pilots have learned over the years on how to accurately measure a distance. Pilots can use this resource to enhance their ability to stay in VMC.

Those two documents then led to the quite-detailed last document: *HAI Decision-Making and IIMC*. Here, we go through the whole process of planning your flight and making the right decisions during the flight so you can avoid IIMC—because everything really is about avoidance and not getting anywhere near an IIMC event. I can't stress that enough: IIMC recovery skills must be taught, but I'd be quite happy if pilots made such good decisions that they never had to use them.

However, we do recognize that there are going to be some operations where the risk of flying inadvertently into the clouds is higher. So we also address in the paper the whole process of how you effect the recovery from IIMC back to VMC.

Are these resources aimed at a particular audience?

Becker: I hope people understand this is not a one-size-fits-all solution. IIMC is a really complex issue, and it doesn't have any one answer. We all fly different types of helicopters and different types of operations, in different operational contexts and in different environments.

But what we can do consistently across the board is conduct the basic training in how we plan and prepare, how we make decisions during a flight, and how we recover from an IIMC event. In these documents, I hope people find some real meat and potatoes, if you like, on how to do all those things within their operational context.

Boughton: I also would like to point out that in these documents, there's something for everyone. When I first looked at the drafts, I realized I'd never really thought about some of these things the way they're outlined in the papers, and I've been flying for almost 22 years.

While what's in these papers is valuable to new pilots, there's some in-depth information even the most experienced pilots among us would do well to review. Pilots are always learning, and if you're not, you need to question what you're doing. But after you've been out there making money with your aircraft for a number of years, it's easy to get lulled into a false sense of security.

There are some really basic things that people just stop thinking about after a certain point in their career, and that's a good time for everyone to go back to basics. It's one thing to tell someone the prescriptive minimum, but how do you really know the distance to that cloud? These documents give pilots really good tools to do that.

Learn to Avoid— or Survive— IIMC

EVERY PILOT LEARNS that IIMC is one of the top causes of fatal accidents. Yet, helicopter pilots still find themselves unintentionally in the clouds ... with, on average, only 56 seconds to live.

Operators, pilots, trainers, and safety professionals throughout the international helicopter community are urged to take advantage of these resources:

- **HAI VFR Best Practices:** provides recommended standards for maintaining helicopter flight safety under visual flight rules
- **HAI Estimating Distance:** supplies pilots with the tools to make informed judgments about distance and closure rates in order to maintain a minimum distance from clouds
- **HAI Decision-Making and IIMC:** covers the preparations required to avoid IMC, airborne decision-making, and recommended recovery procedures in the event that IMC is unavoidable.

These training materials, written by helicopter pilots for helicopter pilots, are available for FREE on the HAI website at rotor.org/education. Find more IIMC resources at ushst.org/56secs.



How can we get the most out of these resources?

Becker: In the first place, people should just read them, in order, for context, beginning with *VFR Best Practices*, then *Estimating Distance*, and finally, *Decision-Making and IIMC*. Knowledge is power. You may not yet necessarily know how to apply that knowledge, but you're taking some of that knowledge on board.

Next, these reference materials should become the basis of a 10-hour basic instrument course. I would prefer it to be part of a commercial rating course so that 10 hours of required instrument training is really targeted at all the issues we've discussed: planning and knowing how to stay in VMC, making good decisions to avoid IMC, and if necessary, recovering from IIMC.

I also hope operators choose to use these reference materials in their own internal training and procedures. So whatever role you have in the industry—pilot, operator, trainer—please download these papers, read them, and use them. 📄

ROTORCRAFT EVENTS

POSTPONED

The following event has been postponed through 2022 as a result of the COVID-19 pandemic:

Asian Business Aviation Conference & Exhibition (ABACE)

Originally scheduled for Apr. 12–14, 2022

National Business Aviation Association



**JAN. 19–20
Commercial UAV Expo Europe 2022**

Commercial UAV News
Amsterdam, Netherlands
Learn more at expouav.com/europe

**JAN. 25–27
Transformative Vertical Flight 2022**

Vertical Flight Society
San Jose, California, USA
Learn more at vtol.org

**FEB. 6–8
Geo Week**

Denver, Colorado, USA
Learn more at geo-week.com

**FEB. 15–17
International Military Helicopter 2022**

Defence IQ
Isleworth, England
Learn more at defenceiq.com/events

**MAR. 7–10
EXHIBITS OPEN MAR. 8–10
HAI HELI-EXPO 2022**



Helicopter Association International
Dallas, Texas, USA
Learn more at heliexpo.com

**MAR. 17–19
33rd Annual International Women in Aviation Conference**

Women in Aviation International
Nashville, Tennessee, USA
Learn more at wai.org/conference

**APR. 3–5
Army Aviation Mission Solutions Summit**

Army Aviation Association
Nashville, Tennessee, USA
Learn more at s7.goeshow.com

**APR. 5–10
SUN 'n FUN Aerospace Expo**

SUN 'n FUN Fly-In Inc.
Lakeland, Florida, USA
Learn more at flysnf.org

**APR. 23–24
HeliOffshore Conference and AGM 2022**

HeliOffshore
Cascais, Portugal
Learn more at helioffshore.org/event

**APR. 25–28
AUVSI Xponential 2022**

Association for Unmanned Vehicle Systems International
Orlando, Florida, USA
Learn more at auvsi.org/events

**MAY 10–12
Forum 78**

Vertical Flight Society
Fort Worth, Texas, USA
Learn more at vtol.org/forum

**MAY 23–25
2022 European Business Aviation Convention & Exhibition**

National Business Aviation Association and European Business Aviation Association
Geneva, Switzerland
Learn more at ebace.aero/2022

**JUL. 25–30
APSCON 2022**

Airborne Public Safety Association
Reno, Nevada, USA
Learn more at publicsafetyaviation.org

**JUL. 25–31
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Training the Modern Helicopter AMT



WATCH
SUU's Amanda Crager on
What It's Like
to Be an AMT

SUU provides helicopter focus and updated options for electronics, management skills.

By Jen Boyer

SOUTHERN UTAH UNIVERSITY (SUU) HAD a very real problem. One of the nation's largest university-based helicopter flight-training programs, the Cedar City, Utah-based school strained to attract and retain qualified airframe and powerplant (A&P) mechanics with helicopter experience.

"We struggled to bring in maintenance personnel because of our rural location," says Jared Britt, SUU's director of global aviation maintenance training. "Most of the time, we'd hire people with no helicopter experience, and they'd build experience on the job. Then they would leave us in two years.

"We realized we needed to control the type of education mechanics get so we could be sure they met our needs from Day 1. This meant they would also better meet the needs of the industry," Britt adds. "We basically developed a helicopter maintenance training program from our own necessity."

Having seen the university's investment in flight training pay off—SUU annually graduates at least 10% of all new rotary-wing pilots in the United States—SUU leadership gave its growing aviation department the green light to add aviation maintenance technician (AMT) training.

The university hired Britt in 2016 to research and develop the

program. With a deep background in helicopter maintenance and maintenance management, Britt saw the opportunity to do more than create the country's first university-based helicopter AMT training program. He wanted SUU to prepare graduates to meet both the changing needs of aviation maintenance and the demands of aviation leadership roles.

After almost three years of planning, curriculum development, hiring, and fundraising—all while creating industry partnerships to

effect a change in the regulations governing AMT schools—the SUU AMT Associate of Applied Science (AAS) degree program launched in January 2020.

The 63-credit degree program runs for an average of 18 months.

In addition to general education courses, the program includes a core AMT curriculum split into three sections: aviation generals, airframe, and powerplant courses.

Unlike many other AMT programs, the SUU degree puts considerable emphasis on rotorcraft maintenance. In addition to classroom work, students receive hands-on training on donated airframes and powerplants of both fixed- and rotary-wing aircraft. Additionally, one of the six required airframe courses is focused solely on helicopters, to give students an in-depth understanding of rotorcraft theory and aerodynamics, structures, main rotor systems, anti-torque rotor systems,

SUU annually graduates at least 10% of all new rotary-wing pilots in the United States.

flight controls, assembly and rigging, stabilization, vibration, blade tracking, and rotorcraft maintenance and inspection.

“It’s incredible to me that many new A&Ps come out of their programs licensed to work on helicopters but without ever having touched one. We thought it was important to expose students to rotorcraft from the beginning,” says Britt. “At SUU, helicopters are not an add-on but an essential part of maintenance education.”

Evolving Standards for AMT Education

SUU began to develop its AMT program just as the Aviation Technical Education Council (ATEC) and the industry were turning up the heat on the FAA to change the antiquated rules outlining the skills, hours of training, and topics that an AMT school must teach and that mechanic candidates must test for to receive their A&P license.

Not revised since 1962, these regulations are vastly out-of-date and offer very limited flexibility both in subject matter and how those subjects are taught. For example, under the current regulations, schools are required to teach wood and fabric repair techniques that are no longer performed in the industry while they must navigate the FAA bureaucracy to obtain permission to teach modern technology such as engine monitoring systems and avionics.

As he designed the new program for SUU, Britt saw an opportunity to help reshape US AMT training. He became an active member of ATEC and volunteered to chair the organization’s Legislative Committee, which includes members from AMT schools and the industry.

As part of that committee, Britt helped draft new language for 14 CFR Part 147, the regulations governing AMT education, and airman certification standards (ACS) for mechanics. The goal is to enact new regulations that will permit greater flexibility in how and what AMT schools teach, allowing them to better create the workforce the industry desperately needs to compete and grow. The final language was included in the Consolidated Appropriations Act, 2021, which was signed into law in December 2020. The FAA is expected to update Part 147 with language from the new law this year (see “Revising Part 147: The Saga Continues,” on p. 30).

Knowing the new regulation was coming, Britt and the SUU team designed the school’s AMT program to meet the requirements of both the current and anticipated future rules.

“While we wait for the new rules to publish, we still have to teach what’s required in the current rules,” Britt says. “We approached this progressively, covering the letter of the current rule and expanding on it with modern technology and helicopter systems that are supported in the new rules.

SUU AMT students receive instruction on how to safely hoist an engine out of an airframe.



When the rules change, there are some things we'll be able to drop because they are either antiquated or redundant. We want to focus on advanced technology, spending more time on composites, advanced wiring and electronics, and turbine engines. These are the skills the industry is demanding in its AMTs today."

Training AMTs for Leadership

In creating the SUU AMT AAS degree program, Britt took advantage of the university's resources to go beyond the basics of the Part 147 mandates. Electronics courses, for instance, are taught by the SUU engineering department, providing students with the opportunity to connect with their STEM peers while sharing instructors and equipment.

The university also partnered with Southwest Technical College, a few blocks from SUU's main campus, to share resources and equipment for classes on structures and advanced electrical wiring. Hands-on maintenance training takes place at Cedar City Regional Airport (KCDC), where under the watchful eye of instructors and licensed A&P mechanics, students work on the university's aircraft fleet of 19 piston helicopters, 5 turbine helicopters, and 16 piston airplanes.

The program is also designed to prepare students for future advancement. "As we began developing the program, we wanted to build in options for mechanics to have upward mobility in their careers," Britt says. "There isn't just a deficit in mechanics. There is a very

real deficit in aviation leadership as those current professionals begin to retire.

"I've seen it have a very negative effect on aviation operations. Operators will promote their best mechanic to director of operations, but that person often does not have the education or experience in business skills, logistics, and big-picture understanding of aviation business management to do the job effectively. Sometimes that can lead to financial failure," he says. "Our goal was to develop pathways that not only allow mechanics to effectively maintain today's and tomorrow's aircraft but also to move up in their careers successfully."

In September 2021, SUU launched a bachelor's degree in aviation administration and leadership. Students in both flight and

Revising Part 147: The Saga Continues

Originally established under the Civil Aeronautics Administration, the precursor to the FAA, 14 CFR Part 147 defines the requirements and operating rules for FAA-certificated AMT schools. In other words, it defines the skills that an A&P candidate must learn, who can provide that training, and how that training should be provided.

Last updated in 1962, these regulations continue to mandate that A&P students learn outdated technologies while others that were in their infancy or nonexistent in 1962, such as health and usage monitoring systems, are not covered. Schools must work through a cumbersome FAA approval process to modify either the curriculum or their operating procedures.

In 2009, an industry working group, the Part 147 Aviation Maintenance Technician Schools Curriculum and Operating Requirements Working Group, formally recommended broad changes to Part 147 to better align with modern technology and industry needs. In response, the FAA issued in November 2015 a notice of proposed rulemaking (NPRM) with sweeping changes to Part 147. The industry strongly objected to the new language, arguing that the US Department of Education should oversee AMT training and that oversight by the FAA has led to excessive roadblocks to curriculum updates.

In the FAA Reauthorization Act of 2018, Congress mandated the FAA to release a new Part 147 by April 5, 2019. Eleven days after this deadline, the FAA released a supplemental NPRM for Part 147, which received substantial

criticism from the industry. Instead of streamlining the regulations for AMT education, the supplemental NPRM doubled the size of Part 147, requiring AMT educators to submit to additional layers of regulations and approvals.

With AMT shortages reaching a critical level, the industry petitioned congressional legislators to draft new language for Part 147 that would reference the revised mechanic airman certification standards (ACS) being developed by an FAA-industry working group. That language was included in the Consolidated Appropriations Act, 2021, signed into law by President Trump in December 2020. The act called for the FAA to replace current training requirements with the new language within 90 days, a deadline that has come and gone with no action.

On Sep. 1, 2021, a bipartisan group of seven senators [sent a letter](#) to US Transportation Secretary Pete Buttigieg and FAA Administrator Steve Dickson saying that "it is imperative that Part 147 rulemaking remains a top priority for the FAA" and asking for immediate publication of the mechanic ACS.

The Department of Transportation regulatory agenda states that the rule was supposed to be published in November. At press time in mid-December, the industry was still anxiously awaiting action by the FAA and had reengaged with legislators on the issue.

For more on the industry's efforts to revise Part 147, see "[Is AMT Education Ready for the 21st Century?](#)" in the 2020 Q4 issue of ROTOR, or visit the ATEC website for [updates and the text of the new Part 147 and mechanic ACS](#).



maintenance programs can take courses in business as well as aviation management and administration to develop their leadership skills and management knowledge.

The degree can be pursued as an extension of the AMT AAS degree or by current AMTs with an associate degree. To better support working AMTs, the bachelor's degree program is offered online.

Working with Strategic Partners

Britt credits SUU's success in developing and launching a unique AMT program—despite the additional complications of debuting an educational program just as COVID-19 was about to spread throughout the world—to the university's multiple partnerships across industry and government. It worked closely with aircraft operators who sought better-trained AMTs, associations like ATEC and HAI, and government entities, including the FAA and the state of Utah.

Staffing shortages at the local Salt Lake City Flight Standards District Office (FSDO) led to oversight of the development of the new SUU program being transferred to the San Diego (California) FSDO. That FSDO had more recent experience supporting AMT program development and thus was open to working with SUU to make changes to AMT education

while also remaining compliant with 14 CFR Part 147. Britt also credits that FSDO with helping SUU pivot quickly to presenting some courses online during the pandemic.

SUU also approached the state of Utah to obtain financial support for its expansion of AMT education. To attract more technical industry and skilled jobs, the Utah Governor's Office of Economic Opportunity in 2014 launched Talent Ready Utah, a workforce development program that provides state residents with exposure to careers in aerospace and defense as well as other targeted industries.

SUU was successful in securing a Learn & Work in Utah grant that covered the first semester's tuition for 14 students. It also won a Perkins grant, a federal program that supports career and technical education, to purchase equipment and supplies as well as to support a future avionics emphasis in the degree program.

SUU also joined HAI in initiating the Utah Rotor Pathways Program (URPP)—a multilevel effort by state government, industry, and educators to develop a skilled workforce for the rotorcraft industry in Utah. In 2021, the university received a perpetual Strategic Workforce Initiative grant from the state, worth \$320,000 a year, to help run the AMT AAS degree program, add a professor, and develop additional

The new AMT school complements and closely works in conjunction with SUU's successful flight training department.

curricula. The grant also supports SUU's work on behalf of URPP to offer college-credit courses in helicopter flight and maintenance in 18 Utah high schools, with the hopes of sparking interest in aviation careers.

Today, the SUU AMT program is supported by four maintenance instructors, supplemented by two flight school instructors who also have A&P licenses. Department leaders had hoped the student population of the program would be 125 by now, but COVID and resulting housing shortages have kept that number to 70. Britt hopes to see enrollment increase by 40 to 50 students a semester in coming years until the program is fully enrolled at 250 students.

Making a Difference

Interviews with some SUU AMT students illustrate how the new program is preparing them for aviation careers.

Hands-On Learning

Josh Snyder enrolled in SUU's fixed-wing flight-training program in 2019 after graduating from the Academy of Aviation at Rancho High School in Las Vegas, Nevada. To help cover his costs, he landed a hydropress operator job at Metalcraft Technologies, just down the street from campus. A few months into flight training, Snyder decided to move

his studies to the new SUU AMT program. He joined the program in January 2020 and hasn't looked back.

"I love working on cars and my truck, doing things with my hands, and this program has been amazing," Snyder says. "I love it, especially how hands-on it is. I talk with my friends in other A&P programs, and they're spending far more time in lectures and supervised studying while we're spending time in the lab, actually touching things and working with our hands. It's also really helped me out with my job at Metalcraft, especially the precision measuring equipment, bend angles, bend radius, things like that."

Snyder's managers have noticed his commitment and are closely watching his progress toward his A&P certificate. He is being considered for an entry-level A&P position at SyberJet Aircraft, which, like Metalcraft Technologies, is a subsidiary of MSC Aerospace and has an operation in Cedar City.

Learning Marketable Skills

After five years serving in the US Marines as a powerplant mechanic, Joe Campanile used his veteran's benefits to enroll in SUU's helicopter flight-training program in 2018. As he completed the program and received his rotorcraft commercial, instrument, flight instructor, and instrument instructor ratings, SUU's AMT program was launching. Campanile was one of the first students to enroll.

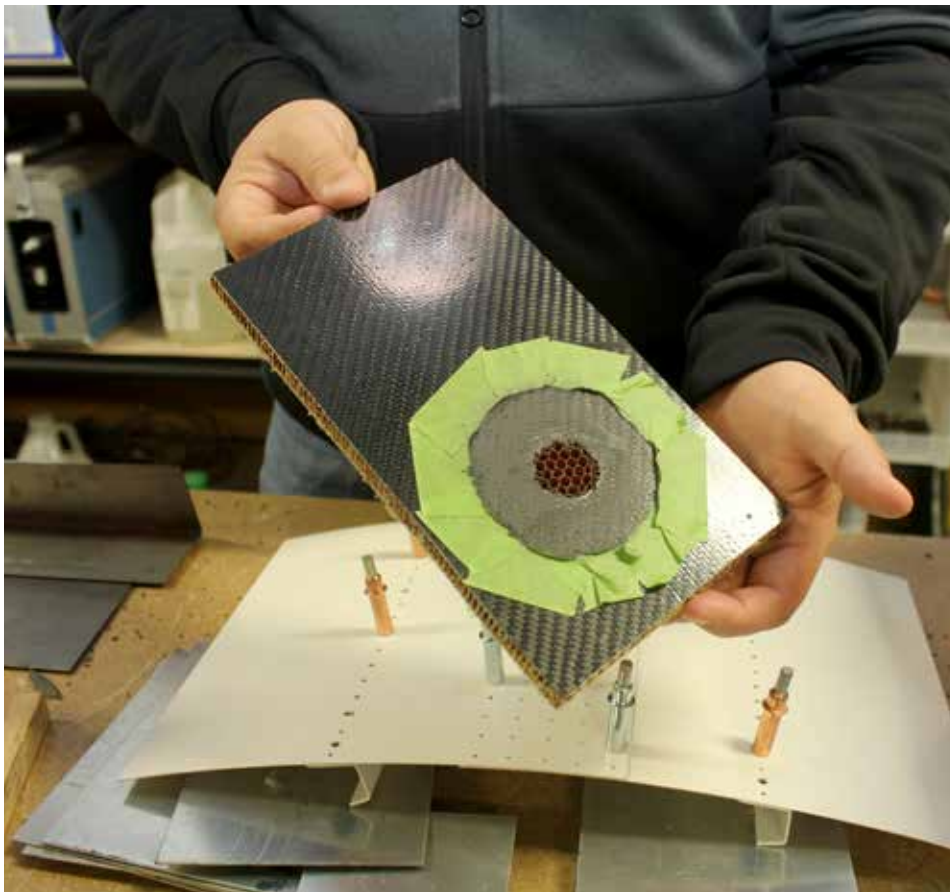
"I want to work in an area where I can use both my pilot and mechanic skills," he explains. "I really want a routine schedule, and maintenance is more scheduled. Having both skills, I'll be more marketable for something stable and predictable like helicopter EMS [emergency medical services], which allows me to be in one place and have a family."

Having been in the program from the beginning, Campanile experienced the department's growing pains, which were exacerbated by the pandemic. "The flight program had been around a long time, so it was very structured," he says. "Going from that to a new program starting out, we just had to be a little more patient." He adds that he's enjoyed the small class size that allows him to work closely with instructors and classmates.

Supportive Environment

Bridget Wolf has found the SUU AMT program to be exactly what she needed. She graduated from high school in 2019 and initially enrolled in the flight-training program to be an airplane pilot. A few hours of flight

Students in SUU's AMT program receive instruction in modern repair techniques, including carbon-fiber repairs.





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time taught her that she wanted to know more about how aircraft worked.

Wolf joined SUU's AMT program in the summer of 2021. Now in her second semester, she is happy with her decision.

"I really like it here, and I love what I'm learning," she says. "It gives me a different point of view versus what I was seeing as a pilot. And I'm really fascinated with helicopters now. I plan on working in helicopter maintenance at least for a few years. Maybe I'll go back to flight school. My dream job is to be a helicopter pilot."

In addition to what she's learning, Wolf is equally impressed by the culture at SUU. A young female in a traditionally male-dominated field, she knew she could face feeling like an outsider. That hasn't been the case at all.

"It feels more like a family here than school," she explains. "A lot of my fellow students are veterans. They have a lot of experience and have been out of high school longer than me. They help each other out and help me."

"We all meet for study groups. Everyone treats each other the same, even the instructors, regardless of how much aviation or even life

experiences we have," Wolf adds.

Like many other women entering aviation, Wolf has also found valuable networking and support services through Women in Aviation International (WAI). The local chapter, the SSU T-Birds, provides study groups for both flight and maintenance students.

Planning for Growth

In addition to adding the bachelor's degree in aviation administration and leadership, SUU is working to expand its offerings for AMTs in two additional areas.

SUU's aviation and engineering departments are working together to create an avionics and electronics emphasis for the AMT program. Expected to be launched in the spring of 2023, this emphasis will work much like the airframe and powerplant emphases, running as a two-semester cluster of courses that prepares mechanics to receive their license to maintain and repair specialized avionics and electronics systems.

"We heard from industry partners that as aviation moves toward a more digitized and electronic age, the demand for mechanics who

can perform and sign off on their own avionics work grows," Britt says. "By providing our students with a choice of emphases in their program, we help them specialize and become highly marketable."

"Our avionics emphasis is unique, as it's tied to our engineering department. Several of the courses are advanced electrical engineering, which gives students a more solid understanding of circuitry and electrical systems," he adds. "Teaching avionics and advanced electronics together provides a more valuable foundation for today's advanced aviation systems."

SUU has also begun to develop an advanced manufacturing emphasis, which will focus on composites. The school is in the process of designing the curriculum and planning for equipment acquisition, including an autoclave, to support this emphasis.

Future students in SUU's AMT associate's program will be able to pair any of these emphases to their airframe licenses during the 18-month program. Current A&P mechanics can also enroll for two semesters per emphasis to earn additional aviation maintenance licenses. 📍



SUU has been fortunate to receive a number of airframe donations, allowing the program to provide rounded instruction in helicopter maintenance.

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A Cargo Drone Is Inbound

By David Hughes

THE INTEGRATION OF UNMANNED AIRCRAFT systems (UASs) into the airspace—and, just like the Amazon van, into the routine of daily life—has taken another step forward. Drone Delivery Canada (DDC), a small public company with a market capitalization of C\$181 million, has earned the first Compliant UAV Operator Special Flight Operations Certificate from Transport Canada. The designation entitles the company to conduct beyond-visual-line-of-sight (BVLOS) operations.

DDC has developed three UAS models. The largest is the autonomous, gasoline-powered Condor cargo drone, which weighs 1,050 lb. and can carry a 400-lb. payload. It can fly at speeds up to 75 miles per hour, with a range of up to 125 miles. The Condor is undergoing extensive flight testing in preparation for its first commercial use, and DDC has preorders for it.

The company's smallest UAS, the 55-lb., eight-rotor Sparrow, can carry a 9-lb. load up to 18 miles at speeds up to 50 miles per hour. It is already in commercial service. Development and testing of the 176-lb., eight-rotor Robin XL has been put on hold while the company completes testing of the new parachute-equipped version of the Sparrow (named the Canary) and the Condor. Both the Sparrow and Robin XL are powered by lithium-ion batteries.

FLYTE Logistics

Even though DDC has developed three drones, the core of its product line is a logistics hub, of which its drone fleet is only one component. That hub, the company's patented FLYTE software platform, monitors air traffic, weather, obstacles, and other key flight parameters for its deliveries.

More than just an automated flight-tracking program, the



Canadian company provides autonomous BVLOS deliveries to remote communities.

cloud-based FLYTE platform also tracks all logistics related to the flight and cargo. It schedules deliveries, monitors shipments and waybills, tracks temperatures for sensitive cargo, runs maintenance logs, and can be integrated into a customer's logistics software. The software is airframe agnostic and can be used with both crewed and uncrewed aircraft, including helicopters and UASs.

DDC monitors the drones from its NASA-like, 24/7 drone operational control center in Vaughan, Ontario, just north of Toronto. DDC owns the drones and infrastructure while providing FLYTE as a turnkey system that is sold as a managed service to customers. FLYTE has half a dozen customers so far and has been earning revenue for a year.

"FLYTE runs automatically, and we just monitor it," says DDC President and CEO Michael Zahra, whose resume

includes a bachelor's degree in electrical engineering and a master's degree in business administration. He also has 30 years of experience leading the Canadian operations of several companies, including Staples Business Advantage, Yahoo, and Schlumberger.

Drone Operations

DDC drones operate autonomously on fixed routes to specific sites. Detect-and-avoid capability is provided at the drone landing sites by ground-based radar systems with about a 12-mile range. A human operator is alerted to take control if a conflict develops with other traffic. Meanwhile, DDC is developing a proprietary detect-and-avoid system.

"Today, there is really not a robust, inexpensive, lightweight, and proven detect-and-avoid system for onboard use for a drone like the Condor," says Zahra. He notes that sensors that can spot an aircraft out to about 1.2 miles away don't provide enough warning to avoid a fast-moving aircraft.

Other companies are working on onboard acoustic sensors, cameras, and radar, but Zahra doesn't think these third-party solutions are sufficient. "You need to detect aircraft 10 miles or more away, and that tends to be a bit larger, heavier, and more expensive system, and that's what we're working on right now."

The Sparrow and Robin XL are designed to fly into a boxlike structure or "drone spot" that the company places at departure and destination sites. The drones transition from GPS-guided navigation to optical guidance by locking onto a marker that looks like a bar code on the floor of the drone spot. The onboard optical sensor then allows the drone to make a precise landing without hitting any of the walls of the containerlike landing spot.

"We lock onto the bar code, and it's a more secure way to land," says Zahra.

The drone landing site is secure. Access is monitored by cameras, and the area is fenced to keep people and wild animals out. While people load and unload cargo in the drone spot, computers check the battery charge of the drone and monitor the weather. Bar-code scanners track packages being loaded onto or unloaded from the aircraft. The drone spot can even have a retractable roof, depending on customer requirements for high-value cargo.

"Our approach is to augment traditional cargo transportation where it makes more sense because of cost effectiveness and availability," says Zahra, adding that his company's drones can launch quickly, with no need to schedule a pilot. The company is in talks with oil-and-gas companies, mine operators, and large helicopter companies about using its logistics system and drones.

"Helicopter companies understand that we're going to compete with them. Some realize they'll be better off working



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The Sparrow battery-powered drone operates on preprogrammed routes to and from drone spots such as this fenced-in area. It can carry up to 9-lb. payloads at speeds up to 50 miles per hour. The company's logistics system tracks all packages. A Sparrow is now operating on a short route from Edmonton International Airport (CYEG).

with us instead of only seeing us as a competitor," Zahra says. "So if you're sending a helicopter and a pilot to do a delivery where you could have sent a drone, that's a cost savings that could have been passed on to a mining, oil, or gas customer. If helicopter company A isn't going to work with us, I guarantee you that helicopter company B will."

The Condor

DDC bought a shell airframe and motor for the Condor, while all of the electronics and software were developed in-house. To resolve concerns about the availability of aviation fuel in remote locations, the Condor uses automotive gasoline, and the choice of a piston engine means the powerplant is simple, reliable, and inexpensive to maintain.

The choice of a gasoline-powered engine for the Condor was a simple decision. "When we started working on the Condor a few years ago, there really wasn't any battery or hydrogen fuel cell technology that was going to give us the range and payload capacity we needed," says Zahra.

The Condor landing zone will be fenced to keep people and wild animals out of the area,

but the cargo drone may land following a glide path rather than a direct vertical descent. And, just as with the Sparrow and Robin drones, it will use the FLYTE system to monitor loading and unloading.

Condor flight testing has included checkout of the aircraft's triple-redundant autopilot system. Its communications system, also triple redundant, uses satellite, cellular, and radio systems. DDC engineers have also tested the Condor's general flight stability and performance, autonomy and autonomous waypoint navigation, fuel consumption in multiple flight patterns, velocity vectors, and altitude profiles. There has also been extended endurance testing for various environments.

Three Condor drones are flying, and one is being prepared for use in initial commercial service. The Condor's first contract will be for deliveries to several communities on the North Shore of the Gulf of Saint Lawrence in Quebec, about 1,000 miles northwest of Montreal. A 10-year agreement with Drones Express of Quebec will enable BVLOS deliveries of parcels and mail to these communities. The drones will also serve the nearby, 3,000-square-mile Anticosti Island, where about 200 people live.

An advertisement for QFT Quality Fuel Trailer & Tank. It features a white fuel trailer with a red tank and a red fire extinguisher. The text reads "QFT | QUALITY FUEL TRAILER & TANK" and includes the phone number "(425) 526-7566".

An advertisement for HeliTooling.com and HeliLadder.com. It features a yellow multi-engine sling. The text reads "THE NEW MULTI-ENGINE SLING PW200, TURBOMEGA ARRIEL, HTS900" and includes the website addresses "HeliTooling.com | HeliLadder.com".



The 1,050-lb., gasoline-powered Condor drone can carry a payload of 400 lb. 125 miles at 75 miles per hour on preprogrammed routes to specific drone spots.

Future Projects

DDC has been working with Transport Canada on other projects, including approvals for BVLOS operations in remote regions. Earlier this year, the company was selected to be a member of the Canadian Drone Advisory Committee, represented by its VP of regulatory affairs, Mark Wuennenberg. A pilot who served 33 years with the Royal Canadian Air Force, Wuennenberg also worked on many UAS initiatives at Transport Canada and helped develop the agency's UAS regulatory framework.

One project DDC is developing is defined-route drone deliveries from Edmonton International Airport (CYEG) to the Nisku Industrial Park 2.4 miles away. DDC is partnering with the airport, Air Canada Cargo, Toronto-based Apple Express Courier, and Zing Final Mile to provide deliveries using DDC aircraft and drone zones. The Sparrow completed its first flight from CYEG on Dec. 3 under Nav Canada approval, with other routes to be added later along with flights by the Robin XL and the Condor.


DDC is also working on several projects involving Sparrow drones to carry cargo to remote First Nation communities in Canada, many of which have been in lockdown to reduce COVID-19 transmission. The autonomous deliveries have proven to be particularly valuable for isolated communities that need health-care supplies during the pandemic, as the deliveries involve no person-to-person contact.

Sparrow drone flights have, for example, started between the Village of Fraser Lake and the Stelat'en First Nation, about 2.4 miles away. This contract was signed with the University of British Columbia (UBC) and the Stelat'en First Nation as part of UBC's remote community initiative. With the ongoing COVID-19 pandemic, drone deliveries "will help address inequities in the access to health-care supplies and services," says Dr. Michael Allard, vice dean of health engagement on the UBC Faculty of Medicine.

In another project, DDC is working with the University of Toronto Institute for Aerospace Studies and Ford Motor Co. to test an autonomous drone's ability to track and land on a moving vehicle.

The goal is to achieve repeated landings on a moving vehicle while maintaining the drone's position relative to the vehicle to within about 4 in.—even as the vehicle changes speeds.

DDC is also exploring military and security applications for its drones and logistics services.

In August, the company signed a two-year agreement with Nexeya Canada (a Hensoldt company) to jointly explore developing products for civil and military use. Hensoldt provides systems and sensors for air, land, and sea platforms for military and security missions including helicopters, fixed-wing aircraft, UASs, ships, submarines, armored vehicles, and satellites. 

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High Wire





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A PHOTO ESSAY BY MARK BENNETT



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Most work done by helicopter crews starts early. This day would be no different, so the crew begins assembling at the hangar an hour before the sun will scale the heights of the Los Pinos Mountains, east of Belen, New Mexico. Their mission that day: string 345 kV conductors and static lines through 8 of nearly 800 newly built towers.



WATCH
Wilson Construction Crews
Install a Power Line in Oregon



What's Up with Transmission Lines?

The cables that carry high-voltage electricity over long distances are called transmission lines. They require very good insulation to prevent electricity from arcing to a nearby object, like a tree or building, or to the ground. Because air is actually a good insulator, most utilities string the lines from tall towers, which typically range from 49 to 180 ft. in height.

What a utility needs, then, is a tool that can carry workers and materials efficiently over distances both vertical and horizontal. On some days, the job is to transport a crew some miles to a remote location. On others, it is to move as little as possible, holding a precise hover close to wires carrying as much as 800,000 volts while a power-line technician completes a task.

Above: For some segments of the project, Rotor Blade was able to keep its helicopters hangared at the Belen Regional Airport (KBRG), a welcome amenity not always available to aircraft working many miles from any facilities.

Right: An MD Helicopters MD 500E heads to its landing zone before the sun is up, ready for a full day of lines, line workers, and tools.

Previous spread: Darin Sturdevant, piloting a Wilson Construction MD 530F, surveys a segment of the 500 kV circuits running between Hesperia, California, and Laughlin, Nevada. Photographer Mark Bennett is just visible in the skid-mounted mirror, which also provides Sturdevant with a way to verify that the aircraft's human external cargo line is securely attached to the belly of the aircraft.





Cue the Helicopters!

Almost anything a helicopter can do for transmission lines, a truck, crane, or even a line worker can accomplish. But efficiently? That's where the helicopter comes in ahead.

Phillip Smith, chief pilot with Rotor Power, puts it this way: "A helicopter can pull the pilot rope through eight towers in less time than it took to set up the bucket truck that initially offered the rope to the helicopter's grapple." If done by trucks alone, stringing that rope requires multiple people and time-consuming setups at each and every tower.

The speed and efficiency of helicopters, compared with ground-based operations, reduce the hours spent by workers as well as their accompanying risk. And when a project is slated for a precarious or sensitive environment—across a gorge or through a fragile desert ecosystem—using aircraft reduces the impact of ground access to the site, resulting in both economic and environmental wins.

Above: Near Belen, New Mexico, an MD Helicopters MD 500E operated by Rotor Power pulls a pilot rope through the outboard stringing blocks in a line of transmission towers.

Right: To pull the pilot rope through the stringing block suspended from the crossarm *between* the poles, the same helicopter must thread the rope in a multistep process with a long tool called a needle, the yellow device dangling from the crossarm.









Above: East of Apple Valley, California, Wilson Construction's Jay Clark (center, in orange) addresses the crew during the briefing, known as a tailboard, that opens each workday. How the team will coordinate to ensure safety that day is always on the agenda.

Left: A Wilson Construction MD Helicopters MD 530F deposits a line worker to a "goat's horn" on a transmission tower east of Apple Valley to replace a static line.



Up, Up, and Away!

Pilots thread rope through stringing blocks without the need for people on the towers, a delicate dance between agility and stability. But much work still needs to be done by hand on those towers, and there's no faster elevator than a helicopter, up or down.

Helicopters position workers at or on the lines to make repairs, install spacers, or add devices to minimize the effects of wind, snow, and even noise. In some locations, they install devices to ward off birds or even bigger "birds": aircraft.

According to Wilson Construction production pilot Darin Sturdevant, the pilot's goal is to get the line technician "into the most comfortable position, which lets them work more quickly and efficiently. You are literally adjusting their position by inches."

And whether heading up or down, workers get a ride like no other, sometimes suspended 75 ft. below the aircraft.



Looking for Trouble

Another key task for utility workers is to inspect the towers and lines for issues requiring maintenance, and to protect them from environmental damage. Inspections can be done with bare eyeballs but are increasingly accomplished with cameras and specialized optical sensors carried by both crewed and uncrewed aircraft. As unmanned aircraft systems (UAS) receive approval for more types of operations, however, especially those beyond visual line of sight, industry observers expect uncrewed aircraft will perform the bulk of inspections.



Above: A Bell 429 belonging to Salt River Project carries inspector Mike Deubler as he examines the utility's transmission towers and lines supplying power to much of central Arizona.

Left: Strings of insulators, brought down from transmission lines damaged in Puerto Rico by Hurricane Maria, lie in a middle school's ball field where an MD 530F operated by Northwest Helicopters awaits its next turn at carrying workers and gear to the nearby towers. Repairing storm damage is a common job for utility operators.

Right: A Wilson Construction MD 530F suspends a crew as they install an aerial marker ball in Ontario, California.





Above: An MD 500D operated by Aerial Solutions trims back the forest near Toccoa, Georgia.

Right: Outside Clarkesville, Georgia, an MD 500D operated by Rotor Blade trims a power-line right-of-way.

One constant maintenance activity is vegetation management. Where trees border the right-of-way surrounding power lines, their growth, both horizontal and vertical, must be monitored and, when necessary, contained.

Once again, helicopters are uniquely efficient at the task. Aerial saws have a fearsome look and a tree-trimming ability to match. Twenty-seven feet of spinning blades, slung on a 90-ft.-long combination cable and flexible conduit providing directional control, make quick work of errant limbs. For the too-tall trees, “topping” saws cut through the trunk and direct the falling timber away from the lines.

Providing an Essential Service

The world is increasingly interconnected, and much of that connectivity is powered by electricity. Coupled with a growing reliance on renewable energy and the move toward electric vehicles (cars and aircraft alike), this means the need for electric power keeps growing. The market for helicopter services to keep that power up and running is growing too.

Perhaps no other sector of helicopter operations affects so many people in so many ways, minute by minute. When our power is on, we tend not to give it much thought. When it isn't ... we struggle.

Some helicopter industry sectors, such as law enforcement or air ambulance, are acknowledged as serving society. Let's add utility operations to that list. [R](#)





QUICK FACTS

Francisco Beltran

Government of
Córdoba Province, Argentina
Córdoba, Argentina

CURRENT JOB

I'm currently working as a helicopter commander and Learjet 60XR copilot for the government of Córdoba, the second-largest province of Argentina. We perform a variety of operations, such as firefighting, air ambulance services, power-line inspections, VIP transport, and more. My key responsibility is to ensure a safe and efficient operation.

FIRST AVIATION JOB

My first aviation job was in a relatively small company that did aerial photography and filming (when no gyro-stabilized cameras existed), agricultural flights, and radio coverage of sporting events such as the Word Rally Championship. We flew the R22 and R44.

FAVORITE HELICOPTER

I think the best helicopter is the one that provides you work in this awesome industry. Also, I believe all helicopters have something to give us or teach us, but the power of the H125 IS AMAZING!

How did you decide helicopter aviation was the career for you?

The ability to land or operate almost anywhere, in addition to the wide variety of jobs we can perform while also helping others, is quite stunning. I can be sure that every day I spend flying these fantastic machines, I fall more and more in love with this career.

How did you get to your present position?

I started flying gliders at the age of 15, then transitioned to airplanes. While towing gliders and doing some other flights, I got my commercial certificate. Meanwhile, I started helping out at a small company, cleaning helicopters, trying to understand how rotorcraft fly. I spent hours reading the checklists while seated inside the helicopter, practicing [aerial] movements, noting where the instruments were and how I had to move the controls, and so on. Then, after some time, I started flying helicopters, and the company decided to hire me, a low-time pilot! I could never be too grateful for the opportunity and the trust they had in me.

What are your career goals?

I'd like to work abroad. That's why I got my FAA certificate, and now I'm working on my EASA license. Working in the offshore industry in the North Sea would be great!

What advice would you give someone pursuing your path?

NEVER, EVER GIVE UP! If it's your dream, go for it. Never stop studying, learning, listening to experienced pilots, and being humble. Everything comes sooner or later, so be patient and work hard.



Who inspires or has inspired you?

My first boss in the helicopter industry, with his modesty, professionalism, always helping others improve their skills. My parents and their core values were, without a doubt, also an inspiration. My mother is finishing her law studies and carries a high grade-point average. She exemplifies what it means to be a hard worker, humble, persistent, and an excellent human being.

Tell us about your most memorable helicopter ride.

After 12 years flying helicopters, it's difficult to choose just one memorable ride. But in my current job, we perform air ambulance and firefighting flights, and every time I return to the base after a successful mission, the feeling I have is indescribable.

What still excites you about helicopter aviation?

What I like most is the fact that every day, every mission, is completely different. From

the performance perspective (a mountain rescue) to the job to be done (fighting wildfires or conducting humanitarian flights), you have to be ready for a new challenge every single day.

What I like most about helicopter aviation is that every day, every mission, is completely different. You have to be ready for a new challenge every single day.

What challenges you about helicopter aviation?

I'd like to be more proactive when it comes to accident prevention, figuring out how to collaborate to mitigate

human factors as much as possible. I'm planning to become a human factors facilitator. For a while now, I've been feeling the need to return at least just a little bit of all the industry has given me. As a flight instructor (for helicopters, airplanes, and gliders), I always try my best.

What do you think poses the biggest threat to the helicopter industry?

I think it's getting harder to find qualified and trained pilots. The high cost of training has left some pilots out of the game. And there's a wide gray area in which low-time pilots lack the requirements to transition to other jobs.

Complete this sentence: I know I picked the right career when ...

... I go to work, and it doesn't feel like work! I wouldn't trade my job for anything! 🇺🇸

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Jessica Meiris, Recipient of the HAI Michelle North Scholarship for Safety

“Backup career” leads entrepreneurial pilot to start her own helicopter flight instruction and operations company.

GROWING UP IN COLORADO Springs, Colorado, Jessica Meiris enjoyed mountain biking and rock climbing. She loved climbing so much, in fact, that she later worked as a mountain guide for more than 15 years. But as she entered her late 30s, she knew that, despite her love for her job, she physically wouldn't be able to remain a guide forever. So she decided she needed a backup career.

Little did she know that a devastating accident would simultaneously lead her to her first encounter with a helicopter, end her job search—and change her life forever.

One day in 2010, Jessica and her then-boyfriend, Buster Jesik, were on a climb in Red Rock Canyon National Conservation Area in Nevada when he fell from about 50 ft.

“As a mountain guide, I had medical training, and I thought he might have injured his back and head,” recalls Jessica.

She flagged down a couple of climbers, who called 911. Within 30 minutes, she could hear a helicopter approaching to take Jesik to the hospital.

While Jessica was focused on getting Jesik to safety, she couldn't help but notice all the helicopter's cool capabilities from the moment it landed. She remembers the severity of the situation, of course, but also recalls grinning while getting her first helicopter ride that day.

“I was amazed,” says Jessica. “We

were in a tight canyon that had no place to land, so the pilot balanced one skid on a rock when we loaded into the aircraft. It was so impressive—from the maneuverability of the machine to the skill of the pilot



and the coordination of the rescue. And [the crew] got there quickly and safely.”

Her Next Role

Jessica says that during the helicopter ride, she made a mental note to investigate a career in rotorcraft after the emergency was over. When the time came to begin looking for a new profession four years later, she began researching all the fields she was interested in, placing helicopter work high on her list, for many reasons. For one, she wanted to remain working in the mountains. For another, she sought to give back to climbing. Jessica also wanted a job that was physically relatively easy but mentally stimulating.

“I'm not one of those people who wanted to fly since I was 6 and suddenly achieved my dreams,” says Jessica. “Most of the decisions I make in my life are practical and well thought out, and this is one of them. I knew I needed a backup career, and this was the best fit for me.”

In 2018, Jessica joined HAI and quickly began taking advantage of all the resources the association offers its members and the aviation community at large. That same year, Jessica attended her very first HAI HELI-EXPO® and has been to every one since.

One of the most essential opportunities Expo offers, Jessica says, is the chance to network with other industry professionals. “I can't empha-

size enough the importance of networking in this small industry,” she says. “Networking is everything, and I've gained so much knowledge and so many connections and have had great conversations at the show. And it's fun to be around helicopters for a few days.”

Jessica says Expo is also a great place to meet up with friends and other aviation pros she already knows, including members of Whirly-Girls and the US Helicopter Safety Team, two nonprofit organizations for which she volunteers.

Jessica started flight school in September 2018 and finished in March 2020. After receiving her private, instrument, commercial, CFI, and CFII ratings,

she briefly worked at a flight school but quickly realized the environment wasn't the best fit for her. So she decided to start her own helicopter company, V3 Initiative LLC. Based in Colorado Springs, V3 offers independent flight instruction, helicopter ferry services, and scenic tours.

By choosing a nontraditional path early in her career, Jessica says she depended on and collaborated with other pilots who were on a similar trajectory; namely, Gary Cleveland with Cleveland Helicopter Services and Matt Goodrich, an entrepreneur with whom she launched a scenic tour company during the COVID-19 pandemic. This type of collaboration, she says, "is critical to success in the industry."

Jessica is committed to inspiring her fellow aviators as well as those interested in entering the industry like she did three years ago. The V3 in the company's moniker, which stands for Vision, Vulnerability, and Voice, reflects its proprietor's values of community, hard work, and following one's dreams, she says.

"Vision encourages people to make big goals," says Jessica.

"Vulnerability means staying true to yourself, being real with other people, and being willing to try—even in the face of doubt and failure. Voice refers to openly sharing your dreams, as well as your challenges and fears, with people. Your voice is powerful; use it to create your world and incorporate others in your vision."

In 2021, Jessica received HAI's Michelle North Scholarship for Safety, which is awarded to a commercially rated pilot who demonstrates an outstanding aptitude for safe flying and aviation best practices. Jessica says she appreciates HAI's scholarship opportunities because they're available to everyone.

"They aren't biased toward a specific sex," says Jessica.

"Yes, we need more female pilots, but we also need more safe pilots of both sexes. The more opportunities that are open to more people, the better the results."

Overcoming Obstacles

Jessica's success a year after starting V3 shows her determination to make her wildest dreams come true. It wasn't easy, however, she says. One of the biggest challenges she faced in becoming a pilot was one that's commonly cited in the industry: finances. Another obstacle she encountered while starting out in aviation isn't frequently reported by aspiring helicopter pilots: obtaining her second-class FAA medical certificate.

"If you're healthy, [the medical exam] should be straightforward," says Jessica, who suffers from osteoarthritis. "I thought it would be an easy box to check, but boy, was I wrong."

"I would suggest to other aviators who haven't been through the process to talk to people who've done it before, especially if you have a medical condition," Jessica

adds. "Talk to someone with a similar condition, or a physician, so you can get a feel for what will be required of you [to pass]."


The medical exam notwithstanding, Jessica doesn't let roadblocks keep her down, and her optimistic personality allows her to see the positives throughout hard times, she says.

"Have you ever seen a kid go bowling with bumpers on? I think life is a similar process: I'm the ball, and the bumpers are my community nudging me in the right direction," says Jessica. "The ball won't go in a straight line, and I'll crash into the sides every now and then, but I'll get the strike if I start with enough momentum, keep it rolling, and accept help from my community."

Jessica cites the help she's received from other professionals in the field, including her mentors, as a source of her inspiration. She mentions Dave Johnson, her designated pilot examiner for most of her ratings. The longtime pilot has flown fixed-wing aircraft, helicopters, hot-air balloons, gliders—you name it. His extensive career, passion for aviation, and humility have left their mark on Jessica. Another mentor, Darryl James, a Vietnam veteran pilot, taught her to be tenacious and confident, Jessica says.

"[Darryl] told me, 'You're not flying a helicopter, you're managing energy. Someday, the helicopter will simply become an extension of yourself. If you shift your thinking from all the controls and details and boil it down to where your energy is stored in the system (airspeed, altitude, how fast your rotors are turning), then you can manage a helicopter in a completely different way.' Nine hundred hours later, I notice that same mentality within myself."

In addition to passing on to others the lessons she's learned from her mentors, Jessica offers a piece of her own advice for new aviators.

"Be resourceful," she says. "Fiercely network, and volunteer your time. And never give up or let someone tell you you shouldn't or can't!" 



RECENT ACCIDENTS & INCIDENTS

THE ROTORCRAFT ACCIDENTS AND INCIDENTS LISTED BELOW OCCURRED FROM JUL. 1, 2021, TO OCT. 31, 2021. The accident details shown are preliminary information, subject to change, and may contain errors. All information was obtained through the official websites included below, where you can learn more details about each event.

Australia—Australian Transport Safety Bureau (ATSB): bit.ly/2P3ZF1S

United States—National Transportation Safety Board (NTSB): bit.ly/2lueqZa

July 2021

Bell 212

Weed, CA, USA
Jul. 7, 2021 | [NTSB WPR21LA268](#)
0 injuries, 0 fatalities | External-load flight
Pilot reported vibrations during water-bucket retrieval before helicopter settled into water for undetermined reasons.

Robinson R44

Mikotajki, Poland
Jul. 7, 2021 | [NTSB GAA21WA166](#)
Injuries unknown, fatalities unknown | Flight type unknown
No description available.

Bell 206L-3

Berlin, IL, USA
Jul. 9, 2021 | [NTSB CEN21LA432](#)
0 injuries, 0 fatalities | Agricultural flight
No description available.

Bell 412

Ejea de los Caballeros, Spain
Jul. 11, 2021 | [NTSB GAA21WA171](#)
Injuries unknown, fatalities unknown | Flight type unknown
No description available.

Sikorsky / S92

South Havra, Scotland
Jul. 15, 2021 | [NTSB GAA21WA193](#)
Injuries unknown, fatalities unknown | Flight type unknown
No description available.

Robinson R44

Lewisburg, KY, USA
Jul. 16, 2021 | [NTSB ERA21LA292](#)
2 injuries, 0 fatalities | Agricultural flight
Heavily loaded helicopter experienced low rotor rpm after takeoff, landed hard, and rolled over.

Robinson R44

Elgin, MN, USA
Jul. 19, 2021 | [NTSB CEN21FA330](#)
0 injuries, 1 fatality | Agricultural flight
Helicopter struck a power line, impacted terrain, and was destroyed following a post-crash fire.

Robinson R44

Point Harbor, NC, USA
Jul. 19, 2021 | [NTSB ERA21LA295](#)
0 injuries, 2 fatalities | Personal flight
Helicopter completed off-airport landing before resuming flight and impacting the water. Marginal weather conditions were reported in the area.

Robinson R44

Mineral Point, WI, USA
Jul. 20, 2021 | [NTSB CEN21LA452](#)
0 injuries, 0 fatalities | Agricultural flight
No description available.

Robinson R44

West Liberty, IA, USA
Jul. 20, 2021 | [NTSB CEN21LA339](#)
0 injuries, 0 fatalities | Personal flight
No description available.

Sikorsky S-76

Soehanah, South China Sea, Indonesia
Jul. 20, 2021 | [NTSB GAA21WA187](#)
0 injuries, 0 fatalities | Flight type unknown
No description available.

MD Helicopters MD 900

London, England
Jul. 25, 2021 | [NTSB GAA21WA188](#)
Injuries unknown, fatalities unknown | Flight type unknown
No description available.

Enstrom F-28A

Mountain Home, ID, USA
Jul. 28, 2021 | [NTSB WPR21LA293](#)
0 injuries, 0 fatalities | Personal flight
Helicopter landed hard and was substantially damaged following power loss in a hover due to fuel starvation.

Bell 206

Polička, Czech Republic
Jul. 30, 2021 | [NTSB GAA21WA191](#)
0 injuries, 0 fatalities | Flight type unknown
No description available.

Enstrom 280FX

Colchester, VT, USA
Jul. 30, 2021 | [NTSB ERA21LA309](#)
1 injury, 0 fatalities | Business flight
Pilot reported smoke in cockpit and loss of power, then completed autorotative landing and egressed aircraft before it was destroyed by fire.

Robinson R66

Merry, NE, USA
Jul. 30, 2021 | [NTSB CEN21LA348](#)
1 injury, 0 fatalities | Agricultural flight
No description available.

Robinson R44

Randolph, WI, USA
Jul. 31, 2021 | [NTSB CEN21LA349](#)
1 injury, 0 fatalities | Agricultural flight
No description available.

August 2021

Robinson R66

Colusa, CA, USA
Aug. 1, 2021 | [NTSB WPR21FA300](#)
0 injuries, 4 fatalities | Personal flight
Helicopter impacted terrain for undetermined reasons.

Bell 206B

Corydon, IN, USA
Aug. 4, 2021 | [NTSB CEN21LA356](#)
1 injury, 0 fatalities | Agricultural flight
No description available.

Robinson R44

Waukon, IA, USA
Aug. 4, 2021 | [NTSB CEN21LA350](#)
1 injury, 0 fatalities | Agricultural flight
No description available.

RotorWay Exec 162F

Argyle, NY, USA

Aug. 7, 2021 | [NTSB ERA21FA317](#)

0 injuries, 2 fatalities | Personal flight

Amateur-built helicopter crashed shortly after takeoff and was destroyed in post-impact fire.

Robinson R44

Wheeling, IL, USA

Aug. 11, 2021 | [NTSB CEN21LA369](#)

1 injury, 0 fatalities | Personal flight

Pilot reported rpm fluctuations and attempted autorotative landing, at which time main rotor struck a pole and helicopter was substantially damaged.

Robinson R22

West Jordan, UT, USA

Aug. 14, 2021 | [NTSB WPR21LA320](#)

2 injuries, 0 fatalities | Instructional flight

Pilots reported loss of power during approach to landing before ground impact and rollover.

Hummer 260L

Livingston, TN, USA

Aug. 18, 2021 | [NTSB ERA21LA335](#)

0 injuries, 0 fatalities | Personal flight

During takeoff climb, pilot reported power fluctuations and attempted to perform an autorotation that resulted in a hard landing and rollover.

RotorWay Exec 162F

Lindale, GA, USA

Aug. 18, 2021 | [NTSB ERA21LA332](#)

0 injuries, 0 fatalities | Flight type unknown

No description available.

Eurocopter BO105

Archerfield Aerodrome, Queensland, Australia

Aug. 19, 2021 | [ATSB AO-2021-035](#)

0 injuries, 0 fatalities | Aerial work flight

Flight crew reported abnormal airframe vibration and completed successful landing. Post-flight inspection revealed a crack in one of the main rotor blades.

Robinson R44

Gonzales, LA, USA

Aug. 20, 2021 | [NTSB CEN21LA378](#)

0 injuries, 0 fatalities | Personal flight

No description available.

Robinson R44

New Roads, LA, USA

Aug. 20, 2021 | [NTSB CEN21LA385](#)

0 injuries, 0 fatalities | Personal flight

No description available.

Enstrom 280C

Port Orange, FL, USA

Aug. 21, 2021 | [NTSB ERA21LA339](#)

0 injuries, 0 fatalities | Personal flight

Helicopter lost tail-rotor authority during landing, resulting in hard landing with substantial damage.

Enstrom 280FX

Llanfachreth, Wales

Aug. 25, 2021 | [NTSB GAA21WA247](#)

0 injuries, 0 fatalities | Flight type unknown

No description available.

Bell 206L-1

Glide, OR, USA

Aug. 27, 2021 | [NTSB WPR21LA333](#)

1 injury, 0 fatalities | Agricultural flight

No description available.

Robinson R22

Arnaudville, LA, USA

Aug. 27, 2021 | [NTSB CEN21LA389](#)

0 injuries, 0 fatalities | Positioning flight

During attempted landing, pilot reported uncontrolled right yaw before helicopter impacted ground and rolled over.

Robinson R44

Camp Verde, AZ, USA

Aug. 27, 2021 | [NTSB WPR21LA341](#)

0 injuries, 0 fatalities | Public aircraft

No description available.

Robinson R44

Kamanjab, Namibia

Aug. 28, 2021 | [NTSB GAA21WA223](#)

0 injuries, 0 fatalities | Flight type unknown

No description available.

Robinson R44

Pelican, AK, USA

Aug. 30, 2021 | [NTSB ANC21LA079](#)

0 injuries, 0 fatalities | External-load flight

No description available.

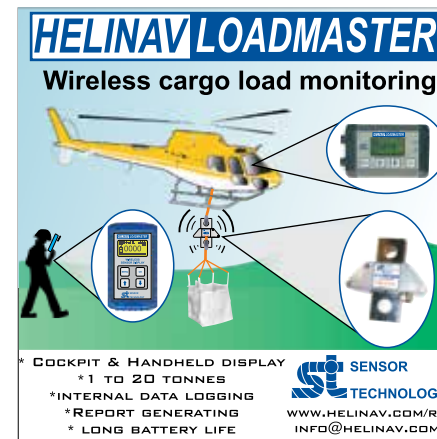
Robinson R44

Pelican, AK, USA

Aug. 30, 2021 | [NTSB ANC21LA080](#)

0 injuries, 0 fatalities | Positioning flight

No description available.



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RECENT ACCIDENTS & INCIDENTS



September 2021

McDonnell Douglas 369E

Delta Junction, AK, USA
Sep. 6, 2021 | [NTSB ANC21LA083](#)
0 injuries, 0 fatalities | Air taxi flight
No description available.

Bell 206L-3

Tillamook, Oregon, USA
Sep. 8, 2021 | [NTSB WPR21LA338](#)
0 injuries, 0 fatalities | Agricultural flight
During agricultural reconnaissance flight, pilot struck a power line, lost control, and impacted terrain.

Enstrom F-28

Toughkenamon, PA, USA
Sep. 8, 2021 | [NTSB ERA21LA357](#)
0 injuries, 0 fatalities | Personal flight
No description available.

Robinson R22

Mentone, TX, USA
Sep. 10, 2021 | [NTSB CEN21FA410](#)
0 injuries, 1 fatality | Aerial observation flight
Helicopter impacted terrain near damaged power lines during observation flight. Additional evidence of wire-strike damage was noted on accident aircraft.

Eurocopter AS350 B2

Romeo, MI, USA
Sep. 15, 2021 | [NTSB CEN21LA431](#)
0 injuries, 0 fatalities | Instructional flight
No description available.

Robinson R66

Monticello, GA, USA
Sep. 15, 2021 | [NTSB ERA21FA362](#)
0 injuries, 3 fatalities | Air taxi flight
Helicopter impacted terrain for undetermined reasons. Earlier in flight, pilot had landed in a field to avoid poor weather, then resumed flight.

Robinson R66

Reynoldsville, IL, USA
Sep. 15, 2021 | [NTSB CEN21LA421](#)
0 injuries, 0 fatalities | Agricultural flight
No description available.

Hughes 369

Ash, NC, USA
Sep. 17, 2021 | [NTSB ERA21LA368](#)
0 injuries, 0 fatalities | Agricultural flight
During takeoff, pilot noted loss of rotor rpm and was unable to arrest descent before helicopter impacted ground and rolled over.

Michael W Morgan Sport Copter Vortex

Kingsland, TX, USA
Sep. 19, 2021 | [NTSB CEN21LA447](#)
0 injuries, 0 fatalities | Personal flight
No description available.

Hiller UH-12E

Bovill, ID, USA
Sep. 23, 2021 | [NTSB WPR21LA354](#)
1 injury, 0 fatalities | Agricultural flight
During approach to refill bucket on agricultural flight, pilot reported a power loss for unknown reasons before impacting sloping terrain and rolling over.

Bell 407

Patterson, LA, USA
Sep. 25, 2021 | [NTSB CEN21LA456](#)
0 injuries, 0 fatalities | Air taxi flight
No description available.

Robinson R44

Miami, FL, USA
Sep. 28, 2021 | [NTSB ERA21LA387](#)
1 injury, 0 fatalities | Personal flight
Shortly after helicopter touchdown, an unplanned takeoff resulted in loss of yaw control, ground impact, and rollover.

Eurocopter AS350 B3

Kinston, NC, USA
Sep. 29, 2021 | [NTSB ERA21LA390](#)
0 injuries, 0 fatalities | Public aircraft
No description available.

Hiller UH-12E

Millen, GA, USA
Sep. 29, 2021 | [NTSB ERA21LA386](#)
1 injury, 0 fatalities | Agricultural flight
Pilot reported high engine rpm and loss of flight-control authority before ground impact.

Guimbal Cabri G2

Aegerten, Switzerland
Sep. 30, 2021 | [NTSB GAA21WA245](#)
0 injuries, 0 fatalities | Flight type unknown
No description available.

Robinson R44

Phoenix, AZ, USA
Sep. 30, 2021 | [NTSB WPR21LA359](#)
1 injury, 0 fatalities | Personal flight
No description available.

October 2021

Robinson R22 and Piper PA-28-181

Chandler, AZ, USA
Oct. 1, 2021 | [NTSB WPR22FA001](#)
0 injuries, 2 fatalities | Instructional flight
During instructional flight at an airport, helicopter collided midair with fixed-wing aircraft, lost control, and impacted terrain.

Robinson R66

Delta, MO, USA
Oct. 5, 2021 | [NTSB CEN22LA006](#)
0 injuries, 0 fatalities | Agricultural flight
No description available.

Bell 206B

Gonzales, LA, USA
Oct. 6, 2021 | [NTSB CEN22LA009](#)
1 injury, 0 fatalities | Public aircraft
During approach to landing, pilot reported loss of tail-rotor authority and completed an emergency landing.

Bell 429

Batavia, NY, USA
Oct. 6, 2021 | [NTSB ERA22LA007](#)
0 injuries, 0 fatalities | Positioning flight
No description available.

RotorWay Exec 162F

Cape Town, South Africa
Oct. 9, 2021 | [NTSB GAA22WA016](#)
0 injuries, 0 fatalities | Flight type unknown
No description available.

Robinson R44

Cornwall, NY, USA
Oct. 10, 2021 | [NTSB ERA22FA010](#)
0 injuries, 1 fatality | Personal flight
Helicopter impacted terrain for undetermined reasons.

Robinson R44

Palmer, AK, USA
Oct. 10, 2021 | [NTSB ANC22LA001](#)
0 injuries, 0 fatalities | Air taxi flight
No description available.

Eurocopter AS350 B3

Tucson, AZ, USA
Oct. 16, 2021 | [NTSB WPR22LA018](#)
0 injuries, 0 fatalities | Air taxi flight
No description available.

Robinson R44

Buchen, Germany
Oct. 17, 2021 | [NTSB GAA22WA012](#)
Injuries unknown, fatalities unknown | Flight type unknown
No description available.

Bell 206L-3

Covelo, CA, USA
Oct. 28, 2021 | [NTSB WPR22LA031](#)
0 injuries, 0 fatalities | Aerial observation flight
No description available.

Training for the Emergency

Inadequate training, technical ignorance lead to tragedy.



SOME EMERGENCY SITUATIONS CAN'T BE both realistically and safely simulated in flight. That fact, of course, was a major impetus behind the development of high-fidelity flight simulators, but simulators aren't available for every make and model of helicopter, and those that do exist aren't equally accessible to every operator. This poses a quandary as to how to train in the corresponding procedures.

Reviewing checklists or manuals on the ground is of limited utility in preparing for situations that are rare but consequential: A 2007 NASA study of airline crews found that 85% of "textbook" emergencies that matched their training scenarios were handled well, compared with just 7% of unfamiliar situations.

And in helicopters, the ground's usually a lot closer.

The Flight

At 8:17 am on Jun. 14, 2018, ZK-ILD, an MD Helicopters MD 600N, lifted off with five on board to conduct an aerial survey of Ngamatea Station, a large sheep and cattle farm on New Zealand's North Island. About 24 minutes into the flight, while descending through 300 ft.,

the pilot advised the passengers of an unspecified "problem" with the helicopter. Though they were less than two minutes from their point of departure, he continued straight for around 1,300 m (4,300 ft.) before turning left and attempting to land.

The helicopter touched down hard and bounced, rotating 90 degrees, and the main rotor severed the tail boom. The engine surged as the helicopter hit the ground again, setting up a violent vibration that destroyed the airframe and continued until a catastrophic overspeed caused the uncontained failure of the power turbine.

The pilot, front-seat passenger, and rear-seat passenger all suffered severe head injuries. The two middle-seat passengers evacuated the cabin with only minor injuries and used the onboard fire extinguisher to douse flames escaping from the engine's combustion section.

The emergency locator transmitter was activated and its signal relayed to the Rescue Coordination Centre (RCCNZ) at 8:46. The first rescuers reached the site six minutes later. Four helicopters eventually transported the injured to hospitals. The front-seat passenger,

manager of Ngamatea Station, died the following day. The pilot survived but couldn't be interviewed for two months, then had no memory of the accident flight. The rear-seat passenger, another company pilot not rated for the MD 600N, did recall the flight.



The wrecked fuselage of ZK-ILD at the accident site.

The Aircraft

The MD 600N is an eight-seat single-engine helicopter with a fully articulated six-blade main rotor system. It's powered by a Rolls-Royce 250-C47M turboshaft engine rated for 600 shaft horsepower governed by full-authority digital engine control (FADEC) with manual backup. Anti-torque control is provided by the NOTAR (no tail rotor) system in place of a conventional tail rotor.

ZK-ILD was manufactured in 2000 and imported to New Zealand in March 2018, just three months before the flight in question. At the time, it was one of only two MD 600Ns in the entire country. While this model is normally flown from the left side, some, including ZK-ILD, have been modified to allow single-pilot operation from the right front seat by removing the left cyclic and pedals. Scheduled airframe and engine maintenance were completed on Mar. 29.

The MD 600N's FADEC system uses a hydromechanical unit (HMU) to provide and meter fuel flow to the engine, adjusted by an electronic control unit (ECU) in response to both internal engine status and flight control inputs. Separate wiring harnesses connect the ECU to the engine and airframe sensors.

In normal operation, the system controls both power output and main rotor speed without need for direct intervention by the pilot. Signals from the ECU to an electric step motor in the HMU adjust fuel flow to meet power demands while maintaining main rotor rpm within

normal operating range.

Redundancy against engine shutdown is provided by four distinct operating modes. In full FADEC, the ECU's primary control channel monitors two separate measures of fuel flow transmitted from the HMU. If they differ by more than a specified threshold, the primary channel flags a "step count failure" and transfers control to a reversionary governor, which compares measurements of the rate of change in engine speed from two different sensors and illuminates three amber lights on the panel warning of degraded FADEC function.

If the difference between those inputs exceeds the specified threshold, the reversionary governor also records a fault and freezes the step motor in its current position, placing the engine in fixed fuel-flow mode. Until the pilot disengages FADEC using the switch on the collective, power output remains constant regardless of flight control inputs. Main rotor rpm will decrease when the collective is raised and increase when it's lowered. The red "ECU FAIL" warning on the panel and an accompanying audible warning advise the pilot that the FADEC system is now entirely inoperative.

The appropriate response, as detailed in the "Emergency Procedures" section of the Rotorcraft Flight Manual, is for the pilot to attempt to reset the ECU by briefly switching the FADEC control on the collective from AUTO to MANUAL. If it doesn't reset in two attempts, the pilot is to set it to MANUAL and, using the collective's twist-grip throttle, reduce power to prevent an overspeed. A separate mechanical linkage connects the twist grip to the HMU's fuel metering valve, allowing the pilot to modulate engine and rotor rpm until a safe precautionary landing can be made.

The Pilot

The 45-year-old commercial pilot began training for his MD 600N type rating on Apr. 13, 2018. He was the operator's chief executive and senior pilot, with more than 9,600 hours of helicopter experience, some in models powered by non-FADEC versions of the RR-250 engine. He obtained his type rating after 2.3 hours of dual instruction and another 2.2 supervised by a 7,000-hour Category D instructor with about 250 hours in make and model. By the day of the accident, the pilot had logged 45 hours in ZK-ILD.

Both the pilot and instructor confirmed that they had never practiced using manual throttle control in flight due to the perceived risk of overspeed. Moreover, the instructor recalled having discussed this point during his own type rating training in 2003 with a Category A instructor who'd advised against practicing the

procedure in the aircraft.

New Zealand's type rating requirements allow latitude for demonstrating "knowledge" of procedures that can't be safely demonstrated in the aircraft, but the pilot's response to the written exam's question about the "ECU FAIL" warning made no mention of switching to manual mode or using the twist throttle. It was marked incorrect but never revised. The instructor subsequently signed him off as competent in FADEC/ECU emergency procedures on the required Civil Aviation Authority form.

The Investigation

The ECU and HMU were examined by their respective manufacturers. Downloaded data showed that the primary ECU channel shut down 17 minutes into the flight. Eight minutes later, the reversionary governor defaulted to fixed fuel-flow mode. The FADEC switch remained in the AUTO position, and the helicopter touched down 68 seconds later. The ECU had also recorded a "step count failure" on an earlier flight that transferred control to the reversionary governor without being noticed by the pilot. Post-accident testing failed to replicate any of these faults.

While much of the damage might have been avoided had the pilot shut down the engine after the first bounce using the twist grip or fuel-cutoff valve, the Transport Accident Investigation Commission (TAIC) noted that the "severe vibration created by the imbalanced rotor system" likely impeded his response.

The TAIC also noted that none of the occupants wore helmets, likely contributing to the severity of the head injuries sustained. The operator subsequently adopted a

formal policy requiring its pilots to wear helmets on all flights, and on May 27, 2021, the TAIC asked the director of civil aviation to "promote education awareness of the benefits of ... occupants wearing appropriate helmets when practicable."

The Takeaway

The belief that operating by manual throttle control posed an undue risk of overspeed was apparently prevalent among New Zealand's relatively small number of MD 600N pilots, as was incomplete understanding of the architecture of the FADEC system. (Two MD 600N pilots interviewed by the TAIC "were unaware of the existence of the reversionary governor.") They shared a reluctance not just to practice using the twist-grip throttle but even to using it in a true emergency.

The manufacturer advised the TAIC that it has established a procedure for training pilots in the use of the manual mode. However, the company regards the procedure as "proprietary information ... not available outside the manufacturer's own training organization."

This description doesn't make clear whether the manufacturer's procedure is performed in the aircraft or via simulation using specialized equipment. If the latter, this might justify the added expense of factory training, even on another continent. If the former, however, there's a strong argument that the company's long-term benefit in fostering effective emergency-procedures training among everyone flying its aircraft would outweigh any loss of training revenue.

Practice doesn't automatically make perfect, but it usually beats ignorance. 🌀

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Are Service Bulletins Mandatory?

Focusing on semantics over content misses the point and could lead to potential safety hazards.

THE OVERHAULED ENGINE had been running fine, with a normal break-in pattern.

Then, at about 170 hours, the owner received an email from his parts supplier alerting him that one of the through-bolts he purchased for the overhaul had been engineered incorrectly and that he “could possibly” have one of the suspected parts.

The manufacturer had issued a mandatory service bulletin requiring that the affected through-bolts be replaced, and the supplier assured the customer the new part would be on its way soon, at no charge.

This scenario sounds good—until you realize that although the replacement bolt may be free, the labor cost to install it is double or triple the cost of the part itself, and the manufacturer won’t be reimbursing you for the expense, even though it’s their fault you need the labor in the first place.

The Purpose of Service Bulletins

At this point, you might be wondering whether our bolt customer was required to change the suspected part

based on a service bulletin mandate. If the aircraft is being used in accordance with 14 CFR Part 91, the answer is no, as long as it’s not part of an issued airworthiness directive (AD).

But is it a good idea to ignore a service bulletin? Before we answer that question, let’s explore why service bulletins are issued.

Manufacturers issue service bulletins to make owners aware of maintenance issues, manufacturing deficiencies, or product improvements that could affect



safety. If the bulletin is highlighted with words such as “mandatory,” “emergency,” or “alert,” the manufacturer is telling you the information is of significant safety importance but hasn’t risen to the level of an airworthiness directive—at least not yet. The bulletin alone isn’t mandatory for Part 91 operators even though it uses powerful words implying that it is.

In the bolt customer’s case, the manufacturer couldn’t tell him whether the newly overhauled engine had a defective through-bolt; the company could only say the part was purchased during the time frame in which defective parts were manufactured. So, should the suspected through-bolt be replaced?

Doing so would require removing several other assemblies in the way, parts such as the oil cooler, governor, and engine baffling, thus creating more work.

Furthermore, the engine was running fine with no indication of an impending problem. We’re talking about hours of maintenance labor costs and aircraft downtime.

Expect the Unexpected

In the end, the bolt customer decided to have the maintenance performed in accordance with the mandatory service bulletin. He expected the identified bolt would

Service bulletins are intended to inform aircraft owners of problems the manufacturer has identified with their product. Ignore them at your peril.

be removed and found to be a good, unaffected part. After completion, the work could be signed off as performed and everyone would be happy.

But that's not what happened. The through-bolt was removed, but even though the engine had been running well and hadn't presented any signs of possible problems, the part was indeed inaccurately engineered, as seen in the photo at right. (The bolt pictured on the right is the defective one.)

The bolt's center dowel section, which keeps the engine case from vibrating and chaffing during operation, was about half an inch out of position, potentially depriving one of the case halves of the dowel's support, thereby allowing it to vibrate. This, in turn, could have led to aluminum fretting and allowed the crankshaft bearings to slip, resulting in oil-lubrication and cooling problems. The end result could have been a loss of engine power.

Whose Guidance Are You Following?

Back to our question of whether complying with a service bulletin is required.


I hope you answered with a hearty YES. If you didn't,

I hope you at least think it's a good idea.

Allow me to ask another question: If you're not following the manufacturer's guidance, whose guidance are you following? Consider your answer carefully.

Bottom line: Follow the manufacturer's recommendations for maintenance. They have the expertise to issue the correct guidance. If that guidance comes in the form of a service bulletin, make sure it doesn't pertain to your aircraft or appliance before you disregard it.

Service bulletins are intended to inform aircraft owners of problems the manufacturer has identified with their product, or of enhanced ways to care for one's machine. Ignore them at your peril.

Fugere tutum! 



The part on the right (above) was improperly engineered, with its center dowel section out of position.

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WATCH
Dave Dziura
on Leaving
Yourself
an Escape
Route

Always Leave an Escape Route

Helicopter pilots tend to plan for the worst—a mentality that goes hand in hand with having a (flight) plan B.

HELICOPTER PILOTS UNDERSTAND that maintaining a constant “escape” mentality is an essential survival skill that allows us to differentiate between bold pilots and old pilots. Most aspiring helicopter pilots who received top-tier flight instruction quickly learn to always visualize what they’ll do and where they’ll go in the event of a catastrophic system failure.

Every astute helicopter pilot (particularly those in single-engine aircraft) flying today is actively or subconsciously considering their first turn and subsequent flight path to the most suitable landing area within autorotational glide distance. By the time you read this

sentence, most of those pilots likely will have shifted to another location at least once.

On High Alert

The contingency-plan mindset is particularly necessary in high-risk situations.

“It’s especially important to identify an escape route when operating at the edge of your aircraft’s performance envelope or in high-density altitudes,” says Dave Dziura, chief pilot for Colorado Heli-Ops and chair of HAI’s Safety Working Group. “If your landing site is confined, identify during the approach the altitude and location at which your escape route or go-around option will

Visit rotor.org/sos to view and download this and additional safety resources, including videos and posters.

**LEAVE YOURSELF AN
 ESCAPE ROUTE**

**PLAN FOR THE WORST-CASE
 SCENARIO, SO YOU DON'T
 FALL VICTIM TO ONE**

UPON APPROACH:

- IDENTIFY A GO-AROUND FOR EARLY LANDING
- PLAN FOR AN UNEXPECTED LOSS OF ALTITUDE
- MENTALLY REHEARSE YOUR ESCAPE ROUTES

Spotlight on Safety

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fall through—this is your commitment point.

“Practice a scan of your power margin, pedal position, and rate of descent prior to that point, to trigger the go-around if anything’s in question,” Dziura adds. “It’s crucial to ensure you have adequate margin, *before* the commitment point, for a loss of headwind or change in conditions as you descend below obstacles.”

The same holds true for takeoffs over an obstacle, Dziura says. In such cases, identify a point where you’ll abort the takeoff safely if you’re not clear of the obstacle. Practicing this plan of “escape” before executing the maneuver will pay off when it matters.

Put Safety Ahead of Your Ego

If you think that going around for a new approach or aborting a maneuver will make you look like a bad pilot, rethink your



Dave Dziura, chief pilot at Colorado Heli-Ops and chair of the HAI Safety Working Group, flies a scenic tour outside Boulder, Colorado, in a Bell 505. He regularly provides flight instruction in the aircraft as well as Robinson helicopters.

attitude. As Dziura wisely warns, arrogance has no place in the cockpit.

“Someone once told me the only reason not to go around when conditions

aren’t ideal is ego. Keeping this in mind keeps me humble and prepared to put the safety of the operation ahead of the operation itself.”

Safety: Who Will Survive?

GIVEN HELICOPTER PILOTS’ WELL-EARNED REPUTATION as aviators who plan for the worst, you’d think we’d have better success at preventing accidents. A quick review of our accident rates and common causal factors, however, suggests that, regrettably, we don’t.

Accident Prevention Still Falling Short

I share my industry colleagues’ frustrations in observing the trend of preventable global rotorcraft accidents. Despite our best efforts to reduce fatal accident rates through enhanced training, safety management systems, industry standards, best practices, safety culture, and so on, our goals appear to remain elusive. We know we must do something, but what we choose to do is a matter of some debate.

Here are some questions we must confront while promoting global rotorcraft safety through targeted accident-prevention efforts:

- Why must we continue to remind pilots to do the right thing?
- How do we make the business case for safety?
- Which safety promotion activities are the most effective?
- Will we ever reach the “unreachable” people in our profession, and how much time should we invest in attempting to do so?

I don’t claim to have the best answers to these questions.

I do know, however, that pilots and mechanics/engineers don’t purposefully set out to crash their aircraft. Rather, they fail to acknowledge an insidious chain of errors and omissions and miss the one final opportunity to break it. Despite our inherent pessimism, we unwittingly fall prey to the human condition.

A Matter of Survival

Our industry faces growing existential threats from many fronts, including community opposition and overregulation. Whether fairly or unfairly, our safety performance is being judged—and we’ve been found wanting. Each helicopter crash, while often tragic in its own right, also erodes the trust of the public we serve, and regulators must answer to them.

I’m honored to join the growing number of global aviation safety professionals in HAI’s working groups, the Vertical Aviation Safety Team, and the US Helicopter Safety Team who remain undeterred. In an industry necessarily filled with pessimists, we choose to remain optimistic about our ability to prevent accidents.

And we’ll continue to carry the torch and promote critical safety initiatives to support the survival of our industry.

Harold Summers

HAI director of flight operations was an industry icon.

HAROLD “HAL” SUMMERS, DIRECTOR OF FLIGHT operations for HAI for nearly 18 years and a fixture in the rotorcraft industry since the 1960s, died Oct. 20, 2021. He was 83.

Hal’s extraordinary aviation career spanned more than six decades. After receiving his A&P license in 1960, he worked in Alaska and then in 1964 joined Petroleum Helicopters Inc. (PHI) as a mechanic–pilot. Hal steadily rose through the ranks at PHI to eventually become a VP with responsibility for maintenance. In that role, he presided over maintenance and support for a global fleet, overseeing more than 400 helicopters in the Gulf of Mexico alone. He later served as acting chief engineer for a joint venture between PHI and China Southern Helicopter Co. in Zhuhai, Guangdong, China, where he met his wife, Zhilin.

In 2004, Hal joined HAI, where he managed the fly-in and

fly-out each year for HAI HELI-EXPO®. In that role, he worked with local airports to coordinate staging and fueling sites and with the FAA to meet regulatory requirements. He then managed the arrival and departure of up to 60 helicopters to be displayed on the show floor at each Expo. Hal also worked with other HAI staff members, regulators, and industry stakeholders to resolve issues for HAI members.

Hal was equally active in myriad HAI working groups, industry



In directing the fly-in and fly-out each year for HAI HELI-EXPO®, Hal (far right) managed the arrival and departure of up to 60 helicopters to be displayed on the show floor. Here, he joins HAI staffers (from left) Cade Clark, VP of government affairs; Chris Hill, director of safety; and Zac Noble, director of maintenance and technology, at the 2019 Expo in Atlanta.

working groups, and national and international regulatory committees and working groups, including several at the FAA. In 2011, he received the FAA's Charles Taylor Master Mechanic Award, which recognizes 50 years of working in aircraft maintenance.

In addition to his many achievements in the field of aircraft maintenance, Hal established an engineering department for PHI with the objective of designing, certifying, and producing medical interiors for the operator's then newly formed Emergency Medical Division. In the ensuing years, he was responsible for the design, certification, and fielding of more than 50 air ambulance interiors.

Born in Newport, Oregon, in 1938, Hal and his family moved to Brewster, Washington, in 1939 and then to Cuba in 1949, when Hal's father, Laurance, a minister, was asked by his ministry to relocate to the Caribbean country. The family returned to the United States in 1953.

In addition to his wife, Hal is survived by four children and a brother. [R](#)



Hal was awarded the FAA's Charles Taylor Master Mechanic Award in 2011 in honor of his more than 50 years of service in aviation maintenance. He is pictured here with his wife, Zhilin, receiving the award.

Alvin S. Trenk

Entrepreneur formed several aviation businesses over a 50-year career.

ALVIN S. TRENK, AVIATION ENTREPRENEUR and philanthropist, died Sep. 26, 2021. He was 92.

After earning pilot licenses for both helicopters and fixed-wing aircraft, Al in 1980 started Air Pegasus, a corporate helicopter and sightseeing venture based at the West 30th Street Heliport (KJRA) in Manhattan, New York. For a time, he also operated the Downtown Manhattan Heliport (KJRB) near Wall Street. In addition, Al cofounded Sightseeing Tours of America, Liberty Helicopters, and Saker Aviation Services, which operates a chain of US-based FBOs.

Al was instrumental in introducing Agusta helicopters to the United States, and he helped pioneer aviation tourism in Las Vegas with helicopter trips over the Grand Canyon.

Born in Newark, New Jersey, in 1929, Al served in the US Air Force during the Korean War. Afterward, he went on to operate a variety of businesses that included an insurance company, a West Virginia racehorse track, and a chain of outpatient dialysis clinics.

Al is survived by his partner, Ethel Gittlin, and three

children, three grandchildren, and four great-grandchildren. [R](#)



Al and his grandson—and protégé—Adam Trenk. Adam is one of three grandchildren who survive Al.

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LAST LOOK

By Mark Bennett

Children's Health, Dallas, Texas
Sikorsky S-76C++



Children's Health has been operating helicopters as part of its Neonatal and Pediatric Specialty Transport service since 2005, normally carrying premature infants, children, and high-risk obstetrical patients—sometimes with family members—on 25 to 30 flights each month. Those flights were less frequent at the onset of the COVID-19 pandemic but are now approaching their previous level.

While the main Children's Health facilities are in Dallas, their S-76C++ was photographed in a suburb north of the city, on the helipad at Children's Medical Center Plano. On board were pilot Kandy Fleming, pilot Hayden Bergin, registered respiratory therapist Timothy Dewberry, paramedic Luke Coffee, and registered nurse Jayme Pemberton.



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