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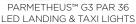
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## ROTOR

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**ON THE COVER:** Incoming HAI Chair Jeff Smith enjoys the bright spring sun at Teterboro Airport (KTEB) in New Jersey, shortly after arriving in an AW139. The chief pilot for R.O.P. Aviation, Smith routinely flies in some of the world's most congested airspace, the New York City metropolitan area. Photograph by Dan Sweet who, when not directing HAI's public relations and communications program, moonlights as an aviation photographer.

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#### Mark Bennett

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

30-plus years of photography and design experience serving the aerospace and defense industries, he founded AeroMark Images to shoot and write for both industry and media.



#### Jen Bover

Jen Boyer is the principal of her own firm, Flying Penguin Communications. She has a bachelor's degree in journalism and holds commercial, instrument.

flight instructor, and instrument instructor ratings in helicopters and a private rating in airplanes. She has worked as a professional journalist and marketing communicator in the aviation industry since the early 1990s.



#### **Greg Calvert**

Greg Calvert is a former US Army conventional and special operations rotary and fixed-wing aviator, ATP, instructor pilot, instrument examiner, aviation

mission survivability officer, and aviation safety officer. He is also a trained military and civil aviation accident investigator. He is currently fortunate enough to fly helicopter air ambulance ops with some amazing medical professionals in Virginia and still dabbles in airplanes with his local flying club.



#### 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.



#### Jaasmin Foote

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!



#### **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

Safety Institute, where he authored eight editions of its Joseph T. Nall Report and nearly 500 articles. He'd rather be flying.



#### **Christine Knauer**

For more than 25 years, Christine Knauer has written for major aircraft OEMs, MROs, and avionics manufacturers as well as aviation trade organizations and

publications. She specializes in editorial and marketing content that shares the stories of aviation's people and machines. Christine holds a master's degree in aviation safety.



#### Paul Koscak

Paul Koscak is a freelance writer and an aviator. He holds CFI, CFII, and MEI (multi-engine instructor) ratings and has 2,500 total flight hours. A former newspaper

reporter and editor, broadcast journalist, and retired US Air Force Reserve officer, Paul recently retired from the US Customs and Border Protection's Office of Public Affairs.



#### 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, HAI director, flight operations & maintenance, 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 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.

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#### By Randy Rowles



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.

### A Chairman's Reflection

Thank you, HAI!

T'S HARD TO BELIEVE MY TIME AS CHAIRMAN OF THE HAI BOARD OF DIRECTORS is ending. This year has passed with blinding speed, but the memories will last a lifetime! Serving you, the HAI members, has been a humbling experience. Each person I've had the privilege to work with within the HAI community is a true credit to our industry.

The HAI Board of Directors provides guidance to the HAI staff regarding the strategic direction of the association as it pursues its mission to benefit its members while supporting a healthy, robust vertical takeoff and landing (VTOL) industry. This year, HAI has been able to do that in part by hosting HAI HELI-EXPO 2022 in Dallas. Having missed the 2021 show due to COVID-19, we believed bringing together our global industry was both welcome and necessary. And we were right. Attendance at the 2022 show, for both attendees and exhibitors, was at least 90% of our 2020 numbers, even considering the travel challenges still present in March this year. This is no small feat when you consider the attendance numbers of other aviation shows.

While some things have returned to normal, in other ways HAI is changing. Some developments are the result of the transition from longtime President and CEO Matt Zuccaro to Jim Viola, who now holds that position. And soon after Jim assumed the left seat at HAI in early 2020, the world around us changed. Jim's unwavering vision, aided by an incredible staff and supportive board of directors, was a factor in HAI's continued leadership role in aviation.

Committed to serving the entire global VTOL industry, HAI continues to strengthen its international ties. In addition to collaborating regularly with the nine national helicopter associations that are part of our International Partnership Program (IPP), HAI is working more closely with the European Helicopter Association, an IPP member. The board of directors has also brought on Francois Lassale, CEO of Heli SGI, to advise us on international issues. In addition, HAI's working groups are actively working to recruite non-US members. These measures will enable our industry to better navigate our operational, regulatory, and cultural differences while celebrating our mutual commitment to and passion for vertical flight.

Another way our industry is evolving is the new aircraft entering the airspace in the next decade. HAI has engaged the manufacturers and operators of these exciting technologies, offering our support and the benefit of our industry's 75-plus years of operational experience.

Having the opportunity to play a small role in the transformation of our industry has been amazing. Thank you to all the HAI members who chose me to represent their interests on the HAI board and within the larger rotorcraft industry. My positive experiences during my board service were only possible because I was joined there by a group of professionals committed to enhancing HAI's success as a robust organization that enables our community to come together and address our common challenges. Of course, the biggest component in our every achievement has been the support of the HAI members. You make HAI—and all its safety, advocacy, education, and networking programs—possible.

In closing, let me say that HAI is in good hands. Jeff Smith, the incoming HAI board chair, has tremendous passion for our industry. Combined with Jim Viola's tenacity and insight, HAI's future is bright! Whether advocating for our industry, connecting it through events, addressing our challenges, or assisting individual members with their issues, HAI will be there for you. ?



By James A. Viola



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.

## What Is HAI Doing for You?

Choosing to be an HAI member should be easy and rewarding.

S HAI BEGINS A NEW MEMBERSHIP YEAR, I want to thank each one of our members for their support. You have choices about where to spend your dollars, and we very much appreciate the trust you place in HAI when you purchase or renew your membership.

Here are some ways we have worked to earn that trust (visit rotor.org/benefits to learn more): Health Insurance. US-based HAI members now have additional options for health insurance through our partner LIG Solutions. Their licensed experts can connect you with insurance programs for individuals and families, as well as employee programs for business owners, that are customized to meet your needs and your budget. LIG works with major providers, such as Aetna, Humana, and Blue Cross Blue Shield, and has options for a wide range of insurance needs, including major medical, vision, dental, accident, and more. Best of all, LIG stills works for you after you purchase the coverage: you can contact their staff with questions or concerns about coverage and claims at any time.

Loss-of-License Insurance. For pilots and aviation mechanics, your job depends on your license—and that license depends on your ability to meet the job's physical demands. Lockton Companies now offers US-based HAI members insurance that protects you from the financial impact of losing your license because of a medical condition. Coverage can be purchased by an individual member or by a company as an employee benefit.

Legislative and Regulatory Wins. HAI has carefully monitored the threat posed to aviation safety by the implementation of 5G networks, advocating on your behalf with Congress, the FAA and other government agencies, and the wireless industry. Through an HAI petition for exemption, 99% of air ambulance operators have been able to resume Part 135 operations, despite the disruption caused by 5G. Our advocacy also enabled Part 135 HAI operator members to receive \$396 million in COVID relief funds.

Risk Assessment and Management. Our operator members told us they needed help in implementing safety management systems (SMSs), which is considered the global standard for aviation safety management. HAI members can now choose from three industry-leading SMS software solutions. We were also able to negotiate significant price discounts to ensure that SMS is affordable and within reach of any operator. Additionally, HAI members can take advantage of our Aviation Safety Action Program, customizable flight and maintenance riskassessment tools, as well as a new program that brings SMS to line maintenance.

And those new benefits join our established ones, including direct access to HAI technical, regulatory, and legislative staff; discounts on attending or exhibiting at HAI HELI-EXPO®; press coverage in HAI's e-newsletter, ROTOR Daily, and on rotormedia.com; and third-party safety mentoring, coaching, and assessment.

Contact member@rotor.org if you want to make sure you are taking full advantage of your HAI membership. And remember, any employee of an HAI member company also receives member benefits. If you have suggestions about how HAI can do better, please email me at president@rotor.org. I like nothing better than hearing directly from members.

Thank you, again, for your support as we begin another year of keeping your rotors turning! 🕫



## IMHO IN MY HELICOPTER OPINION

By Bruce Landsberg



Bruce Landsberg was appointed vice chairman of the US National Transportation Safety Board in 2018. An Air Force veteran and ATP-rated fixed-wing pilot with more than 7,000 flight hours, he is a recipient of the FAA Wright Brothers Master Pilot Award.

Bruce has been active in aviation safety for decades, including serving 22 years as president of the AOPA Foundation and Air Safety Institute.

# **Another Avoidable Helicopter Crash ... Again**

We know how to prevent these types of accidents. So why aren't we doing it?

T WAS WITH BOTH SADNESS AND DISAPPOINTMENT that the National Transportation Safety Board (NTSB) had to investigate yet another sightseeing aircraft crash, this one in Kekaha, Hawaii, on the island of Kauai, that took place on Dec. 26, 2019. The investigation found that the pilot and his six passengers died after he decided "to continue flight under visual flight rules (VFR) into instrument meteorological conditions (IMC), which resulted in the collision into terrain."

You can read more about this accident in the NTSB accident investigation report, but you really won't find any new or surprising information there. The dangers of continuing VFR flight into IMC conditions, as well as strategies for preventing tragedies of this kind, have been outlined *for years*. The NTSB has made long-standing recommendations to industry and the FAA that would prevent these types of accidents. Yet, we see the same types of events occur over and over and over.

As Yogi Berra famously quipped, "It's like déjà vu all over again!" However, we at the NTSB feel no satisfaction about being proven right once again. Instead, the NTSB wants the FAA and operators to address the problem and end these types of accidents.

Hawaii tour helicopters often have cameras outside the cockpit to provide souvenirs for customers. While the accident helicopter unfortunately did not, videos from other tour aircraft in the area clearly tell the story—just look at the photo opposite. The accident pilot wasn't the only one taking unacceptable risks that day. It's obvious that complacency and normalization of deviance exist on the part of several tour companies' management and pilots.

The image from the video makes clear that what occurred on the day of the accident wasn't inadvertent flight into IMC but deliberate. The commercial incentive to push through the clouds and continue the tour seemed to have outweighed the pilot's duty to conduct the flight safely. Most of the time, luck wins out and everyone survives, and so the practice continues. The harsh truth is that the absence of a crash, even for years, doesn't necessarily mean that things were being done right. Those same risk factors will come together again for the next flight.

The NTSB has asked for in-cockpit image recording for years. Modern technology makes this inexpensive and serves two purposes: crash reconstruction and, more importantly, crash prevention. Videos like these can pave the way for better safety programs and prevent more unnecessary deaths. Yet, I'm not confident that any tour company management saw these videos as an opportunity to step forward and make clear to pilots their commitment to risk management and safe operations. The pushback from pilots and companies about monitoring their own flight operations and taking *nonpunitive* corrective action is inexplicable to me, especially if the equipment is already installed.

Helicopters, especially small ones, are notoriously difficult to fly after visual reference is lost. The so-called proficiency checks for emergency escape from inadvertent IMC are ineffective and likely provide a false sense of security. The videos show that the escape mechanism available to most helicopter pilots, the ability to land almost anywhere in deteriorating weather, is often not available in the Waimea Canyon and the northern part of Kauai. The terrain is rugged and covered with trees that make a successful landing improbable.

Again, this is an area where there are known methods of mitigating the risk of spatial disorientation. Simulators or perhaps virtual-reality headgear that could be worn in an actual aircraft present more realistic training. Stability augmentation systems and basic autopilots would also improve the safety of VFR air tour helicopters. Economics is ever the driver of safety decisions for regulators and operators across all modes of transportation. But if you think prevention is expensive, do the math on the real cost of crashes.



In addition to showing the weather conditions encountered by the accident aircraft this image and similar ones from tour videos taken by helicopters operating nearby demonstrate the normalization of deviance by local tour companies and their pilots.

While both the NTSB and FAA proclaim the benefits of a systemic approach to managing safety, the FAA has ignored its own guidance. In an area where rapidly changing weather conditions are well known, real-time

weather observations for VFR air tours are essential. Again, cameras provide a relatively inexpensive technology to accomplish that. Likewise, having ADS-B and radio

The NTSB gets no satisfaction about being proven right once again. Instead, we want the FAA and operators to address the problem and end these types of accidents.

coverage in the area would allow for both collision avoidance and pilot reports that would enhance safety tremendously. An antenna is all that's needed. All these items have been recommended to the FAA for years.

The accident flight was in clear violation of the Hawaii Air Tour Common Procedures Manual (HATCPM), a document published by the FAA's Honolulu Flight Standards District Office (FSDO) that details standard procedures for air tours in that state. Updating the HATCPM and developing cue-based weather training are safety initiatives the FAA has said it would undertake. Despite years of delay, neither has been completed.

Part of a systemic approach to safety is looking at how management failures contributed to the accident chain. During our investigation, the NTSB determined

that the tour company's lack of safety management processes contributed to the accident. Going even further up the chain, we identified as a factor the FAA's ineffective monitoring of Hawaii air tour operators.

> The agency's Honolulu FSDO was set up to fail because upper management didn't provide it with the personnel or funding to allow for training, travel, and proper

oversight of air tour operations in the state. These are performance activities, as is piloting, that require the same attention to personnel qualifications and detail, along with a willingness to constantly self-evaluate.

The FAA has failed to address the safety issues in Hawaii that have been brought forward over the decades. But we can't let that agency's inaction limit our attempts to improve aviation safety. Why not have industry update the HATCPM and develop cue-based weather training, and then let the FAA sanction it? Tour passengers deserve that much!

The NTSB report on the Kekaha accident made 11 recommendations to the FAA—all of which had been made previously. But we get no satisfaction from saying, "We told you so." It's time to do better. •



## ADVOCATING FOR YOU

By Cade Clark, John Shea, and Emma Taylor

## Midterm Report: The Only Constant Is Change

A busy Congress keeps aviation issues in focus.

INCE THE LAST EDITION OF ROTOR, much has transpired that has informed US congressional and White House priorities. Foreign aid, energy security, monetary policy, and several other economic issues have been at the top of the congressional to-do list. Russia's invasion of Ukraine has had major ripple effects across the globe that have required close attention and careful responses. And, despite not being at the top of the list, aviation issues remain in

focus.

Congress has held discussions on a range of issues over the second quarter of 2022, including aviation noise, 5G interference with radio altimeters, priorities for the 2023 FAA

reauthorization bill, and climate change at airports. The appropriations season is in full swing as well, and

> Transportation Secretary Pete Buttigleg has been making the rounds on Capitol Hill to testify about the Biden administration's budget request.

As March drew to a close, the FAA appointed Billy Nolen acting administrator after former administrator Steve Dickson retired. Several other

leadership changes have transpired at the agency since Dickson's retirement, and many senior members of Congress have announced their retirements, adding to what is already expected to be an eventful midterm election.

#### A Greener Airspace System

Legislators on Capitol Hill have taken a considerable interest in creating a greener, more sustainable airspace system. Sustainable aviation fuel, often referred to as SAF, is one of the most effective ways to reduce

greenhouse gas (GHG) emissions for the aviation industry. President Biden recently reaffirmed his administration's commitment to increasing SAF production and recognized the important role SAF will play in helping the aviation industry achieve net zero carbon emissions by 2050.

HAI has been engaged in several recent initiatives to spur SAF production, and we're proud to be partners in the Biden administration's SAF Grand Challenge. Advancing the SAF Grand Challenge as well as the proposed SAF blenders tax credit and SAF grant program, which have passed the House of Representatives and are now pending in the Senate, will enable the federal government and the aviation industry to make significant strides in emissions reduction while supporting US job growth and energy security.

As you may recall, HAI hosted a two-part webinar series in fall 2021 to educate members about SAF's potential to support a more ecologically sustainable rotorcraft industry. Participants heard from industry experts and helicopter OEM representatives how the alternative fuel can benefit helicopter operators and increase business and how OEMs are exploring SAF's many capabilities. HAI members walked away from this webinar series with a deeper understanding of how SAF can safely and effectively decarbonize rotorcraft operations. (See p. 42 to learn more about the process of SAF production, distribution, and implementation.)

HAI also proudly supports the Eliminate Aviation Gasoline Lead Emissions (EAGLE) initiative, a comprehensive, public-private partnership comprising aviation and petroleum industry and US government stakeholders who are working toward transitioning to lead-free aviation fuels for piston-engine aircraft by the end of 2030 without compromising the safety or economic health of the general aviation industry.

The first EAGLE stakeholder meeting, which took place in March, was attended by representatives from

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aviation associations, aircraft and engine manufacturers, fuel distributors, the FAA, and the EPA.

The EAGLE initiative will conduct its activities under four pillars:

- Regulatory and Policy: Determining government policies and processes needed in areas such as fuel authorization, certification, lead emissions standards, and infrastructure as well as conducting outreach to industry stakeholders and international partners.
- Unleaded-Fuel Testing and Qualification: Determining the research, testing, and qualification necessary for a viable, safe, high-octane, unleaded replacement for 100 octane low lead (100LL) avgas and the issuance of an FAA-eligible fleet authorization.
- Research and Development: Determining research and testing, effective and timely certification of advanced technology designs, and evaluation of means of

- compliance and operational procedures to address the technical challenges associated with high-performance engines and unleaded fuels.
- Business Infrastructure and Implementation: Supporting policy and regulatory proposals for maintaining 100LL availability and airport access to ensure safety during the transition, and supporting standards and regulatory pathways to market for the production, distribution, and servicing of the new unleaded fuel, including government incentive and policy programs.

## Legislation Supporting eVTOL and Workforce Development

Several bills have advanced over the past few months focusing on creating policies, procedures, and programs to support future US eVTOL operations and workforce development. HAI has ardently supported this legislation





## ADVOCATING FOR YOU

continued



**Excluding critical** stakeholders from the development of Air Tour Management Plans over US national parks has led to plans that contain clear safety issues.

and applauds Congress for prioritizing the future of vertical flight by addressing some of the fundamental issues necessary to make advanced air mobility (AAM) a reality and fostering the success of the next generation of pilots and aviation technicians.

More than 50% of the current science and engineering workforce will soon hit retirement age, according to the FAA. We can't grow our industry without also cultivating a workforce to maintain it. HAI has had remarkable success working with our industry partners and federal and state governments to promote various aviation workforce development initiatives.

For details on the HAI-supported AAM and workforce development bills that Congress has approved, see "Recent HAI-Backed Legislation," opposite.

#### **Air Tours at National Parks**

The federal government's Air Tour Management Plans (ATMPs) will have a significant impact on the air tour segment of our industry. HAI, concerned about the

transparency of the drafting process, operational safety, and economic considerations of the plans, launched a campaign to assist members in submitting comments on the proposed ATMPs. The comments outlined the industry's concern that the ATMP process is moving forward without the involvement of critical stakeholders such as the National Parks Overflights Advisory Group.

Excluding critical stakeholders has yielded plans that contain clear safety issues that would severely curtail the economic viability of the air tour industry. Please share with your elected officials your thoughts on this important matter.

#### 5G Concerns Linger while Progress Made

Aviation and telecommunications industry stakeholders and regulators are working together around the clock to resolve issues surrounding spectrum interference with radio altimeters.

The rotorcraft and business aviation industry are far from out of the woods, but progress is being made on



filters that can be installed on aircraft. including helicopters, that will drastically reduce the negative impact of 5G interference. Some suppliers have already begun filling purchase orders for airlines. Production is underway, but supply chain problems and other factors will limit widescale availability in the near term.

Filters may not be a workable solution for all rotorcraft, but they're just one idea HAI is exploring with our industry and government partners.

We're also seeking to expand relief for night-vision goggles (NVG) operations; working with our OEM members on technical solutions and alternative means of

compliance; and canvassing Capitol Hill to educate members of Congress about the 5G issue and lay the groundwork for relief that may be needed from the legislative branch.

Fortunately, confirmed incident reports of 5G interference involving rotorcraft have been minimal, according to the FAA. As

#### Recent HAI-Backed Legislation

#### **AAM**

#### H.R.6270, The Advanced Aviation Infrastructure Modernization (AAIM) Act

- Approved by House Transportation and Infrastructure Committee on Apr. 28.
- Establishes a two-year pilot program to invest \$25 million in competitive grants for vertiport and related infrastructure development.
- Senate companion bill passed by the Senate Commerce, Science and Transportation Committee in May.

#### S.516, The Advanced Air Mobility Coordination and Leadership Act

- Passed in the Senate on Mar. 23.
- Directs Department of Transportation to create an interagency working group composed of leaders from key government agencies.
- The working group will work with various stakeholders, including aviation operators and manufacturers, airports, labor groups, consumer groups, and first responders, to develop recommendations that will guide the federal government's role in AAM.
- House companion bill passed in November 2021.

#### **WORKFORCE DEVELOPMENT**

#### H.R.3482, National Center for the Advancement of Aviation Act of 2021

- Approved by House Transportation and Infrastructure Committee on Apr. 28.
- Establishes a federally chartered, private entity to support and promote the civil aviation and aerospace workforce.
- The center will serve as an education research repository and a national independent forum for collaboration on workforce issues.
- Calls for provision of resources for scholarships, apprenticeships, curriculum development, and other outreach efforts.

#### Aviation Workforce Development Grant Program

- Annually provides \$5 million to support education of future aircraft pilots and \$5 million to support education and recruitment of aviation maintenance technical workers.
- HAI worked to establish this bill in the last FAA reauthorization bill signed into law and continues to ensure the program remains fully funded.
- Congress approved the program through the end of fiscal year 2023, at which point it will need to be reauthorized.

#### State-Level Rotor Pathway Programs

- These programs continue to be one of HAI's top priorities for reaching the next generation of aviators.
- HAI helped found a state pathway program in Utah that receives \$320,000 in perpetual Strategic Workforce Initiative grants.
- The Utah program received national recognition in 2021 when it was honored with the National Association of State Aviation Officials Center Aviation Education Program Award.
- HAI is working with multiple stakeholders to set up similar pathway programs for secondary-education students across the country.



## ADVOCATING FOR YOU

continued

more towers get turned on and new service providers enter the 5G market, we're optimistic the US government and our industry partners will make the necessary investments to ensure that safety is maintained.

#### **Uncrewed Aircraft System (UAS) Integration**

HAI's helicopter operator members continue to realize the benefits drones can bring to their business and are adding more uncrewed aircraft systems (UASs) to their fleets every year.

As the world's leading voice for the VTOL industry, HAI has been at the forefront of all major policy discussions related to the integration of drones into the US National Airspace System (NAS).

HAI's long-standing history of promoting safety in vertical flight has established our organization as a trusted source of information on significant policy proposals. To that end, we recently participated in the FAA's Unmanned Aircraft Systems Beyond Visual Line-of-Sight (BVLOS) Operations Aviation Rulemaking Committee (ARC), whose formation the agency announced in June 2021.

The ARC primarily comprised UAS manufacturers, suppliers, and operators as opposed to stakeholders from traditional crewed aviation segments. Its members developed recommendations for integrating UAS BVLOS operations into the NAS, and HAI played an important role in pushing back on shortsighted proposals that would compromise safety and erode well-established and widely understood operational norms. One such recommendation in the ARC report that HAI adamantly opposed regards changes to right-of-way rules.

Traditionally, right-of-way is based on maneuverability and the ability to see (detect) and avoid, but the ARC report proposes no detect-and-avoid requirements for UASs and instead places the burden entirely on crewed operators. This omission presents a myriad of safety concerns that HAI outlines in our dissent report at rotor.org/advocacy. Congressional committees took note of HAI's position on the right-of-way issue and other shortcomings in the BVLOS report when they invited us to brief them within days of the report's release in March 2022. HAI and other stakeholders are committed to improving these policy proposals before the rulemaking process begins.

#### What's Next?

With the 2018 FAA Reauthorization Act expiring next year, HAI and other aviation organizations are formalizing their priorities for the next FAA reauthorization bill. This is the first step in a long and arduous process of working with Capitol Hill and our industry partners to ensure that the next bill that gets signed into law helps move the industry forward. Safety, sustainability, infrastructure, certification, workforce, and AAM: these are just a handful of the many high-level issues that will be addressed in the legislation.

We encourage HAI members to engage with HAI's working groups and to reach out directly to HAI's Government Affairs team on the issues that matter to you. Contact us at GovernmentAffairs@rotor.org for assistance. Next year may seem like a long way off, but we have a lot of ground to cover with a new Congress.

#### **Our Request of You**

During this stretch of the legislative calendar before the August recess, Congress will look to get as many of their legislative priorities over the finish line as possible so they have ample time to spend on the campaign trail.

Now is a great time to contact your elected officials and set up a meeting with them. Whether or not you have a personal relationship with your members of Congress, connecting with them can be highly beneficial. One of the best ways to develop or strengthen a relationship with your elected officials is to invite them on a tour of your business.

HAI has helped facilitate tours for representatives and their staffs at HAI member companies on many occasions, and we're always here to assist in the process. Don't hesitate to reach out if you would like us to help facilitate a congressional-delegation tour of your facility! Contact us at advocacy@rotor.org for assistance.

Remember, elected officials expect to hear from their constituents about the opportunities and challenges they face. HAI members have great stories to tell about how their work in the vertical flight industry contributes to society.

As your trade association, HAI advocates for your interests before legislators and regulators. But we need you, our members, to help form those personal connections!

# ROTORWASH

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

#### HAI BRIEFS

#### Meet HAI's 2022-23 Board of Directors

HAI WELCOMES ITS 2022–23 BOARD of directors on Jul. 1, including one new board member and a new special advisor.

Jeffery Smith of R.O.P. Aviation, who becomes HAI's 2022–23 chair when the new board is seated, and Director Stacy Sheard of Executive Jet Management/
Fanatics were reelected to their general aviation and commercial aviation seats, respectively. (To read more about Smith and his plans for HAI for the coming year, see p. 28.) The entire 2022–23 HAI Board of Directors is pictured on p. 17.

Joining the board this year is Robert Miller Stallings, a sales representative at Titan Aviation Fuels, who replaces Jack Matiasevich of Southern California Edison Co. in a general aviation operator seat. Also coming on board is Francois Lassale, CEO of Heli SGI in Denpasar Selatan, Bali,

HAI created the board position of special advisor – international in an effort to extend its global reach.

Indonesia, who was appointed to serve in the newly created position of special advisor – international.

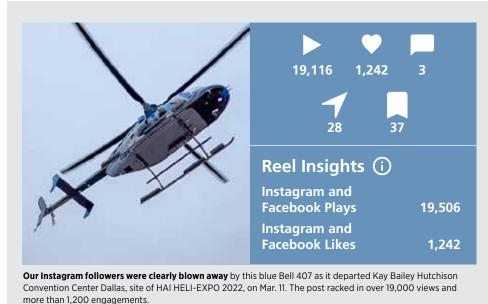
Stallings began his aviation career at a very young age when he started working for his local fixed-base operator in eastern

North Carolina. After graduating from the University of North Carolina at Chapel Hill, he began selling aviation fuel and insurance for his family's business, Titan Aviation

> Fuels. Obsessed with flying, Stallings soon achieved both his fixed-wing and helicopter ratings. Today, he flies Titan's Bell 407 helicopter.

"Flying helicopters is my passion, so I'm enthusiastic about being elected to the HAI Board of Directors," says Stallings. "I look forward to serving on the board in order to build awareness of the rotorcraft community for the successful future growth of the industry."

The HAI board's decision to appoint >





> a special advisor - international is part of the association's efforts to extend its global reach. As a pilot and executive, Lassale brings an extensive international background to the role. He served as CEO of HeliOffshore before becoming CEO of Heli SGI earlier this year and has also been vice chairman of the European Helicopter Association as well as a board member and Corporate Aviation Management Committee member of the National Business Aviation Association. Prior to his civilian career, Lassale served as an infantry officer in the South African Defense Force and as a pilot in the Royal Air Force.

"This position, utilizing the network, collective strength, and collaboration of HAI and its members, will more effectively support the sometimes unseen, smaller international operators around the world." Lassale says. "It will also enhance the sharing of lessons learned, experience, and training from all corners of the world to create more synergy across the industry."

The new board is already looking ahead. "I'm very enthusiastic about this diverse board, which represents many different segments of the vertical lift industry," says incoming HAI Chair Smith.

#### HAI BRIEFS

#### **HAI Introduces 2 New** Member Benefits

HAI IS PLEASED TO ANNOUNCE two new benefits for US-based members: comprehensive health insurance, and loss-oflicense insurance for pilots and AMTs holding FAA-issued licenses.

#### Comprehensive Health Insurance

Powered by LIG Solutions, HAI's health insurance program is designed to help individuals, families, businesses, and groups affordably find and enroll in health-care products that directly meet their individual needs.

"Contracting, part-time work, traveling,

risk of injury—all of these are common situations in our industry and often make it hard to find affordable health insurance that meets specific needs," says HAI President and CEO Jim Viola. "HAI's partnership with LIG allows us to help our members find the best health-care solutions for themselves, their families, and their businesses at prices they can afford."

Not the typical one-size-fits-all offering, HAI's solution works with you to navigate the health insurance marketplace to find products that meet you or your company's specific needs, lifestyle, and budget. Plans include coverage options from national, regional, and local insurance carriers. Products available through HAI's program

- Comprehensive major medical for individuals and families
- Critical-care coverage
- Medicare Advantage and Medicare Supplement plans
- Supplemental insurance
- Pharmacy program with set low prescription prices
- Dental coverage
- Vision coverage
- Accident medical plans
- Disability income protection
- Short-term policies
- Health reimbursement arrangement (HRA) business/employee programs.

To learn more or to sign up for a free, one-on-one consultation with a licensed LIG agent, HAI members can visit ligmembers.com/hai.

#### Loss-of-License Insurance

Offered through Lockton Companies, HAI's new loss-of-license insurance is available for individuals as well as companies that want to offer the benefit to their eligible employees.

"HAI members have very real concerns over loss of income when their ability to perform their duties under their FAA-issued licenses is temporarily or permanently

prohibited due to a medical condition," says Viola. "We are pleased to offer this benefit through Lockton to help protect our members' hard-earned livelihoods while they get back on their feet."

Two loss-of-license insurance options are available to HAI members: temporary loss-of-license insurance and permanent loss-of-license insurance.

Temporary loss-of-license insurance protects policyholders against the inability to fly or maintain aircraft due to injury or illness for a short period of time. This insurance helps offset lost income with monthly payouts equal to a majority percentage of the policyholder's salary for a set number of months.

Permanent loss-of-license coverage protects pilots and AMTs against careerending injuries or illnesses or the permanent loss of license due to a medical condition. Before benefits are payable, a physician must certify, after a waiting period, that the injury or illness is career ending. The individual covered by the policy then receives a lump-sum payout.

Permanent loss-of-license benefits can be coupled with a temporary loss-oflicense policy, to be payable after the monthly temporary benefit ceases.

To learn more about HAI's new loss-oflicense insurance benefit, including the details of coverage and cost, visit rotor.org/ benefits.

#### HAI BRIEFS

#### **HAI International Trip Builds Relationships**

SINCE TAKING THE HELM OF HAI in 2020, HAI President and CEO Jim Viola has focused on increasing HAI's international presence and support. This work has begun to pay off, with a partnership agreement between HAI and the European Helicopter Association (EHA) and, more recently, with HAI being chosen as the provider of EUROPEAN ROTORS 2022, Europe's >

## **HAI 2022–23 Board of Directors**



CHAIR **Jeffery Smith** R.O.P. Aviation Teterboro, New Jersey, USA General Aviation



VICE CHAIR B. Adam Hammond Tennessee Valley Authority Knoxville, Tennessee, USA Government Service



TREASURER **Nicole Battjes** Rainbow Helicopters Honolulu, Hawaii, USA Commercial Aviation



**ASSISTANT TREASURER** Mark A. Schlaefli Dakota Rotors LLC Custer, South Dakota, USA Commercial Aviation



PRESIDENT AND CHIEF EXECUTIVE OFFICER James A. Viola Helicopter Association International Alexandria, Virginia, USA



AND CORPORATE SECRETARY Roxanne R. Fox Helicopter Association International Alexandria, Virginia, USA



DIRECTOR **Brian Jorgenson** Timberline Helicopters Sandpoint, Idaho, USA Commercial Aviation



DIRECTOR Rick Kenin Boston MedFlight Bedford, Massachusetts, USA Commercial Aviation



DIRECTOR Randal R. Rowles Helicopter Institute Inc. Fort Worth, Texas, USA Commercial Aviation



Stacy Sheard Executive Jet Management/Fanatics Philadelphia, Pennsylvania, USA Commercial Aviation



DIRECTOR **Robert Miller Stallings** Titan Aviation Fuels New Bern, North Carolina, USA General Aviation



**LEGAL ADVISOR** H. Bryan Brewer III Crowell & Moring LLP Washington, DC, USA



SPECIAL ADVISOR-**EMERGING TECHNOLOGY** Jonathan Daniels Praxis Aerospace Concepts International Searchlight, Nevada, USA



SPECIAL ADVISOR-INTERNATIONAL Francois Lassale Heli SGI Denpasar Selatan, Bali, Indonesia

> premier helicopter convention.

To build on this work and promote the event, Viola and HAI Board of Directors Chairman-elect Jeff Smith flew to France in May. The pair met with EHA Chairman Christian Müller; EHA Vice Chairman Thierry Couderc; David Solar, head of the general aviation and VTOL department at the European Union Aviation Safety Agency (EASA); and Thierry Basset, president of the French Helicopter Group (GFH).

Together, this international team attended L'Hélico 2022, France's renowned helicopter fly-in event in Cholet, where more than 125 helicopters were on exhibit. While there, Viola and Smith spoke to HAI members and nonmembers alike to learn firsthand about specific issues the European industry experiences. This information will increase HAI's understanding of how to help its international members collaborate with regulators, improve safety, and supercharge their educational programs. The pair also promoted EUROPEAN ROTORS 2022, gathering valuable insight on what potential attendees would like to

gain from the event while building awareness.

"HAI HELI-EXPO isn't enough to properly serve our international members," Smith says. "We have to really understand them and meet them where they are. That means international work and support."

From Cholet, the team went on to Marignane, France, where they toured the Airbus Helicopters factory and met with company CEO Bruno Even. Then, it was on to Pau, France, to visit Safran Helicopter Engines, tour its facility, and meet with its CEO, Franck Saudo.

"Airbus and Safran are an incredible support to HAI, and talking with them about how we can better support their work and the international industry was invaluable," Viola savs.

The final stop of the tour was Mollis, Switzerland, where the international team met with Heli-Linth, a local logging helicopter operator, to learn more about its operation and the overall experience of operating in the region.

"We met a lot of different helicopter

operators and learned about their needs and frustrations on this trip," Smith says. "There are some very unique regulatory issues in Europe that don't exist here in the US. At the top is ICAO [International Civil Aviation Organization]; then, EASA oversees the entire European Union; then, each country has its own regulatory agency. This can create a lot of work between countries and for operators operating across borders.

"There is so much HAI can do to help, especially through VAST [the Vertical Aviation Safety Team]. There's no better captain of the ship at HAI than Jim [Viola] to help navigate this issue. I watched him use his background in the FAA and working with regulatory bodies to envision paths through these issues with real, usable solutions," adds Smith. "I'm very enthusiastic HAI can really help in these areas, and we absolutely have the best people at HAI for that job."

"It was good to visit different countries and operators from all over the region," Viola says. "We also created a better understanding of the relationship between

> EHA and HAI. EHA represents Europe while HAI represents the world. When EHA can't help its members, HAI can step in and lend assistance.

"There is such a cultural difference across parts of the world. What works in the US may not work in Asia. What works in China may not work in Australia. And now, with Brexit, the UK is separate from EASA," Viola continues. "The international support HAI can provide to help connect all these regions and help them navigate issues to create successful solutions is vital for the sustainment and growth of our industry." ?



While in France attending L'Hélico 2022 last month, Jeff Smith (with hat) and Jim Viola (in black shirt) met with (from left) EASA's David Solar, EHA's Christian Müller and Thierry Couderc, and Thierry Basset, president of the French Helicopter Group (GFH).



Helicopter Association International

# 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 Jen Boyer



## **Mitigating High-Risk Operations**

**RISK MITIGATION IS A CRUCIAL STEP IN ANY HELICOPTER OPERATION.** High-risk operations, by virtue of the name, carry a higher-than-usual number of potential hazards and require a deep focus on risk mitigation to help ensure a safe outcome. Operators conducting tricky canyon rescues, flying skiers to fresh snow, building a transmission tower, and the like succeed when they take time to identify and mitigate possible hazards and make educated decisions regarding risk with all the players involved.

Below are five valuable dos and don'ts about risk mitigation, gathered in part from heli-ski operator Powderbird, which works in and around the mountains of Utah performing skiing and avalanche control in the winter and firefighting in the summer.

DO a thorough pre-mission risk assessment.

Before conducting a preflight inspection, take a close look at every possible element of the flight activity, even if it's one your operation does regularly. This includes evaluating current and anticipated weather during all phases of the operation. What's the visibility? Will there be glare or brightout? Is there an inversion that can bring clouds up from the canyons quickly? Where's the wind? Will there be mechanical or convective turbulence? Consider the hazards of the landing and operating areas, and identify potential emergency landing sites, again identifying

possible hazards. Is this an avalanche/rockslide zone? Is there adequate main- and tail-rotor clearance? If landing in snow, how are the snow conditions? Can the helicopter land on top of the snow or will it sink? If landing at altitude, how's the density altitude that day? Can the aircraft operate safely within the hovering out of ground effect (HOGE) ceiling at the required weight with fuel, passengers, and equipment? If not, what mitigations can you implement? By carefully reviewing every aspect of the flight and potential dangers, you can plan for mitigating each related risk.

DON'T exclude any team members. A full risk assessment must include every participant in the flight and supporting activities. If you have government agencies, customers, and/or subcontractors involved, include them in hazard identification and risk assessment. What are their teams' experience? What equipment not in the helicopter operator's control will be involved? What are the potential risks involved with that equipment? What items have they considered that you might have overlooked? These team members, who include not only those participating directly in the flight but also those with auxiliary insight, such as maintenance techs, dispatchers, and executives (the latter of whom are instrumental in understanding and supporting safety decision-making for the mission), will have their own unique insights about risks and potential mitigation solutions. Ensuring that all who have a hand in the operation are involved in risk identification and mitigation significantly boosts safety on any flight.

**DO mitigate each risk.** With the risks identified, carefully review each one for mitigation strategies. In some cases, a plan for one risk can help lower others. However, beware of instances in which mitigating one risk can uncover an entirely new hazard. In an ideal world, every risk would be mitigated to green, clearing the way for smooth sailing. Unfortunately, we don't live in an ideal world. Instead, a safety-conscious operation will bring in every participant to discuss and agree on mitigation options that will lower the residual risk to a level considered as low as reasonably practicable (ALARP). At this point, the residual risk is acceptable and the flight can be deemed safe to proceed. But first, review the mission's overall risk again, keeping in mind how mitigations can affect each other.

**DON'T overlook best practices.** In this day and age, chances are someone has executed an operation much like the one you're about to perform. Even if you've performed a flight like this in the past, take the time to look up best practices and lessons learned from other operators they're always changing for the better. Operators who research and formally adopt global best practices for risk mitigation and safety greatly reduce their risks. HAI is a good source of information on best practices. Operators can visit rotor.org/safety for resources, safety tools, and HAI safety programs. Additional resources include the US Helicopter Safety Team (ushst.org) and the Vertical Aviation Safety Team (vast.aero).



**DO perform pre-mission planning**. Once the team has identified every possible flight risk, gather with everyone involved in the mission—pilots, controllers, linepeople, ground crews, and any others—and carefully go through every step of the plan. Visual aids such as maps and photographs are exceptionally valuable here, in case anyone is unclear of exactly where the various actions during the flight will take place. During this planning period, discuss the weather and the identified risks that might occur along the way. Make sure everyone has a thorough understanding of the whole flight operation, including points throughout the trip where go/no-go decisions to continue or discontinue the flight will be made. Always dedicate time for questions and be sure to answer them all before departing.

Thanks to Kevin O'Rourke, VP of operations at Alta, Utah-based Powderbird. O'Rourke shared how his company mitigates risk in the Mar. 4, 2021, HAI@Work webinar "Mitigating High-Risk Operations." A veteran of mountain operations. O'Rourke shares in the webinar how his team walks through a mission and identifies and mitigates risk. Watch the full webinar at bit.ly/3NqVdnS.

#### INTHESPOTLIGHT

By Jen Boyer

## Allison McKay, CEO, Women in Aviation International

The urgent need to attract women to, and retain them in, rotorcraft careers.

ITH THE EXCEPTION OF FLIGHT ATTENdants, women make up less than 20% of the aviation workforce. In an effort to improve this statistic, the FAA Reauthorization Act of 2018 mandated the creation of a Women in Aviation Advisory Board (WIAAB).

The board was formed to provide independent recommendations to the FAA on how to encourage more women to pursue aviation careers and how to retain women in the industry. Thirty female aviation professionals were selected to join the board in 2020.

"Men don't ask whether they can juggle a family and an aviation career. What are we doing that causes women to feel they can't?"



For the next two years, the group worked to review, research, and identify strategies to overcome barriers to women in aviation, culminating in its March 2022 report, Breaking Barriers for Women in Aviation: Flight Plan for the Future. The report highlights key obstacles standing between women and aviation careers as well as ways to engage young women early, foster a passion for aviation, and support women in entering and remaining in the industry.

Of the 30 women on the WIAAB, the vast majority represented the commercial airline market, and not one was employed in the helicopter industry. But one did possess rotorcraft industry experience: Allison McKay.

McKay applied to the WIAAB in 2019, when she was VP of Helicopter Foundation International (HFI), an arm of HAI. Before joining HFI in 2015, she served as Safran's public affairs director for 13 years. By the time the



board's members were chosen, McKay had moved to nonprofit Women in Aviation International (WAI) as CEO. There, McKay directs programs that expose girls to aerospace careers and provide education and professional development resources for women working in all aspects of aviation.

## **ROTOR:** What did you and the other members of the WIAAB set out to do?

**McKay:** Our charge was to identify barriers to women's entry into the aviation field, give recommendations on how to address those obstacles, and then address the issue of retention—how do we keep women in the industry once they've decided on that career path?

I don't think our findings surprised anybody on the board in terms of the fundamental issues about getting more women interested in aviation.

Female representation in the industry has historically been so low that a lot of times it's hard to find somebody, a mentor or someone you may know growing up, who's in the industry and can provide you with the pathway or information you need to decide what you want to do with your career.

Then again, the culture of this industry has been a deterrent to keeping women in it. Whether women have a passion for aviation or not, we as an industry don't really help women grow throughout their careers, even though we send them messages that we welcome them in aviation.

Some of the recommendations we made, especially for retention, are things that not only the FAA and DOT [US Department of Transportation] are responsible for, but that the industry as a whole can adopt to create a culture conducive to keeping both men and women employed and growing in their careers.

#### Which recommendations stood out most to you?

On the pilot side, the notion of work-life balance is incredibly important. While I've been at WAI, I've talked to a number of high school girls and early-college women. A lot of them ask questions starting with, "Can I ...?" "Can I be a pilot?" "Can I fly and also have a family?"

The hard part about those questions is these women don't have anybody in their daily lives they can ask aviation-career questions of or watch to see how it's done. They don't see a mother who's a pilot. That's a really big concern for them. They don't want to have to choose between having a family and a flying career. They want to do both and want to know how to do it.

On the WIAAB, we developed a lot of recommendations addressing those

concerns. How does the industry create a culture and policies that allow women to have both a family and a career in a way that doesn't make them feel like they have to choose one or the other?

The topics our recommendations addressed included health care, familyleave accommodations, and flexible schedules. None of these recommendations qualifies as outside-the-box thinking. It's just that we haven't really adopted them industrywide yet.

Some organizations are at the forefront of that movement, but across the board, [our industry makes] it very difficult for women to have both a family and a career. I always come back to the fact that men don't ask whether they can do both. What are we doing that causes women to feel thev can't?

The other really big piece is getting more young people involved in the industry. That requires a lot more promotion of aviation to the next generation.

Rarely do teachers or counselors in schools-elementary, middle, and secondary—really understand that this is an industry that's starved for talent. [Editor's note: According to the WIABB report, Boeing forecasts that over the next 20 years, 612,000 new civilian pilots, 626,000 new maintenance technicians, and 886,000 new cabin crew members will be needed worldwide.1

There's a need for a huge influx of aerospace workers over the next 20 years, and we have to start educating parents, counselors, teachers, and the kids themselves that regardless of what you want to do with your life, you can do it in the aviation



#### INTHESPOTLIGHT

Continued

industry.

People think of pilots and maintenance technicians, but there's so much more to aviation. You can be a writer, photographer, project manager, marketer. You can enter finance, human resources, government relations, management, leadership, airport operations almost every field you can think of.

With the exception of flight attendants and probably those who work in human resources, every industry segment, every career path, has a very large imbalance of gender and racial diversity.

#### How do these insights relate to the vertical flight industry in particular?

It was pretty clear that rotorcraft representation was lacking on the WIAAB. To me, that's a huge concern for the aviation industrv overall.

Commercial airlines get a lot of attention and a lot of press about their hiring needs across the board, and they're well funded and able to mobilize and hire people at a much higher rate than the vertical flight industry. I'd hate for rotorcraft to struggle the most with getting talent, because there are so many different segments in the industry that need highly skilled and trained workers.

Some massive concerns haven't been well addressed within the rotorcraft community alone. Look at maintenance technicians, for example. The number of AMT schools with equipment to train students on a helicopter or spend any time focused on helicopters is minimal. Yet we expect these students to get their A&P and get a job with a helicopter operator.

Operators want someone who knows how to work on a helicopter, but if you can't give students that training within their own schools, how are we going to have



Sixty-four percent of women currently in aviation had chosen the career by age 20, indicating the importance of exposing girls to aviation early in life.

enough technicians in that segment to fix

Workforce development is a real issue for helicopters as a whole. Some operators are making strides creating programming and building recruiting efforts, but the helicopter industry in general is behind. There's a real opportunity to create workforce development initiatives industrywide and expand them to attract and retain more women.

And we need to gather data. There isn't even a way to look up how many female helicopter pilots or helicopter maintenance technicians there are today. The FAA can do a better job of fostering these initiatives by making that data available.

#### What are the next steps?

The WIAAB was dissolved once our report was made public. We're looking at government affairs and communications efforts in which the now-defunct board's members will meet with their congressional representatives to promote the findings of the report and get buy-in from constituents. In addition, we're trying to mobilize a communication plan concentrating on social media and advertising to show the public that our

industry is in need of talent.

Social media—whether YouTube or TikTok or Instagram is important because it reaches kids where they are. We want to start using some of these platforms' influencers to help us engage that next generation.

And one of our recommendations was to create a full-time board focused on pushing some initiatives forward. The new, fulltime board we're recommending would be a different group of women, representing different industry segments from diverse backgrounds and professions. We don't want our report to just sit on a shelf. I'd love to see some connected and active heli-

copter industry women participate.

#### Any final thoughts?

Overall culture is incredibly important, and it's also incredibly difficult to change. It's not something that happens quickly, but I think the WIAAB's findings have been well received.

The aviation industry is mobilized in a positive direction. There's a lot of energy focusing on diversity, equity, and inclusion initiatives.

We have to start having these conversations. It's going to take every single aspect of this industry to effect change.

If you look at the number of women who are pilots or maintenance technicians or are in the C-suite or any other position, that number hasn't changed in the past decade-plus.

We really have to get bold as an industry, and we have to be serious about it if we want to attract as many people to the aviation workforce as the projections predict we'll need.

We can't rely on the same old methods of attracting and retaining talent in this industry. 🕞

## ROTORCRAFTEVENTS

#### 2022

#### JUL. 6-10

#### 2022 Ninety-Nines International Conference & Career Expo

The Ninety-Nines Charleston, South Carolina, USA Learn more at ninety-nines.org

#### JUL. 23-24

## 16th Annual Electric Aircraft Symposium

Vertical Flight Society
Oshkosh, Wisconsin, USA
Learn more at vtol.org

#### JUL. 25-30 APSCON / APSCON Unmanned 2022

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

#### JUL. 25-31 EAA AirVenture Oshkosh 2022

Experimental Aircraft Association Oshkosh, Wisconsin, USA Learn more at eaa.org

#### SEP. 5-9

#### 48th European Rotorcraft Forum

Vertical Flight Society Winterthur, Switzerland Learn more at vtol.org

#### SEP. 6-8

#### **Commercial UAV EXPO**

Commercial UAV News Las Vegas, Nevada, USA Learn more at expouav.com

#### SEP. 7-8

#### Helitech Expo 2022

London, England, United Kingdom Learn more at helitech.co.uk

#### SEP. 20-22

#### 6th Workshop on AAM Infrastructure

Vertical Flight Society Dayton, Ohio, USA Learn more at vtol.org

#### **SEP. 24**

## 8th Annual International Girls in Aviation Day

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HAI

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## Jeff Smith

## Giving Back

New HAI chair will expand association's global reach, voice.

By Paul Koscak

OU COULD SAY TOM CRUISE SENT JEFFERY Smith on a 36-year aviation journey. In 1986, Jeff, who will become the 2022–23 chair of HAI's Board of Directors on Jul. 1, was like most high school seniors, wondering what to do with his life. After seeing *Top Gun* that year, Jeff was sold. "I knew that's what I wanted to do," he recalls about the movie starring Cruise as a young naval aviator.

Jeff visited a US Navy recruiter to pursue his career choice, but his spirit fizzled when he learned he needed a four-year college degree to fly jets. At the time, college wasn't feasible for Jeff, but the recruiter referred him to the Army instead. That service branch was accepting nondegreed applicants to fly helicopters under its "From High School to Flight School" program.

The Army had already been a way of life for Jeff; his father, a Korean War veteran, had spent 28 years in the service. Along the way, the younger Smith had ample time to learn about Army aircraft. "My favorite was the Cobra," he remembers. He applied to become an Army helicopter pilot and was accepted even before graduating high school, through the delayedenlistment plan.

#### **Early Career Years**

As an Army pilot for 10 years, Jeff flew the OH-58 Kiowa and UH-1V Huey during assignments in North and South America, Europe, and the Middle East. During his military career, he flew attack, air cavalry, general support, and air ambulance missions and served as an instructor, safety officer, and operations officer.

As in many careers, there are mentors who coach colleagues over workplace hurdles. So, too, in the military. Jeff credits his commander for the guidance he provided in helping Jeff balance work and family responsibilities while Jeff was in the Army.

"I was very young and had already started a family with two adopted boys, so I was dealing with a lot of home issues," he recalls. "[My commander] helped me through that, and I give him credit for guiding me toward becoming an officer."

Upon leaving active duty in 1997, Jeff took a job with Liberty Helicopters conducting sightseeing tours in the New York City metropolitan area. He soon became a Part 135 captain flying a range of helicopters: the 206L-1, AS350B and B1-3, AS355, AS365, EC120, and EC130. He went on to become the assistant chief pilot, as well as heliport manager and safety officer, at Liberty—all in just four years.

After his time at Liberty, Jeff worked for several other aeronautical companies, including the now-defunct Executive Airlines in Farmingdale, New York, where he managed a variety of fixed- and rotary-wing aircraft.

"I started as the lead helicopter captain and quickly progressed to chief pilot and then director of operations," Jeff says. "Executive Airlines gave me the best experience of running a Part 135 company because I was always arguing regulations, like weather calls, duty times, 135 versus 91 trips, with the main principal. I was in my FAA liaison's office so much that we became good friends."

In 2001, Jeff started his own company, Integrated Aviation Group, flying a Dauphin with the helicopter's owners. He hired one of his Operation Desert Storm colleagues from his Army days and together they obtained a Part 135 IFR certificate and added an S-76 to the business. The company was dissolved when the helicopters were eventually sold.

Jeff accepted a position with R.O.P. Aviation in Teterboro, New Jersey, in 2005 flying an S-76C+, AW139, and Gulfstream G550. There, as in his Army career, he had a benefactor. This time, that individual helped Jeff accelerate his way to a G550 type rating.

"It was an incredible show of loyalty, one that I will never forget and plan to always reciprocate. I flew the Cessna 172, the BE76 Duchess, and then right into the 550."

In addition to his G550 rating, Jeff holds a helicopter multi-engine with instrument certificate as well as an ATP (airline transport pilot) and an AW139 type rating.

While he's amassed an outstanding resume as a pilot and manager of pilots, Jeff's not one to be satisfied with just building his career. Today, he's R.O.P.'s chief pilot, but he's also an aviation enthusiast dedicated to advancing the entire helicopter industry.

### **Vertical Flight Industry Struggles to Fill Vacancies**

There's an urgent need in the vertical flight community for pilots and aviation mechanics/engineers, and the industry needs to find solutions soon, before the shortage becomes an emergency.

That's how Jeff Smith. 2022–23 chair of HAI's Board of Directors, characterizes the vertical flight industry today. The industry must be prepared now to address, and take part in, workforce development, he urges.

For decades, the main source for filling aviation jobs was the military. "The military pipeline was always the source for pilots and mechanics, especially coming out of Vietnam," Jeff notes. "They were already trained and had no loans [burdening them]."

In the 1980s, about two-thirds of professional pilots got their training in the military. Now, that number has been reduced. All branches of the military have undergone force reductions, so the population of pilots and maintainers leaving the military has declined. Furthermore, vets are sometimes leaving the service with less flight or mechanical experience than before.

Fortunately, vertical flight careers offer a road map for each industry specialty. "If you want to fly offshore, fly fire or corporate, there are clear steps to take to get there," Jeff adds.

Aspiring helicopter pilots first attend a flight school to get their ratings. These are generally expensive to obtain, but one way to keep training costs low is to earn your ratings in an airplane first and then transition to helicopters. "It'll be a lot cheaper and make you more marketable in the long run," Jeff notes.

Most new pilots then immediately become instructors,

usually at the same school, to accumulate hours, proficiency, and confidence. The next step could be to take a job as a line pilot for an air tour operation, usually flying single pilot.

"This is an excellent way to gain experience and network in the industry to find that next position," Jeff says. The goal is to accumulate at least 1,500 hours, which is generally the minimum requirement for commercial pilots' insurability. At that point, a pilot can move up to a twin-engine turbine and a corporate position.

Aviation mechanics/engineers can obtain their required training in two ways: attending an approved Part 147 or equivalent program or through apprenticeship programs that offer on-the-job training under the supervision of licensed mechanics/engineers. "They may go from washing helicopters to more advanced tasks under the review of an A&P," Jeff says.

One obstacle for the vertical lift industry in filling maintenance positions is that many maintenance training programs focus solely on fixed-wing aircraft, meaning their newly minted graduates may not consider positions with rotorcraft operators or maintenance facilities.

To fill their pilot and maintenance vacancies, the vertical lift industry must find creative solutions to compete with the enticing employee benefit packages offered by regional

Jeff has personally mentored many aviation professionals. He especially encourages women to consider aviation careers, and he supports women's aviation organizations such as Whirly-Girls: "I've had a successful career, and I want to give something back."



#### Serving the Helicopter Community

Jeff brings considerable experience and expertise to his new role as chair of the HAI Board of Directors. From 2006 to 2008, he chaired an FAA ad hoc committee providing recommendations on redesigning the complex metropolitan New York City airspace.

Following a fatal midair collision over the Hudson River between an airplane and a helicopter in August 2009, he served on the New York Airspace Working Group convened by the FAA to review operating procedures in the

area. Their work contributed to the FAA's establishment of a Special Flight Rules Area (SFRA) in November of that year.

For Smith, the accident was personal. "The helicopter pilot was Jeremy Clarke, who flew for Liberty Helicopters. I had dinner with him two nights before. He was a happy Kiwi [New Zealander] and was engaged to be married."

Jeff's experience with New York airspace proved valuable during the annual opening of the United Nations' General Assembly, which typically includes a presidential visit, creating a citywide TFR (temporary flight restriction) lasting up to three weeks. He was able to negotiate an exemption with the US Secret Service, Transportation Security Administration, and the FAA allowing helicopters to fly inside the TFR.

Jeff has served on several

FAA task forces dealing

with airspace or access

restrictions in the New

York City metropolitan

area. He was awarded the

National Business Aviation

Association's Silk Scarf

Award, given to individuals

for special contributions

"There's a myth in aviation that we're paid as pilots and mechanics to get the mission done. I would say we're actually paid to say no."

to the business aviation community, for his efforts.

Of all the work he has done to improve flight safety, however, Jeff cites the past 15 years on the Eastern Region Helicopter Council (ERHC) as his most rewarding in aviation. The group is made up mostly of flight department managers and chief pilots from the New York City metro area who rely on the council for guidance on political and legislative issues.

During his time with ERHC, Jeff served as chairman for

Jeff, chief pilot at R.O.P. Aviation, prepares for another five years as well as director and VP of operations. "We developed the New York City Air SOP, which standardized air tour routes flying out of downtown Manhattan, to address community noise concerns."

The council also maintains a robust Fly Neighborly program that brings communities together to work out aviation issues. "I'm most proud of my leadership on the council," Jeff says. "I became the subject-matter expert for helicopters in the Northeast." For his service, Smith earned the council's Chairman's Award for Excellence.

In promoting aviation, Smith isn't afraid to

fight for an airport's very existence. In 2014, he organized stakeholders to block a community effort to stifle operations at Long Island's East Hampton Airport (KHTO). The town imposed crippling flight restrictions that would have shut down airport business. Aircraft considered "too noisy" were prohibited from flying from 8 pm to 9 am. "This included almost all the helicopters," Jeff recalls.

Jeff's group fought the restrictions in federal court and won an initial victory. However, the airport has since privatized and closed amid additional ongoing litigation.

With all his experience as an aviation

advocate, Jeff is no stranger to HAI, for which he has served in various capacities for more than 10 years. He credits the association for giving him the tools to build his business and professional career and says his involvement in HAI's working groups has honed his management and leadership skills.

"Members can draw on the HAI staff's broad range of expertise whenever needed," Jeff adds. He urges anyone in the vertical lift industry to become a member and take advantage of that knowledge, as well as the association's many networking and educational opportunities, to advance their professional development.

Prior to becoming board chair, Jeff served as HAI's vice chair and treasurer. In the latter position, which he held from 2020 to 2021, he was responsible for a \$14 million investment portfolio. In addition, he chaired the Fly Neighborly and Environmental Acoustics Committees (now the combined Fly Neighborly / Environmental Working Group) for four years, working with operators, equipment manufacturers, engineers, and government agencies such as the FAA, Department of Transportation, and NASA to reduce the noise impact of aircraft and improve community relations.

"Noise mitigation and the need to maintain community compatibility is one of the most important issues facing the aviation industry," Jeff says. He has also worked closely with HAI's Helicopter Tour Operators and Flight Operations Working Groups and the latter's Vertical Flight Infrastructure Sub-Working Group.



As chair, Jeff has three important priorities: expanding HAI's international footprint to unify the helicopter community globally—"We need to emphasize the 'I' in HAI"—enhancing the association's role as the leading global voice, and promoting and advocating for the vertical lift industry. (See "Vertical Flight Industry Struggles to Fill Vacancies," on p. 30, for more on Jeff's third priority.)

This year, the HAI board appointed a special advisor - international as another step in broadening the association's global reach, an initiative Jeff aims to expand on.

"My vision is to expand our regional





partnerships, like those we have with the European Helicopter Association and the Australian Helicopter Industry Association," both of which participate in HAI's International Partnership

Another concern confronting the industry is the integration of eVTOL (electric vertical takeoff and landing) aircraft. "Vertical lift technology is rapidly changing. Electric vehicles will have sophisticated avionics, engineering for low noise and low emissions, and advanced batteries," Jeff notes. "And they'll operate in the same spaces as legacy aircraft." The HAI board has appointed a special advisor - emerging technology to help the industry embrace these new vehicles, he adds.

As the incoming chair evaluates the current helicopter community, he considers safety to remain an issue. Poor flight planning followed by scud running is a recipe for disaster and far too often leads to unintended flight in IMC (UIMC), loss of control in-flight (LOC-I), or striking an object at low altitude (LALT). Unsurprisingly, the US Helicopter Safety Team ranks UIMC, LOC-I, and LALT among the top three causes of fatal helicopter accidents during the past

decade. Jeff argues that too many accidents under these circumstances can be traced to a pilot's refusal to say no.

"We've come a long way in changing the safety culture," Jeff says. "But we still have a way to go. We need to go beyond 'Land & LIVE.' There's a myth in aviation that we're paid as pilots and mechanics to get the mission done. I would say we're actually paid to say no."

Other times, hazardous situations may be caused by inexperienced pilots flying unfamiliar or overequipped aircraft. "More training needs to be done for these pilots," Jeff adds, such as providing more initial training and annual refresher courses to ensure that pilots use systems properly and spend less time distracted during critical phases of flight.

#### A VVIP Passenger

Jeff has more than 11,500 hours of flight time involving everything from air ambulance operations to flying in a movie production and enough stories to generate hours of great hanger talk. But one memory really stands out—the time Jeff and his copilot were assigned to fly to Kennebunkport,

An avionics suite like this one (above) reduces a pilot's workload, provided every function is understood, Jeff says. His top priority (left), even after 11,500 flying hours, remains safety, and nothing is routinenot even performing a preflight.

Maine, to pick up former president George H. W. Bush and fly him to a library dedication in Brookline, Massachusetts.

Before they could begin the trip in their TwinStar (AS355 F2), Jeff and his copilot were both required to have a top secret security clearance. The space over the Bush compound, located on Walker's Point in Kennebunkport, is prohibited airspace, just like above the White House.

The crew finally launched, and as they neared the former president's property, they contacted Boston Center Air Traffic Control for clearance to land. "We don't give those kinds of clearances," was the response. "Still, I felt good about the mission, so we proceeded," Jeff recalls.

As they flew over the former president's estate, the crew noticed several buildings. "We didn't know which one was the president's residence," Jeff says. "Then I saw a huge Texas flag next to one building. Being from Texas myself, I knew that had to be it."

Spotting a grassy area near the flagpole, the crew landed, still unsure if the president was nearby.

"We saw a guy in overalls and a baseball cap walking toward us. 'That must be one of the gardeners. He should be able to tell us if we landed in the right spot.' But as the somewhat untidy guy got closer, a pet terrier ran by. "And sure as hell, it's George H. W. Bush!" exclaims Jeff.

But wait, there's another surprise. "After a few seconds, some Secret Service Suburbans [SUVs] approached us and came to a screeching halt. We found out we landed at the wrong spot.

"The former president was one of the most wonderful passengers we ever had," Jeff continues. "He spoke about fishing, the kind of fish he caught, the history of the nearby islands. He was just a gentleman. When we brought him back [from the library dedication], he changed out of his suit and took off in his boat to go fishing even before we departed."

HAI President and CEO Jim Viola praises Jeff for his contributions to both HAI and the helicopter community. "Jeff is one of those rare aviation trailblazers who will surely take the helicopter industry to the next level," Viola says. "We look forward to his leadership."

Jeff says none of his successes could have been achieved without family support, especially from his wonderful wife, Lauren. "There were many family functions I had to miss, and Lauren carried the load."

Oh, and Jeff did eventually get that college degree, in 1995. He holds a bachelor of science in business aeronautics from Embry-Riddle Aeronautical University. 🕞



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# Finding the Future in Dallas

The VTOL industry rebounds from the pandemic with new sales, product launches, and lessons learned.

By Jen Boyer



HELI-EXPO 2022 WELCOMED THE vertical flight industry to Dallas, Texas, this year to "Find the Future." The theme of the event, which ran from Mar. 7 to Mar. 10 at the Kay Bailey Hutchison Convention Center Dallas, proved prophetic as more than 13,000 attendees from 72 countries walked the show floor, attended classes, participated in meetings, and met face-to-face again.

Attendance exceeded expectations, even with the worldwide travel restrictions that kept many veteran Expo attendees away.

This year's 590 exhibitors were 90% of the number on the show floor at HAI HELI-EXPO 2020 in Anaheim, California, and the number of attendees was 91% of 2020's total. The energy on the show floor was high as industry veterans and newcomers alike reconnected.

"It really felt like people took this year's theme to heart,"

says HAI President and CEO James Viola. "Everybody I talked to was extremely happy with how the show was going. A lot of people turned out ready to do business.

"It is clear many companies scheduled their strategy around HAI HELI-EXPO this year. Our show definitely drives completions of projects, and that is evident by all the news announced this year," Viola continues.

Indeed, hundreds of helicopter, engine, product, and service agreements, sales, and commitments were announced alongside updates and product launches. Most every announcement touted increased sales and business in 2021 over 2020.

### **OEM Numbers Tell a Good Story**

Some industry sectors are already above their 2019 numbers, with heavyweights Sikorsky, MD Helicopters, and Leonardo reporting their highest single-year sales in many years. Airbus Helicopters cited a more than 40% recovery of the overall



helicopter market since 2020, while the company's North American branch reported booking totals for 2021 that exceeded those for each of the previous five years.

In general, medium- and light-duty helicopters are selling more

briskly than heavy aircraft, according to Airbus. But with many manufacturers eyeing a recovering oil-and-gas market as fuel prices climb, several OEMs hinted that business for large aircraft is expected to grow in this sector if gas prices remain at or above current levels.

Some other sectors of the industry are

still catching up, such as large helicopter tour companies that rely on international customers. Not until international tourism returns to pre-pandemic levels is helicopter tourism on the whole expected to fully recover, according to a representative of Papillon Grand Canyon Helicopters, the world's largest helicopter tour company.

Scrappy manufacturer Schweizer is progressing on its FAA validation

process to manufacture its aircraft, says Schweizer President David Horton. With an FAA Part 145 certification expected in the second quarter of 2022, the company will soon be able to add full component repair and overhaul to its capabilities. FAA sign-off for full manufac-

> turing is expected at the same time, allowing Schweizer's new-aircraft production to pick up.

> MD Helicopters Chairman Alan Carr says his company has experienced stronger aftermarket support and growing sales in the two years since its former CEO stepped down. Since the show, MD

Helicopters had announced a buyer, a creditor consortium led by Bardin Hill and MBIA Insurance. The sale was still pending court approval as of press time.

Another beloved industry veteran, Enstrom Helicopter Corp., had apparently received new ownership during the show. On Mar. 8, MidTex Aviation signed a purchase agreement to acquire all of Enstrom's assets,

## "It really felt like people took this year's theme to heart."

- James Viola, HAI President and CEO

breathing new life into the brand after Chapter 7 bankruptcy shut the company's doors earlier this year. But the deal later fell through when MidTex encountered problems obtaining funding.

Enstrom instead was purchased by Chuck Surack, founder of musical instrument retailer Sweetwater Sound and Surack Enterprises, in May. Surack's aim is to rebuild the Enstrom brand into one of the leading American-made helicopter manufacturers.

### **Pandemic Lessons for Better Business**

At the heart of the industry's recovery, however, is the work that took place during the pandemic. Our industry is one forged from exceptional, outside-the-box engineering and business solutions. As the world changed suddenly, rotorcraft businesses went back to these basics, and many came out stronger and better prepared to support their customers as a result.

The onset of the pandemic and the subsequent business

rebound was visible at the show. This year's exhibitors amounted to 90% of those who participated in HAI HELI-EXPO 2020 in Anaheim, California, while the number of attendees was 91% of 2020's total.

The industry's



slowdown created an opportunity for vertical flight organizations to devise leaner processes and procedures as well as invest in more-efficient technology. Robinson Helicopter Co., facing increased labor and supplier shortages, invested in technology that both streamlined company processes and required less labor.

"By switching to more CNC [computer numerical control] machines, we were able to automate more processes," says Robinson President Kurt Robinson. "The CNC water jets, for example, have made a substantial difference."

When the pandemic hit, Rolls-Royce was already experiencing a massive turbine-wheel backlog brought on by a perfect storm of issues involving tooling, the supply chain, management issues, and outdated equipment. After the business team began working from home in March 2020, the entire company went through a major reorganization that streamlined the reporting process and increased project accountability, which led to significant efficiency increases.

"There is no perfect organizational strategy; each has different strengths and weaknesses," says Scott Cunningham, helicopter program director for Rolls-Royce Corp. "However, in our former organization, no one specifically owned an issue. Now, it's an integrated program where there is project ownership."

The new organizational structure removed roadblocks, allowing the company to invest significantly in the latest manufacturing technology to produce turbine wheels and manage the supply chain. Rolls-Royce built up and now maintains a buffer of supply in case the supply chain breaks down again. By the beginning of 2022, the company had resolved all engine holds waiting on wheels, was reporting 97% uptime, and now enjoys the lowest number of back orders in the past five to six years, Cunningham says.

Safran Helicopter Engines CEO Franck Saudo saw the pandemic as a chance to "adapt at the speed of flight" to head off supply chain issues. He says the company switched gears during the downturn by streamlining and reorganizing within the company.

"Supply chain is more an art than a science," Saudo says. "I was convinced it was important to adapt fast. One way was to cut costs. We chose to organize ourselves differently to address a changing market. Rather than ask our people to do more with less, we looked at how to reorganize. This led to more than 30 internal adaptations.

"Second was operational planning," Saudo continues. "We were paranoid about keeping our supply chain an accurate compass of what we expect in demand. The earlier we could give that compass to our suppliers, the better we would be serviced. Third, we erased and redid our ERP [enterprise resource planning] management."

In some ways, Saudo reflects, the pandemic was an



Optimism was high at HAI HELI-EXPO 2022, with several manufacturers reporting sales close to or beyond pre-pandemic levels.

opportunity. "We learned a hell of a lot. Working as a team, with the people who are next to the market, you can do a tremendous amount of work for your customers."

Pratt & Whitney Canada shared in a statement that it focused on sustainability and advanced its development of hybrid-electric propulsion technology with funding from the governments of Quebec and Canada.

### **Finding the Digital Connection**

As VP of business development for commercial and international military at Sikorsky, a Lockheed Martin company, Eric Schreiber felt pretty confident sales and operations in 2020 and 2021 would remain fairly steady. His real concern was the lack of customer connection during the pandemic and how that would affect business in 2022 and beyond.

What developed surprised him. "As quickly as we adapted to Zoom and other mediums of communications, our customers did too," Schreiber says. "Our employees developed connections in new ways. Zoom calls can happen in the middle of the night when it works for the customers. We're finding our customer relationships are stronger than they were before."

Sikorsky also reevaluated its investments during the pandemic to maximize returns, Schreiber adds. When sales slowed, the company reallocated funds to support higher demand for aircraft such as the Firehawk to meet the world's growing need for wildfire suppression tools. Sikorsky was able to expand the Firehawk's customer base to Eastern Europe and the Asia-Pacific while also making advancements such as ADS-B Out qualification.

Airbus Helicopters took a similar tack. As sales slowed in 2020, the company turned its attention to research, development, and innovation, particularly in sustainability and digital services. The company launched its HDataPower digital connectivity suite in 2021, one of the results of this focus.

For Leonardo, the ability to pivot quickly helped maintain the company's momentum, says Roberto Garavaglia, SVP of strategy and innovation at Leonardo. Located in Italy, a



country that suffered severe impacts in the first wave of the pandemic, Leonardo quickly set up a remote work structure for employees.

"We learned that smart work was not so bad," Garavaglia says of employees working remotely. "We found that people could manage more work when given flexibility, which worked out really well for them and the company. Some members of our team are still smart working. We learned to be more flexible in how we manage ourselves without a loss in productivity."

At Bell, a key lesson that stands out to Lane Evans, Bell's managing director of North America sales, was embracing the value of digital media. Bell launched a completely digital experience for customers to see the Bell 505, a first for the company. The three-hour online event allowed customers to learn about the aircraft, ask questions, and get answers in real time.

"This really showed us how powerful and successful digital media is at reaching our customers," Evans says. "Not being able to connect face-to-face with customers pushed us into learning new ways to connect, through videos, virtual meetings, and social media. What we also found was customers

rotorcraft were on display at HAI HELI-EXPO 2022 (below) With Ukrainian Helicopters unable to attend due to the war in their homeland, many well-wishers wrote notes of support to post in the company's empty booth (right).

More than 40



were craving that interaction too. Before the pandemic, they may have been too busy with other things. Now, they had the time to have that interaction."

Bell focused on developing relationships with customers, influencers, media, and photographers that now help boost business today and into the future, Evans says. "It's a whole new way of interacting, and I think it's changed business for the better."

### United for Ukraine

In addition to the industry recovery and business building, the other undeniable big issue affecting HAI HELI-EXPO 2022 was Russia's invasion of Ukraine. Only 12 days old on the day the show floor opened, the war's effects were felt throughout the event.

HAI member Ukrainian Helicopters had planned to exhibit in Dallas but ultimately couldn't attend. The company's booth remained in place, however, decorated with a banner of the Ukrainian flag and a display of sunflowers, the national flower. Attendees stopped by and wrote messages of support to the Ukrainian people, posting them to the banner.

The industry displayed a united show of support for sanctions against Russia for the unprovoked invasion of Ukraine. All major rotorcraft manufacturers confirmed at the show they had stopped selling parts, engines, components, and aircraft to Russia. Those companies with employees or businesses in Russia confirmed they had closed up shop in the country and evacuated non-Russian employees.

Overall, OEMs with aircraft in Russia reported that the helicopters, all civilian, represent a very small percentage of their collective fleets. The exception: Robinson.

"The killer for us is the Russian civilian commercial- and private-owner market has been slowly growing over the years," says Kurt Robinson. "It's under 10% of our business, but it's still a big hit.

"We have aircraft on the line for Russian buyers; we're setting those aside," Robinson adds. "We're also working out how to arrange the line around ships on deposit that haven't started being built. With bank accounts frozen, money isn't coming in either. We won't build them now until we have a clearer picture of how things will play out."

Leonardo is involved in HeliVert, a joint venture with Russian Helicopters that serves as a final assembly plant for the AW139 and a maintenance facility for AW109, AW139, and AW189 helicopters in Russia. The company safely evacuated all non-Russian employees in the early stages of the Russian troop buildup in Ukraine and has since ceased all interactions with Russian Helicopters, according to Leonardo. Leonardo has also stopped sending parts, aircraft, and support to Russian customers.

For Sikorsky, the situation hit home with the company's



wholly owned subsidiary PZL Mielec in Poland, which manufactures the S-70i and several airplane models. Employees there have been actively involved in providing humanitarian

assistance to refugees. Sikorsky is also providing funds to support these humanitarian efforts, including stipends to Polish employees who take in Ukrainian refugees.

Bruno Even, CEO of Airbus Helicopters, reported that about 260 Airbus aircraft operate in Russia and that the company had ceased all shipments and support. "We expect the impact of the war should be limited in the short term. However, midterm, it's too soon to comment on how that will affect the company."

Bell was more straightforward about the economic impact of the Russian invasion. At the beginning of its Expo press conference, Bell shared parent company Textron's statement expressing solidarity and compliance with sanctions as well as the closure of its operation in Russia. On how that could affect the company and the industry as a whole, Bell shared what other manufacturers kept close to the chest.

"There are Bell helicopters in Russia, all civilian," says Lane Evans. "In the short term, these actions will affect us mainly in Europe. However, there potentially could be opportunities to increase military sales down the road in neighboring countries. It's all still fluid right now. Time will tell." 😯





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Sustainable aviation fuel (SAF) produced from renewable and waste feedstock can provide the greatest impact in the effort to reduce GHG emissions from aircraft, potentially slashing them by up to 100%, according to the FAA. But is it really possible to turn used cooking oil and other waste into a safe, affordable "drop-in" SAF (a renewable fuel that can be substituted for fossil fuel without the need for engine modifications)? The short answer is yes.

In 2021, HAI joined the Business Aviation Coalition for Sustainable

Aviation Fuel (BACSAF) in advocating for reducing emissions and transitioning to SAF. The group comprises the Canadian Business Aviation Association (CBAA), European Business Aviation Association (EBAA), General Aviation Manufacturers Association (GAMA), International Business Aviation Council (IBAC), National Air Transportation Association (NATA), and National Business Aviation Association (NBAA). It's supported by the Commercial Aviation Alternative Fuels Initiative (CAAFI), whose membership consists of airlines, aircraft and engine manufacturers, energy producers, researchers, and US government agencies.

These industry stakeholders are keen to ensure that SAF reduces emissions across the fuel's entire life cycle—from creation to harvesting, processing, refining, and transport—not just at the nozzle. Otherwise, what's the point, they say.

### A Big Push

Aviation represents 11% of the United States' transportation-related greenhouse gas emissions, according to a Sep. 9, 2021, White House briefing. Of course, those numbers are rising as more and more people and cargo fly.

Since last year, HAI has joined the BACSAF's steering committee, backed several legislative and White House proposals designed to make SAF more readily available and affordable for the business aviation community, and organized and hosted webinars on the alternative fuel. In HAI's Sep. 30, 2021, webinar, "Sustainable Aviation Fuel: The OEM Perspective," experts from Airbus Helicopters, Bell, and Safran discussed the advantages of SAF and answered operators' questions about it.

"It is our collective responsibility to contribute to zero emissions, and SAF is a major contributor to reaching that goal," said Bruno Even, CEO of Airbus Helicopters, during the webinar. "As of today, 40% of net CO<sub>2</sub> emissions could be avoided by using SAF blends."

It's clear that industry organizations as well as aircraft and powerplant manufacturers want operators to get comfortable with and start using sustainable aviation fuel.

In September 2021, the Biden administration boosted the aviation industry's efforts to develop sustainable aviation fuels when it announced the Sustainable Aviation Fuel Grand Challenge.

The effort outlines a goal to produce at least 3 billion gal. of SAF per year by 2030. Currently, providers produce just 4.5 million gal. The Sustainable Aviation Fuel Grand Challenge also sets a goal of producing enough sustainable aviation fuel to meet 100% of aviation fuel demand—expected to be 35 billion gal. per year—by 2050, according to the Sep. 8, 2021, Sustainable Aviation Fuel Grand Challenge Memorandum of Understanding.

### It's All Jet Fuel

At its core, sustainable aviation fuel is a blend of conventional Jet A/A-1 fuel and a highly processed feedstock, typically cooking oils and grease, plant oils, municipal trash, wood waste from mills, sugarcane and sugar beets, seaweeds and algae, and agricultural waste, among others. The mixture ends up as kerosene jet fuel. A fast-track approval process helps SAFs that are blended at 10% feedstock with the same types of molecules as exist in petroleum-based jet fuel get to market more quickly, according to the US Department of Energy's September 2020 report Sustainable Aviation Fuel: Review of Technical Pathways.

"There are seven approved pathways that have been authorized so far," explains Keith Sawyer, manager of alternative fuels for Avfuel, a global supplier of aviation fuel and services based in Ann Arbor, Michigan. "Each one is blended at a different percentage between 10% and 50%."

All sustainable Jet A/A-1 fuels have undergone rigorous testing and certification. When blended with petroleum, they are a fully fungible, drop-in fuel, meaning they seamlessly fit into existing aviation infrastructure without issue; airports don't need to store SAFs separately, and fixed-wing and rotorcraft operators can add them to their tanks as they would conventional Jet A/A-1 fuel, commingling at will.

"SAF is jet fuel. It meets the technical and certification requirements for use in turbine-powered aircraft engines," says Pete Bunce, GAMA's president and CEO. (For an update on efforts to clean up avgas for piston-powered aircraft, see "Fixing the Avgas Lead Problem," p. 44.)

"Civil aviation authorities and aviation industry stakeholders, including aircraft OEMs and engine manufacturers, have put in place an exhaustive and thorough process to approve SAF.

"This drop-in fuel is compatible for use without any needed

WATCH The 1st Rescue Helicopter to Fly on SAF

SAF is a blend of conventional jet fuel and highly processed raw materials such as cooking oil, grease. and other waste products.



# Fixing the Avgas Lead Problem

EAGLE initiative tackles toxicity of avgas.

For decades, experts have been trying to rid avgas of its lead. Added to boost octane and prevent engine damage at high power settings, tetraethyl lead, as the fuel additive is known, is quite toxic, even at very low levels.

Almost all avgas in the US market today is grade 100LL (100 octane low lead), and more

than 190,000 registered piston-engine aircraft use the fuel to operate,

> according to the FAA. With leaded gasoline for cars banned since 1996, avgas is now the largest source of lead emissions in the United States.

Creating an unleaded fuel that will deliver the same performance advantage as 100LL has thus far eluded researchers. With concern growing over

lead's toxicity, however, the aviation industry has decided to step up its efforts to find a solution.

In February 2022, the FAA announced a new public-private initiative to eliminate lead in avgas by the end of 2030 without compromising safety and while maintaining the viability of the existing piston-engine fleet and infrastructure. Backed by leading aviation organizations, including HAI, the Eliminate Aviation Gasoline Lead Emissions (EAGLE) initiative brings together stakeholders from aviation, the petroleum industry, and US government agencies to solve the complex issue of developing, testing, and certifying an unleaded fuel that is effective and safe to use, not only in piston engines but throughout the aviation fuel supply chain.

"About 25% of the rotorcraft fleet is made up of piston aircraft, which are often used as trainers and by tour operators," says Cade Clark, VP of government affairs for HAI, who serves on the EAGLE policy committee. "Removing lead from avgas is going to require a lot of work from industry and government, as well as refiners and operators. We have to ensure we put procedures in place for a safe transition. There's going to be a gradual phaseout: 100LL isn't going to magically

disappear overnight."

Today, only one fuel being produced, UL94, meets ASTM International specifications for unleaded avgas, according to Options for Reducing Lead Emissions from Piston-Engine Aircraft, a 2021 report by the National Academies of Sciences, Engineering, and Medicine (available online at hai.rotor.org/cfOUry). An option for some low-performance fixed-wing aircraft and rotorcraft, UL94 is only available at a limited number of airports, likely due to the high cost of the separate storage and dispensing system required.

"[UL94] has the potential to be used in about half to two-thirds of existing piston-engine aircraft," notes the report. "Aircraft would need to acquire FAA certification approvals to use UL94, which many newly produced aircraft do not have. However, many low-performance models are technically capable of using this fuel, and continued innovations in engine design could soon enable many future high-performance aircraft to use it as well."

Experts from the National Academies suggest that the FAA issue a Special Airworthiness Information Bulletin to permit the use of UL94 in aircraft that can use it safely today, as well as provide incentives for airports that would make the fuel more widely available.

Of course, UL94 solves only part of the problem: creating a universal, drop-in, lead-free fuel replacement for all piston-engine aircraft remains the ultimate goal for the industry and the EAGLE initiative. Researchers need all the help they can get.

"Removing the lead is the right thing to do. We encourage others to join the EAGLE initiative, especially on the technical side," Clark says. "We want to make sure we're preserving operators' right to fly by having fuel available, but we need to do our part to remove lead from that fuel. Taking a proactive stance by finding a solution is a better approach—and one way to protect the future of our industry."

modifications, recertification, or additional validation," Bunce continues. "Fixed-wing and helicopter OEMs have flown their aircraft on SAF and have demonstrated that it's safe to use."

### No Modifications Needed

Sustainable Jet A/A-1 fuel is already being used by aircraft operators. According to the Air Transport Action Group, more than 400,000 commercial flights around the world have used SAF since 2011. Bell Textron uses sustainable aviation fuel in its fleet of some 20 training and customer demonstration aircraft in Fort Worth, Texas.

"We partnered with Avfuel to establish a steady supply of the alternative fuel source to our facilities and became its first rotorcraft customer to use SAF," said Michael Thacker. EVP of innovation and commercial business at Bell during last year's HAI webinar. "Safety is always a top priority for Bell. We continue to reiterate that this fuel requires no modification to the aircraft or any additional pre- and postflight procedures.

"Having a cleaner environment for our future is a shared industry goal and demands participation from all OEMs, customers, and innovators," he added.

In addition to Bell, Avfuel serves OEM customers Bombardier, Embraer, and Textron Aviation and supplies sustainable Jet A/A-1 fuel to several airports and fixed-base operators in California and Colorado that cater to business aviation aircraft.

GE Aviation has been leading efforts to standardize SAF and move toward even higher blend ratios. The company is



quick to reassure operators that all GE Aviation engines, as well as those supplied by CFM International, a joint GE Aviation-Safran Aircraft Engines company, require no recertification to burn industry-approved sustainable aviation fuel.

Several aircraft in the Airbus fleet, including the H145,

H175, and H225, have recently completed flight tests with SAF, Even told participants in the HAI webinar. He said that other airframes are soon to follow, "as our entire range is certified to fly with a blend of as much as 50% SAF."

Jean-Baptiste Jarin, Safran's deputy program manager, research and technologies, acknowledged during the webinar, "Today, test sales [of our engines] at our OEM sites are running with up to a 35% blend ... and the blend ratio will increase to 50% by 2025."

A Neste researcher (above) studies feedstock for use in the company's sustainable fuels. The Finland-based corporation produces and delivers sustainable aviation fuel (refinery at left) around the world.



### The Price Hurdle

Certainly, SAF's higher price presents a hurdle, but there's hope. SAF is a blend, after all, tied to the cost of crude oil. If a typical blend is 30/70, then 70% of the price comes from conventional jet fuel and 30% from the feedstock, which is relatively more price stable. As the percentage of feedstock increases—and during times when the price of oil is high—the numbers should begin to work in operators' favor.

More important, tax credits as well as economies of scale driven by increasing demand should bring down the cost. Right now, state incentives on the West Coast are helping reduce the price in California, with Oregon and Washington soon to follow, according to Sawyer.

"In California, SAF is around 2 times the price of a refined jet gallon on a delivered basis. Outside of California, you're looking at perhaps 2.3 to 2.5 times the price," says Sawyer. "With various state and federal incentives on the way, the price should come down. Possibly even airports may do things to reduce the price, such as eliminate a landing fee or a fueling fee when using SAF."

The Biden administration's economic agenda includes a SAF tax credit designed to cut costs and increase domestic

production. It also provides funding opportunities for SAF projects and fuel producers as well as support to farmers who grow feedstocks.

"There's a large coalescing of initiatives now to help the industry get to the next level. Even major refiners in the United States are examining a variety of renewables," says Sawyer.

"It's generating strong momentum to increase production, which ultimately will yield more supply and more consumption," he continues. "We look forward to working with more and more rotorcraft operators as they seek to integrate SAF into their supply. We can work with them individually or they can work through our network of fixed-base operators to secure the supply they need."

With sustainable aviation fuel, the aviation industry can move closer to energy independence, greater economic prosperity, and a future that's a little easier on this planet we call home.

As Stefan Thomé, EVP of engineering and chief technical officer at Airbus Helicopters, asked of participants during HAI'S OEM SAF webinar, "Let's create the demand and then the supply will follow, not the other way around." •

# **Housing Is Now Open for HAI HELI-EXPO 2023**





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only elevated public heliport in the Dallas-Fort Worth area of Texas, sporting more than 3 acres of concrete, two spacious helipads, and parking for five aircraft. In many ways, the vertiport shows the future of advanced air mobility (AAM).

Adjacent to a ground-level commuter rail and bus station, the vertiport is located on a major road through downtown Dallas and has direct access to the Kay Bailey Hutchison Convention Center Dallas, one of the largest convention centers in the United States and host to more than 1 million visitors each year. This setting aligns with the vision of incorporating AAM as a central element in a transportation hub, moving people and cargo quickly in and out of densely populated city centers.

Dallas Vertiport doesn't offer hangarage or refueling (though the latter might soon be addressed) but is a convenient drop-off and pickup spot for those who wish to fly rather than drive to and from the city. It's also handy for local law enforcement, air ambulance, and news-gathering aircraft.





### **How AAM Looks Now**

A reported 150-plus airframers—many of them start-ups—are developing at least as many AAM vehicles, many of them powered by electric motors. In tandem with developing a new class of aircraft comes the task of building the infrastructure to support AAM operations.

How will that future look? On the air side, probably not markedly different from how it looks today. Whether going by the term "heliport" or "vertiport," these facilities will feature acres of paint-striped concrete abutted by hangars, terminals, and lots of people coming and going.

Above: One Airbus AS350 sits on the ramp at Dallas CBD Vertiport (49T) as another departs, while a Bell 505 approaches to land. Synchronizing ground operations while deconflicting arrivals and departures is just one of the challenges to be faced as rotorcraft operations—piloted, remotely piloted, and autonomous—are expected to significantly increase in coming years.

Right: A Bell 206, parked along the vertiport's southwestern edge, gazes out at traffic passing by on Interstate 35E. Its ability to evade ground-traffic congestion is one of the reasons AAM is predicted to have a bright future.







### Beauty on the Inside

The terminal—the waypoint for passengers between their rideshare and the airstair—can be as modest or as luxurious as the traffic will allow. At the recently updated Dallas Vertiport (above), the floor is a stylish, polished stone-like surface, the furniture is comfier than what your typical airport offers, and the distance from the elevator to the ramp is only about 40 ft.

But that cozy size won't suffice if the predicted tempo of AAM operations comes to pass. The expected floods of passengers will require security equipment, including space for those waiting to be screened and for screened passengers waiting to board their flight.

Above: The vertiport's recently renovated terminal building is cozy and comfortable and provides convenient access to the aircraft as well as offices and meeting rooms for flight crews and operators.

Left: Though the City of Dallas brands the facility a vertiport, the exterior signage on the terminal building uses a more common term.



### The Future's Unknown

While regulatory agencies and their stakeholders trudge ahead with planning a future airspace teeming with automated taxis and flying cars, little is known concretely about the futuristic facilities that will host those flight operations. An FAA advisory circular published in 1991 was canceled in 2010 when the anticipated arrival of commercial tiltrotor traffic proved illusory.

A new advisory circular is in the works, but, as the FAA notes in a draft of Engineering Brief No. 105, Vertiport Design, "The emerging VTOL aircraft and industry advanced air mobility concepts of operation are yet to be proven to perform like [helicopters with single, tandem, or dual rotors]. Additionally, because VTOL aircraft and the AAM industry are rapidly evolving, there is limited demonstrated performance data on how these aircraft operate." In other words, the FAA isn't able to prescribe, or even advise on, how AAM-specific heliports should look, because it isn't yet known how AAM vehicles will perform.



Above: HAI HELI-EXPO 2022 attendees walk out to a waiting EC225 LP, soon to whisk them away on an Airbus demonstration flight. The vertiport's ability to host flights like these makes Dallas an attractive location for HAI's annual show.

Right: Although ideation for what became Dallas CBD Vertiport began in 1982, final approval to construct the facility came in late 1991, with completion barely two years later.

# Center Heliport

## CITY OF DALLAS

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1994





Above: Arrivals and departures are actually cleared through air traffic control at Dallas Love Field (KDAL), 5 miles to the north-northwest, in whose controlled airspace the vertiport operates.

At least there's attention, if not progress. Rex Alexander, president of AAM consultancy Five-Alpha, observes, "With many in our industry looking to existing heliports to augment AAM flight operations, heliports will be provided something they have rarely ever received in the past: attention and scrutiny."

Most future heliports will look and work the same as they do now because the business will still be about utility, durability, efficiency, and safety. And as Alexander points out, successful heliports will share these attributes with Dallas CBD Vertiport: "convenient access to ground transportation; proximity to an urban hub; a large, unencumbered ground footprint ripe for expansion; clear, open airspace for flight operations; and the support of the city in which they operate." ?

# Not the Only Heliport in Town

Dallas CBD Vertiport might be the only elevated public heliport in the Dallas-Fort Worth area, but there are two other public heliports, each barely 10 miles—as the AAM flies—from the vertiport. What these two may lack in altitude, though, they make up for in other ways.

Garland/DFW Heloplex (T57), northeast of the vertiport, was opened in 1989 as the first municipal heliport in Texas. Originally intended to shuttle passengers to and from Dallas Fort Worth International Airport (KDFW) and Dallas Love Field (KDAL), the heliport faced closure a mere two years later, when the market for the service hadn't materialized.

It avoided that early demise and, in 1999, the City of Garland signed a long-term lease with SKY Helicopters, the current operator of the facility. Not only does the company provide fuel, hangarage, and maintenance, it is also a dealer for Robinson Helicopter Co. and provides both Part 141 and Part 61 training. SKY also offers your standard fare of flying services, such as tours, aerial surveys, and aerial photography/videography, and provides aircraft and crews for electronic news-gathering in the DFW area.

DeSoto Heliport (73T), south of the vertiport, opened in 2014 and is now operated by SKY Helicopters. The range of services isn't as broad as at Garland, encompassing fuel, hangars, and maintenance, but the heliport is the base for a number of PHI aircraft and training personnel. It also has room to grow as the demand arises, including, in preparation for future vehicles, plenty of electric power on tap.



### **FLIGHT PATH**

# QUICK FACTS Michele Viviani

Kopter Group AG, Wetzikon, Switzerland

### **CURRENT JOB**

I hold an EASA maintenance license and am currently employed as an experimental technician on Leonardo's Kopter AW09 project. My job is to keep the helicopter airworthy by carrying out scheduled maintenance and correcting any defects that are found.

### **FIRST AVIATION JOB**

My first aviation job was at a flight school where I was hired as a maintenance assistant/ helper. I worked on the R22, R44, and Cessna 172.

### **FAVORITE HELICOPTER**

For its characteristics, its longevity, and its ability to operate in many sectors, my favorite helicopter is the H125, although the most beautiful shape of all remains that of the AW109





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

My grandfather was an airplane designer for [Italian aircraft manufacturer] Caproni; a friend of my mom was a former military pilot; and my [first] name was also the name of a dear family friend who did the same job as I do. Let's say helicopters were my destiny! I've always been fascinated by this vehicle!

### What are your career goals?

I've attained a good position in my career. I can boast of having worked in all sectors of the helicopter world, and I'm happy about the diversity of training that experience has afforded me. That said, I'd like to become a maintenance manager or a project manager. I'd also like to become an instructor.

Now, I'm a helicopter mechanic with an EASA AML [aircraft maintenance license] for Categories B1.3 (helicopter turbine engine) and B1.4 (helicopter piston engine). Soon, I'll also become licensed for B1.2 (airplane piston engine) and B2 (avionics). And I'm taking

lessons to obtain my PPL(H) [private pilot license for helicopters].

Additionally, I run my own company, Heliair.it, part time in Italy. We offer tourist flights, helitaxis, and aerial work. I also keep an Instagram page, @helitechnician, where I display my maintenance work and some of the helicopters I've worked on.

# What advice would you give someone pursuing your career path?

My advice is to ask someone in the aviation industry to help you choose the best path based on their experience. Often, I've found, the road to training can be unnecessarily complicated. Talking with a professional in the industry, someone who's been down the path already, can help you determine the right approach to take.

# Tell us about your first experience with helicopters.

I was 5 years old when I saw a company promoting tourist helicopter flights. I remember

my dad sat me in the front seat next to the pilot. I was silent for 5 minutes, overwhelmed by the sensations I was experiencing.

### What still excites you about helicopter aviation?

This work is a passion. I like to see people express interest in helicopters and maybe ask for some information about them. One thing I love to do is ask kids if they want to take a picture on board.

The work of an aeronautical technician carries great responsibility. Everything must be perfect, every procedure applied, and every tool in its place at the end of the job.

I make them go up, put the headset on, and turn on the master. Their smiles make the effort this occupation requires pay off.

The work of an aeronautical technician carries great responsibility. Everything must be perfect, every procedure applied, and

every tool in its place at the end of the job. It entails a mental as well as a practical approach.

Knowing that a helicopter is flying because of my work can evoke in me the feeling I had as a child when I would look up at the sky hoping to see a helicopter go by.

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

Certainly the energy debate, fuel consumption, and the approval of [alternative] fuels.

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

... talking to people, I see they're fascinated by my work and my stories.

### Complete this sentence: I love my job, but I'd rather work for a paper company in Scranton when ...

... I feel my skills aren't appreciated and I'm not heard; that could warrant going to work for a paper company. Aviation is hard work, and satisfaction can often be hard to come by. •



# RECENT ACCIDENTS E INCIDENTS

HE ROTORCRAFT ACCIDENTS AND INCIDENTS LISTED BELOW OCCURRED FROM FEB. 1, 2022, TO APR. 30, 2022. The accident details shown are preliminary information, subject to change, and may contain errors. All information was obtained through the official National Transportation Safety Board (NTSB) website, at bit.ly/2lueqZa, unless otherwise noted. There, you can learn more details about each event.

### February 2022

### **Hughes 369HS**

Panama City, Panama Feb. 7, 2022 | NTSB GAA22WA099 0 injuries, 0 fatalities | Flight type unknown No description available.

### Hiller UH-12E4

Shrewsbury, PA, USA
Feb. 9, 2022 | NTSB ERA22LA118
0 injuries, 0 fatalities | Personal flight
No description available.

### **Hughes 369D**

Bel Air, MD, USA Feb. 9, 2022 | NTSB ERA22LA117 0 injuries, 0 fatalities | Positioning flight

The pilot performed emergency descent after engine chip light illuminated followed by a grinding noise and smoke in the cockpit. Shortly before landing, the engine failed, resulting in airframe and rotor damage during touchdown.

### **Bell 206**

Eldorado, IL, USA Feb. 11, 2022 | NTSB CEN22LA122 1 injury, 0 fatalities | Air-taxi flight No description available.

### **Garlick UH-1H**

Devonport, Australia Feb. 14, 2022 | NTSB GAA22WA103 Injuries unknown, fatalities unknown | Flight type unknown

No description available.

### **Bell UH-1H**

Coalinga, CA, USA Feb. 16, 2022 | NTSB WPR22FA098 0 injuries, 1 fatality | Agricultural flight

During transit after completion of an aerial application flight, helicopter impacted terrain for unknown reasons and was destroyed.

### **Robinson R44 II**

White Plains, NY, USA
Feb. 17, 2022 | NTSB ERA22LA135
O injuries, O fatalities | Positioning flight
No description available.

### **MD 500N**

Newport Beach, CA, USA Feb. 19, 2022 | NTSB WPR22FA101 1 injury, 1 fatality | Law enforcement flight

Pilot entered a right orbit to support police activity below. The pilot then reported experiencing an uncontrollable right yaw and descent before impacting water, destroying the aircraft. The pilot egressed but one crew member suffered fatal injuries.

### **Robinson R44**

Miami Beach, FL, USA
Feb. 19, 2022 | NTSB ERA22LA131
3 injuries, 0 fatalities | Personal flight
Helicopter was transiting along the shoreline
when the pilot reported losing power and

when the pilot reported losing power and performed an autorotative descent to shallow water.

### Sikorsky S-61N

Kekaha, HI, USA Feb. 22, 2022 | NTSB ANC22FA018 0 injuries, 4 fatalities | External-load flight Helicopter impacted terrain for unknown reasons and was destroyed during a post-crash fire.

### **Robinson R22**

Bilinga, Australia Feb. 26, 2022 | NTSB GAA22WA110 0 injuries, 0 fatalities | Flight type unknown No description available.

### **Robinson R44**

South Goulburn Island Airport, Australia Feb. 28, 2022 | NTSB GAA22WA111 0 injuries, 0 fatalities | Flight type unknown No description available.

### March 2022

### **Robinson R22**

Fallston, MD, USA
Mar. 1, 2022 | NTSB ERA22LA140
1 injury, 0 fatalities | Instructional flight
No description available.

### Sikorsky S-92A

Plymouth, England Mar. 4, 2022 | NTSB GAA22WA117 0 injuries, 0 fatalities | Air ambulance flight No description available.

# **Eurocopter Deutschland GmbH** MBB/BK 117 C-2

Abingdon, VA, USA Mar. 6, 2022 | NTSB ERA22LA145 1 injury, 0 fatalities | Public aircraft

During an attempted landing to a platform dolly, the pilot lost control of the aircraft and landed hard on the adjacent ramp, resulting in significant damage to the airframe and rotors.

### Sikorsky S-76D

Texarkana, AR, USA
Mar. 12, 2022 | NTSB ANC22FA018
0 injuries, 0 fatalities | Air taxi flight
No description available.

### **Eurocopter AS350 BA**

Valdez, AK, USA Mar. 15, 2022 | NTSB ANC22LA023 1 injury, 0 fatalities | Air taxi flight No description available.

### **Hughes 500D**

De Soto, IA, USA Mar. 17, 2022 | NTSB CEN22LA146 1 injury, 0 fatalities | External-load flight

Helicopter sustained partial power loss and the pilot entered an autorotation. The aircraft impacted terrain before coming to rest on its right side.

### **MD Helicopters MD 369**

Loxahatchee, FL, USA
Mar. 18, 2022 | NTSB ERA22FA160
0 injuries, 2 fatalities | Personal flight
Helicopter was destroyed after impacting power lines at 80 ft.

### **Eurocopter AS 332L1**

Azusa, CA, USA

Mar. 19, 2022 | NTSB WPR22LA125

6 injuries, 0 fatalities | Law enforcement flight

During attempted landing to an unimproved area, the flight crew encountered brownout conditions and the main rotor struck a tree before the helicopter settled to the ground and rolled onto its left side.

### **Robinson R44 II**

Howe, ID, USA Mar. 22, 2022 | NTSB WPR22LA132 3 injuries, 0 fatalities | Personal flight No description available.

### American Autogyro SparrowHawk III

Lubbock, TX, USA Mar. 23, 2022 | NTSB CEN22LA150 0 injuries, 0 fatalities | Personal flight No description available.

### **Robinson R44**

Rowlett, TX, USA
Mar. 25, 2022 | NTSB CEN22FA151
0 injuries, 2 fatalities | Instructional flight
Tail boom separated from the helicopter due to
suspected rotor blade impact, resulting in a loss of
control and near vertical descent before terrain

### **Robinson R22 Beta**

impact.

Garnett, KS, USA Mar. 26, 2022 | NTSB CEN22LA158 0 injuries, 0 fatalities | Personal flight No description available.

### **April 2022**

### **Bell OH-58A**

Merced, CA, USA Apr. 1, 2022 | NTSB WPR22LA140 1 injury, 0 fatalities | Agricultural flight No description available.

### **Hughes 269A**

Fort White, FL, USA
Apr. 2, 2022 | NTSB ERA22LA180
2 injuries, 0 fatalities | Personal flight
No description available.

### Leonardo AW139

lwaizumi, Japan Apr. 3, 2022 | NTSB GAA22WA153 Injuries unknown, fatalities unknown | Flight type unknown

No description available.

### **Bell 206**

Adaminaby, Australia Apr. 4, 2022 | NTSB GAA22WA154 Injuries unknown, fatalities unknown | Flight type unknown

No description available.

### **Robinson R22**

Seymour, TX, USA Apr. 5, 2022 | NTSB CEN22LA167 0 injuries, 0 fatalities | Personal flight No description available.

### **Robinson R22**

Phoenix, AZ, USA Apr. 6, 2022 | NTSB WPR22LA146 0 injuries, 0 fatalities | Instructional flight No description available.

### **Robinson R44 II**

Calhoun, GA, USA Apr. 12, 2022 | NTSB ERA22LA188 1 injury, 0 fatalities | Personal flight No description available.

### **Robinson R22 Beta**

Gila Bend, AZ, USA
Apr. 15, 2022 | NTSB ANC22FA030
0 injuries, 1 fatality | Instructional flight
During solo student pilot's approach, helicopter
entered into uncontrolled descent and impacted
terrain short of the runway.

### **Eurocopter AS350 B3**

Deer Valley, AZ, USA
Apr. 16, 2022 | NTSB WPR22LA154
2 injuries, 0 fatalities | Flight type unknown
No description available.

### **Robinson R44 II**

Salt Lake City, UT, USA
Apr. 16, 2022 | NTSB WPR22LA157
2 injuries, 0 fatalities | Instructional flight
No description available.

### **Bell 206B**

Cedar Key, FL, USA Apr. 18, 2022 | NTSB ERA22LA192 0 injuries, 0 fatalities | Agricultural flight No description available.

### **Bell 206**

Lake Apopka, FL, USA Apr. 26, 2022 | NTSB ERA22LA206 1 injury, 0 fatalities | Agricultural flight No description available.

### Bell 429 Elba, NY, USA

Apr. 26, 2022 | NTSB ERA22FA207 O injuries, 2 fatalities | Instructional flight Tail boom separated from helicopter due to suspected rotor-blade impact, resulting in loss of control and terrain impact.

### Garlick OH-58A+

Oakland, FL, USA Apr. 26, 2022 | NTSB ERA22LA209 0 injuries, 0 fatalities | Agricultural flight No description available.

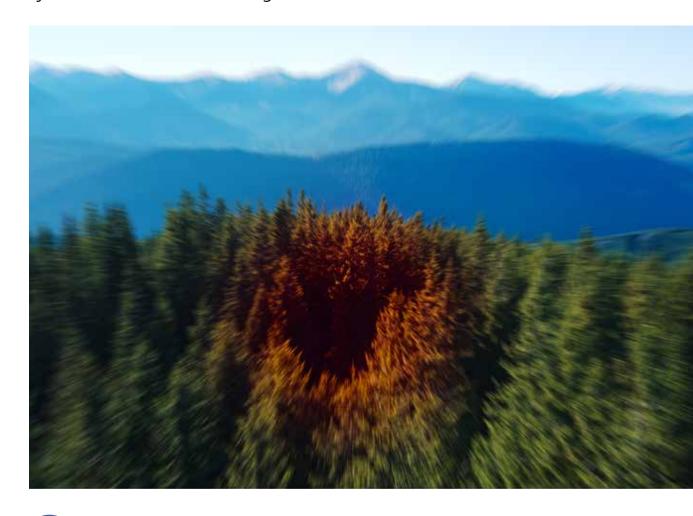
### **Robinson R44 II**

Folsom, NM, USA Apr. 28, 2022 | NTSB WPR22LA168 0 injuries, 0 fatalities | Agricultural flight No description available.

# HAI/MARK BENNETT IMAGE FROM ISTOCK/BILANOL PHOTO

# **Past the Limits**

Pilot inexperience, absence of crash-resistant fuel system lead to heartbreaking outcome.



S

OME FLIGHT PROFILES ARE EASIER TO EXECUTE THAN OTHERS, but the simplest can still present unexpected challenges—especially in rarely drilled emergencies or situations that tempt pilots to exceed their own or their organization's limits.

### The Flight

On Aug. 31, 2019, a charter operator at Alta in northern Norway offered quick sightseeing flights to guests at the annual Høstsprell music festival, a service the company had provided since 2012. The weather was fine, with light winds and a few scattered clouds.

Two company pilots made the seven-minute flight from Alta Airport (ENAT) to the festival area at Kvenvikmoen in LN-OFU, an AS350 B3. One pilot operated the helicopter while the other served as

loadmaster. They landed at 16:12 local time and shut down the engine to board the initial group of passengers. The loadmaster seated them, secured their safety restraints, and provided them with headsets.

The first flight took off at 16:40 with five passengers on board. ADS-B returns and flight tracking data from the operator's GPS monitoring system showed that the helicopter initially flew northeast toward Alta, then made a wide right turn toward the Skoddevarre mountain while returning to the festival site. One passenger estimated

their lowest altitude en route was 50 m (165 ft.) and said the flight felt safe "without drama or discomfort." They landed at 16:50 and the pilot again shut down the engine.

Five more passengers boarded, taking off at 16:59 on what was planned to be a slightly shorter flight along a similar route. At 17:02, one back-seat passenger sent a friend a photograph on social media. In it, no sky is visi-

ble ahead of the aircraft. Instead, the instrument panel indicates the helicopter was pitched down 30 degrees and rolling 10 degrees left at an indicated airspeed of 90 kt.

About five minutes after takeoff, someone approached the loadmaster to report hearing a loud bang, then pointed out flames and a column of thick black smoke on the hillside above Kvenvik. Hearing no helicopter noise, the loadmaster contacted the company's air traffic center, then the police, the Joint Rescue Coordination Centre (JRCC) for northern Norway, and air traffic control at Alta Airport. A Cospas-Sarsat satellite began relaving

signals to the JRCC from the helicopter's emergency locator transmitter (ELT) at 17:06, and traffic center staff realized that the helicopter's position tracking had ended at 17:08. Search-and-rescue efforts began at once.

At 17:16, a Bell 205 operated by Heli-Team AS en route from Banak to Kvænangen spotted the accident scene and landed, finding the AS350 almost completely consumed by fire. Only the passenger in the right front seat had managed to escape. He was flown to the University Hospital of North Norway, where he died of his injuries the following day.

### The Aircraft

LN-OFU was essentially a brand-new helicopter, having flown just 72 hours since its airworthiness review certificate was granted on Jun. 12, 2019. Its first 100-hour inspection had been performed ahead of schedule on the day of the accident and found no anomalies beyond a slight oil leak from the gasket around the main gearbox input shaft.

After the inspection, the aircraft flew only the combined 22 minutes of the ferry and two sightseeing flights. It was not fitted with either of the two crash-resistant fuel systems available as optional equipment.

To prevent overloading the main rotor system, the AS350's hydraulic system limits the force produced by its flight-control servo actuators to a maximum of 193 kg (425 lb.). "Servo transparency" occurs when greater force is required to control main rotor blade pitch due to some combination of speed, weight, g-loading, density altitude, and collective pitch. The helicopter is apt to roll



right and pitch up while the flight controls seem to have locked. While the AS350 flight manual describes this condition as "self-correcting," it can cause significant altitude and attitude excursions unless the pilot can compensate with muscle power or promptly reduce the loading.

The accident aircraft. an Airbus Helicopters AS350 B3, registered as LN-OFU.

### The Pilot

The 27-year-old pilot held a Swedish commercial certificate and an unrestricted first-class medical certificate. He'd obtained his AS350 type rating at Airbus Helicopters' facility in Marignane, France, in May 2018, scoring 96% correct on the knowledge test and passing all elements of the flight assessment.

He subsequently completed company operator proficiency checks in August 2018 and February, April, and August 2019 as well as an April 2019 flight test with a Norwegian government examiner. Only the 2018 type-rating course included a practical demonstration of servo transparency. His 256 hours of career flight time included 17 in the AS350 and 50 total hours conducting passenger flights. Company colleagues described him as "meticulous, structured, calm, and cautious."



The accident helicopter's remains. pictured during an NSIA examination in a hangar near Oslo, Norway, Sep. 12, 2019.

### The Investigation

The Norwegian Safety Investigation Authority (NSIA) report on the accident notes that the extent of aircraft damage made the investigation "challenging." Except for the tail boom, the airframe was almost completely consumed by fire, and no data could be retrieved from any of the onboard electronic recording or monitoring devices or the mobile telephones found in the wreckage, which was confined to a small area on an east-facing slope just below the peak of Skoddevarre at an elevation of 301 m (988 ft.).

Two exhaustive searches eventually recovered almost all components that survived the fire. Detailed examination showed that the main and tail rotors were turning at the moment of impact and found no evidence of any in-flight failure. The distribution of the wreckage strongly suggested that the helicopter struck the ground in a shallow nose-low attitude with slight left roll at relatively low speeds, both horizontal and vertical.

ADS-B and GPS tracking data showed that while the ferry flight was straight and level, both sightseeing flights included "great variations in altitudes and speeds" suggestive of vigorous maneuvering over similar points in the landscape, with climbs and descents in excess of 3,000 ft. per minute (fpm). The final position fix showed the helicopter less than 300 ft. above the mountaintop, descending at 3,072 fpm as airspeed increased from 125 to 135 kt. The aircraft was also close to maximum gross weight.

Based in part on the precedent of 11 prior accidents cited in its report, the NSIA concluded that LN-OFU entered servo transparency at low altitude and struck the ground before its pilot could complete the recovery, and that the relatively low energy of the collision strongly suggested that without the fire, the accident would have been survivable.

### The Aftermath

Airbus Helicopters made crash-resistant fuel systems standard equipment on all new AS350 helicopters delivered after Oct. 1, 2019, and on Oct. 10 of that year issued a letter urging operators to retrofit the systems to all AS350, H125, and EC130 models. No airworthiness directive to that effect has yet been issued in either the United States or Europe, however.

On Oct. 17, 2019, Coptersafety opened a Level D AS350 flight simulator facility in Vantaa, Finland. Simulator sessions in the United States at American Eurocopter in Grand Prairie, Texas, following a 2011 Norwegian accident reproduced servo transparency to an extent described by the participating instructor as "FRIGHTENINGLY realistic! We entered an uncontrolled roll, banking further to the right. The controls 'froze' at the same time as the collective wanted to come down." After reproducing the 2011 accident sequence, which began at 300 ft. agl, he wrote, "We were of course

aware of what would happen, but if you're not, you have to be very lucky to avoid crashing into the ground!" He concluded that "simulator training would be incredibly beneficial to our pilots." LN-OFU's pilot never had that opportunity.

### The Takeaway

LN-OFU's operator regarded sightseeing flights as "the most basic operation there is" and a good way for inexperienced pilots to build time. As gauged by the technical skills required, that's likely true: they're generally conducted in benign weather, and the company's operations manual required them to be "as smooth as possible," restricting flight attitudes to no more than 30 degrees of bank and pitch attitudes within 15 degrees of level. The investigation made clear that, at least on that particular day, the pilot ignored the latter constraint.

The NSIA noted that the pilot's company training hadn't included passenger flights supervised by a more experienced pilot, and that both the accident pilot and his passengers were relatively young. Research suggests this fact may have fostered a group dynamic that encouraged greater risk-taking—and flight-tracking data corroborated an earlier passenger account that the pilot had promised to fly low to provide a sense of speed.

A healthy regard for his own inexperience demonstrated by scrupulous adherence to minimum safe altitudes and maneuvering limits would likely have prevented the accident, while effective fire prevention almost surely would have mitigated its consequences, the NSIA concluded.

Studies of airline pilots consistently find that they perform very well in emergency situations they practice frequently but much less so in unfamiliar situations. This is hardly a surprise. And while most helicopter pilots like to fly low, altitude equals time when things start happening quickly. When the urgent question becomes "What's it doing now?" time to sort it out can be the most valuable commodity on earth."



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# The 'M' Word

Assuming a "mission" mentality in HAA operations doesn't equate to recklessness. It promotes safety.

UCH HAS BEEN MADE IN PILOT TALK and recent writing about what seems to be the new dirty word in the helicopter air ambulance (HAA) industry: "mission." Some safety commentators tell us that a "mission mentality" can lead to dangerous attitudes in the cockpit. Even using the word "mission" to characterize an operation marks the speaker as a risk-taker.

Several senior pilots in my company have said that former military pilots, especially, make the mistake of considering what HAA crews do a "mission" when what

we execute is merely a "flight request." We operate "medical taxis," another pilot has told me.

Well, for those of you who prefer the BLUF (bottom line up front), I offer that our safety record in HAA, and in public-service aviation in general, would be better if we embraced *more* of a mission mentality, not less.

### What's Within Our Control

Various statistics show that human error is the primary or a contributing factor in 60% to 80% of helicopter accidents. Among the long list of FAA-identified human



errors that can be attributed specifically to the flight crew (as opposed to organizational failures) are:

- Failing to properly plan a flight path
- Failing to adequately maintain the helicopter
- Failing to operate the aircraft properly
- Operating the helicopter in unsafe conditions
- Failing to operate the aircraft in accordance with its operational limitations.

A May 2021 FAA study, "Medical Helicopter Accident Review: Causes and Contributing Factors," organizes these factors under the broad brushstroke of "planning and training deficiencies." Training is a topic for another discussion, but planning is something we can directly address as a flight crew.

First, let's take emotion out of the word "mission." The definition of the word isn't just running out to the helicopter with our hair on fire but, according to

Merriam-Webster, simply "a specific task with which a person or group is charged." This is exactly what we do in HAA, and while we have little say over issues prior to the sound of "the tones" or the dispatcher's phone call, the next step is completely within our control.

Our safety record in HAA, and in public-service aviation in general, of a mission mentality, not less.

would be better if we embraced more

Adapting Military Planning to Civilian **Operations** 

eventually worked for me was the military mnemonic "METT-TC," which stands for the following six factors of planning and execution:

Let the eye-rolling commence when I say that what

- Mission
- Enemy
- Troops
- Terrain (and weather)
- Time (and time available)
- Civilian considerations.

METT-TC is used primarily by the US Army as "a framework to aid ... in analyzing a situation, prioritizing key aspects, and then planning accordingly to achieve success." That approach sounded reasonable to me, and I easily adapted it to my newfound air ambulance career.

> METT-TC facilitates an organized process that makes the complex clearer and fits with another axiom: if one is well prepared, planning is minimal. Whole

weeks are devoted in professional military education to understanding and utilizing METT-TC, but without getting too far in the weeds, I'll condense it for HAA purposes.

### Mission

The mission usually includes a mission statement and commander's intent for an operation. My HAA director of operations doesn't want to hear from me for every call, so I boil down this "M" into making sure I have a good command of our GOM (general operations manual), MEL (minimum equipment list), checklists and procedures, and of course, 14 CFR Parts 91 and 135: the basic knowledge my boss expects me to have as a professional aviator before turning the blades on company aircraft.

I found that once I had a comprehensive understanding of this step, I was better able to make informed decisions as an HAA pilot.

### Enemy

I haven't heard of anyone being shot down in HAA, but we still face an enemy. And it's one of the most dangerous. As the Walt Kelly cartoon character Pogo famously said, "We have met the enemy and he is us."

Remember, a large percentage of helicopter

That's exactly the step I struggled with as a new HAA pilot. I felt my specific aircraft training was comprehensive and my instructors outstanding, yet there was very little discussion of mission planning for HAA, even though most of us are familiar with the axiom "planning mitigates risk."

What was apparent was that our company hired very experienced pilots who already knew how to plan a mission. But HAA missions differ from what most of us military helicopter pilots have experienced. Most military helicopter pilots fly in a dual-pilot cockpit and have never flown single-pilot. Nor have they been the sole decision maker in planning and operations as they find themselves in HAA. They are also inexperienced in providing their own weather briefings and terrain analysis. And civil HAA lacks the homogeneity and background in training that military crews are accustomed to, which can muddy the judgment and crew resource management acumen of former military pilots. These are huge cultural shifts.

In deciding what would work for me in HAA given my military experience, I determined HAA flight planning had to have a framework, be continuous, and be flexible enough to encompass both scene and interfacility flights as well as VFR, IFR, and NVG (night-vision goggles).

accidents can be attributed to human error. If we view ourselves as the "enemy" and understand that our planning and actions may be the primary cause of our demise or success, we can more adequately address some of the personal and professional challenges we face as aircrew members—and avoid the civilian version of fratricide

### **Troops**

Most of us in HAA still wear a uniform, and as pilots, we are responsible for the safe conduct of the flight, including the actions of our flight crews.

In essence, our crew is our troop. And as a crew, we must be a well-coordinated, communicative, and participatory team, as our crew resource management training encourages.

I'm a huge proponent of incorporating the IMSAFE (illness, medication, stress, alcohol, fatigue, emotion) model into every flight-shift briefing and encouraging crew members to honestly and objectively do the same throughout their time on duty. Our success depends on our well-being, truly having our "head in the game," and integrating the individual into the team concept.

### Terrain (and Weather)

Among other positions I held in my 33-year military career was that of an aviation mission survivability officer (AMSO). As AMSOs, we held the maxim that every weapon system had a PH (probability of hit) versus a PK (probability of kill), but that terrain and weather most always had a PH and PK of 100% each.

IIMC (inadvertent entry into instrument meteorological conditions) and CFIT (controlled flight into terrain) have always been, and continue to be, nemeses of aviation and HAA in particular. We have a plethora of tools at our disposal to combat these threats, and most of us understand that knowledge and continuous monitoring of the topography of our area and changing weather conditions make for a safer flight.

The US National Weather Service Helicopter Emergency Medical Services Tool is a great resource, but it's only a tool and must be combined with a deeper understanding of current observations and specific forecast products to be effective.

Map study, planned HOE (highest obstacles en route) between known facilities, use of electronic flight bag resources, a detailed IIMC plan, and forward-looking terrain- and obstacle-avoidance systems can complete our detailed threat-avoidance / threat-mitigation tool kit. These, with many other available inputs, constitute our intelligence.

### Time (and Time Available)

Performance expert Michael Altshuler wrote, "The bad news is time flies. The good news is you're the pilot." That couldn't be truer in our industry. Time is of the essence in what we do, but not taking the time to plan, decide, and act in a safe and legal manner is consistently our undoing.

And that's where lies the central part of the argument to embrace the mission concept. If we allow ourselves the time and effort to plan before the tones ever sound, and have a template for our plan and actions, we increase the chances of making a good decision and conducting a safe flight—or declining a mission request when prudent. It's up to us.

### Civilian Considerations

Instead of noncombatants on the battlefield, the word "civilians" now refers to the professionals, volunteers, and facilities both integral and peripheral to our decision-making and flights as nonmilitary, HAA professionals.

Assessing the emergency services available in our geographic area, their capabilities and limitations, and the level of training we can lend them facilitates a better, safer integration of people and assets in HAA operations. Similarly, maintaining a knowledgeable flight operations or dispatch department and an extensively researched and documented record that details facility information adds more to our planning and execution tool kit.

All of this serves to better prepare and support HAA crews in the variety of situations and locations in which we may find ourselves operating. And all these topics can be addressed before we ever put on a flight suit.

### **Preparation over Planning**

The logistics of the Lewis and Clark Expedition have long stuck with me: preparation is more important to the effort than specific planning. So it is with HAA: continual attention to and improvement of our mission preparations are critical to planning when time is fleeting.

That said, there will never be a one-size-fits-all process for, or method of, conducting a flight safely, and mine surely isn't the only way that can get us to the lofty goal of zero accidents. But a process and a method are necessary in reaching for that goal.

By applying a structured approach to planning, staying informed of critical flight issues, and incorporating a template to determine our actions, we significantly increase our opportunities for success—and survival.

As Benjamin Franklin cautioned, "If you fail to plan, you are planning to fail." •

# Do You Know Where Your Tools Are?

Even one misplaced item can pose a serious hazard.

HEN DO YOU REALIZE YOU DON'T HAVE all your tools accounted for? Is it on the drive home, when you have that gut feeling that something's not right? Is it when the pilot or next mechanic finds it on a preflight or daily inspection? Let's hope it's not during an accident investigation.

Routine tool and hardware accountability is one safe practice that seems like a no-brainer, but sometimes we become distracted and leave tools or other hardware on an aircraft.

### Strict Accountability for Each Tool

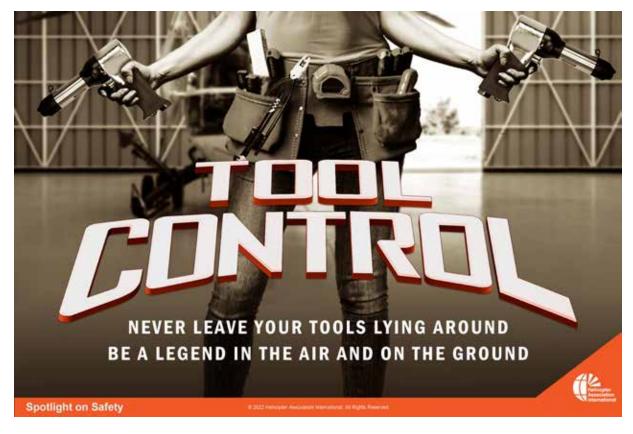
Aviation has come a long way in tool control over my years in the industry. In the early 1980s, I was a member of a helicopter squadron that implemented a program of tool control that mandated that the entire squadron would be grounded if even one tool wasn't accounted for. Every tool used on an aircraft was signed out of the

tool room. Before that aircraft was released for flight, every tool signed out had to be logged back in. We all thought these measures were extreme.

Sometimes we'd receive a phone call in the late-night hours that required a drive back to the hangar to return the socket or small tool that we'd forgotten about in our pocket and didn't notice as we checked in our other tools. Over time, however, we learned the value of this best practice and the consequences of poor tool accountability.

As has been said before, most, if not all, aviation regulations or rules are written in blood. Poor tool control has been attributed to many aviation accidents over the decades.

There's a well-known story of Charles Lindbergh's Spirit of St. Louis airplane having a pair of pliers in the airframe that seemingly was left during the building of the aircraft at Ryan Airlines or possibly used by



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

Lindbergh himself on his famous flight from New York to Paris in 1927. The pliers were found when the aircraft was being prepared for display at the Smithsonian Institution.

### Don't Forget Hardware and Debris

Tool control should also encompass other relevant items the aviation mechanic or engineer is working with, such as hardware. I once had smoke in the cockpit of an aircraft just after takeoff. Upon landing back at the airport from which I departed, I began a search for what caused the smoke. After about six hours of searching over two days, I found a very small nut that had fallen from someplace unknown to me and lodged itself between two poles on the master switch, causing the circuit to short and burn some wires coming from the electrical master circuit.

I looked for a long time, hoping to see where the nut came from, but every instrument had corresponding hardware, and nothing was missing. My suspicion is that at some point over the aircraft's long history, a technician lost the nut during a panel upgrade, couldn't find it, and replaced it with another nut, leaving the original for me to find on my fateful fight.

Unfortunately, this wasn't an isolated occurrence. Parts bags have been filled with pieces of safety wire, nuts, screws, bolts, washers, and cotter pins that were left behind after being abandoned during past maintenance.

This author isn't above reproach. Just last week, I was removing the battery from an aircraft for a local airplane owner. After the battery removal, we engaged in typical hangar chat. After leaving the owner's hangar and checking my toolbox, I realized I had left a quarter-inch drive ratchet and half-inch socket on the wing of his Cessna 310. Perfect tool control, like so many aspects of safety, is a goal to be pursued every day, and every day you start anew.

Having a place for every tool, using

foam shadowing to clearly indicate what's missing, and asking for a second set of eyes to verify it's a clean and complete job with all tools accounted for will save you from worry and embarrassment—and from being part of an accident investigation.

Please contact HAI for information on helpful safety programs and literature such as our new tool control safety poster (p. 69) and our soon-to-be-added HAI Maintenance Safety Management System (SMS) program. The program, originally designed for Part 145 repair stations but now adaptable to line maintenance as well, is just one of many safety resources we continue to add to our lineup to support HAI members' needs.

HAI operator members interested in participating in the HAI Maintenance SMS program can contact me at

zac.noble@rotor.org.

Fugere tutum! ?



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