

# ROTOR

JUNE 2023

THE MAGAZINE OF HELICOPTER ASSOCIATION INTERNATIONAL



## Nicole Battjes

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## ROTOR

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**PUBLISHER**

**James A. Viola**

**EDITOR**

**Gina Kvitkovich**

**DEPUTY EDITOR**

**Christine A. DeJoy**

**CONTRIBUTING EDITOR**

**Jayne Wood**

**GRAPHIC DESIGN**

**Phyllis J. Utter**

**ADVERTISING**

**sales@rotor.org**  
**352-388-7031**

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**ON THE COVER:** Andy Stenz of The Image Group photographed Nicole Battjes, CEO and founder of Hawaiian air tour operator Rainbow Helicopters, in Kaneohe Bay, Oahu, a setting that showcases the island's abundant natural beauty. After the photo shoot, Nicole, who will become the chair of Helicopter Association International on Jul. 1, 2023, flew her company's Airbus AS350 B2 off the barge and back to its mission of delighting passengers. Read more about Nicole, her journey to Hawaii, and her plans for the coming year in her profile on p. 26.

### WRITE FOR ROTOR

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# CONTRIBUTORS

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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 Boyer

Jen Boyer is the principal of 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 in the aviation industry since the early 1990s.



## 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 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. She holds a bachelor's degree in English and is currently pursuing her master's in marketing.



## Aaron Karp

Aaron Karp has been an aviation journalist for more than 20 years. He has served as editor in chief of *Aviation Daily* and managing editor of *Air Cargo World* and is currently a contributing editor to the Aviation Week Network.



## 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.



## 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.



## James T. McKenna

An award-winning journalist, James T. McKenna has covered airlines, military aviation, spaceflight, and helicopters for *Aviation Week*. Twice editor in

chief of *Rotor & Wing*, he's written for the Flight Safety Foundation, *The New York Times*, *USA Today*, *Vertical*, and *Vertiflite*. He specializes in covering accident investigations and safety.



## Zac Noble

Zac Noble, HAI director of flight operations and maintenance, has more than 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 multi-engine airplanes. Zac is a dual-rated ATP, a dual-rated CFII, and an A&P mechanic with IA privileges.



## David Repsher

David Repsher, a proud member of HAI's Safety Working Group, was critically burned in an air ambulance post-crash fire in July 2015 while working as a certified

flight nurse and a nationally registered paramedic. After a lengthy and still ongoing recovery, he can be frequently seen at helicopter safety events advocating for occupant protection and safety awareness.



## 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, where he was interim president in 2018 and lead government affairs representative from 2017 until he left the organization. Previously, as a legislative staffer, John advised multiple members of Congress on transportation policy.



## Jol A. Silversmith

Jol A. Silversmith is an attorney with KMA Zuckert in Washington, D.C. His practice principally involves advising airlines, other

aviation-related businesses, trade associations, and governmental entities on issues such as government regulation, international bilateral relations, airport issues, litigation, antitrust, intellectual property, and government affairs.



## Dan Sweet

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

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



## Katia Veraza

Katia Veraza is HAI's manager of government affairs and regional relations. Before joining HAI, she was a managing consultant for

government affairs. She earned her master's degree in political science from the Autonomous University of Barcelona.



## Jayne Wood

Jayne Wood joined HAI as assistant director of publications and media in November 2022, returning to the part of

communications she loves—writing, editing, and publishing—after more than a decade as communications director for a nonprofit association. Before that, she was a communications consultant serving both associations and corporations.



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By Jeff Smith

## What I Learned as HAI Chair

*The people of this great organization are a perfect fit to help our industry prosper.*



Jeff Smith is the chief pilot for R.O.P. Aviation in Teterboro, New Jersey, and the 2022–23 chair of the HAI Board of Directors. A former US Army aviator, he is a dual-rated pilot with more than 11,500 flight hours. Jeff is an active industry volunteer and advocate who has worked on noise, safety, and airspace issues in the New York City area as a member of the Eastern Region Helicopter Council.



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**W**HAT A YEAR! In my last column for ROTOR as chair of the HAI Board of Directors, I want to enthusiastically thank everyone who has been part of my journey. It has been a remarkable experience.

When I took over as chair in July 2022, my vision and direction were clear: to help HAI become a truly international organization that could assist in the integration of emerging technology as part of our ongoing mission to expand, diversify, and strengthen the worldwide vertical aviation industry.

I jumped right in, traveling in June 2022 to Europe for a transcontinental road show, attending helicopter air shows, meeting with OEMs, and seeing some fantastic integration of safety management systems by Airbus and Safran. I also met the leaders of the European Helicopter Association (EHA), including Chairman Christian Müller; Vice Chairman Thierry Couderc, who is also the executive officer of Union Française de l'Hélicoptère; David Stubbs, chairman of The British Helicopter Association; and of course, EHA Executive Director Isabella Abbate.

Isabella, who masterminds the EUROPEAN ROTORS trade show, brought in HAI to produce the 2022 edition. Charlotte Zilke, HAI's senior director of membership and conventions, and her staff performed their usual, remarkable job of making the show a huge success. What a great effort by this international team—I look forward to this year's show in Madrid.

During my time as HAI chair, I traveled half the world with James Viola, HAI's president and CEO, who is completely dedicated to the members of this organization. James not only shows leadership when he is traveling and meeting members—he also uses that leadership to empower the staff at HAI.

The dedication, loyalty, and pride demonstrated by the HAI staff is extraordinary, and the organization runs like a Swiss watch. With a staff of 35, these folks hold three events for the industry and attend 20 more. Their work to educate and inform, advocate on behalf of the industry, and elevate safety advances and protects all our members. In the past 18 months, the staff have launched 13 new member benefits. Please visit [rotor.org/benefits](https://rotor.org/benefits) to see how HAI is helping you.

Even though I have attended many HAI HELI-EXPO® trade shows, being at our 2023 event in Atlanta as the board chair was both enlightening and exhausting. Thanks to the efforts of Charlotte and her team and the entire HAI staff, everyone I spoke with was extremely impressed and happy with their experience at the show.

I made a point to eat at the staff lounge every day—it was great to hang out and talk with them. My in-house therapist was Gina Kvitkovich, our director of publications and media. Gina and I talked about everything, including what soup to have. Besides being an expert on soup, Gina is responsible for getting HAI's message out and does so brilliantly. Thanks, Gina, for the shove and push.

Thanks also to Chris Martino, senior director of operations and international affairs, who, when I showed up at the staff lounge dressed in jeans and an HAI polo for what I thought would be a casual day, reminded me that we were sitting down to lunch with industry leaders (my idea, by the way)—in about 30 minutes! Certain disaster was averted by teamwork.

The flawless execution of the annual HAI HELI-EXPO fly-in and fly-out is something the US Department of Defense could learn from. I have great memories of watching HAI staff

members, including Chris Martino; Chris Hill, senior director of safety; Zac Noble, director of flight operations and maintenance; Dan Sweet, director of public relations and communications; Cade Clark, VP of government affairs; John Shea, director of government affairs; Jaasmin Foote, social media manager; Ashten Brown, operations manager; and the rest of the staff act as a highly synchronized team, guiding 40-plus aircraft efficiently and safely to and from the show floor.

I especially want to thank Mike Hertzendorf, COO and VP of member services, for being there all the time, always at the right time, with the right message. Though he is intimidating to talk to at first, Mike is a baller of a leader, and HAI is lucky to have him.

Lastly, I really want to give a shout-out and huge thank-you to the HAI Government Affairs Department, including Cade Clark, John Shea, Manager of Government Affairs and Regional Relations Katia Veraza, and Policy Analyst Emma Taylor (now attending law school)—you guys are my immediate family at HAI.

Flying in the New York City metropolitan area, I have developed a specialty: explaining how our industry works to those who think it doesn't. Cade and his team

were my allies as we tackled every piece of legislation that touched vertical aviation, positive or negative, from every level of government. We built bridges inside and outside our industry. Along the way, we had to have the tough talks about Pepsi versus Coke and what kind of "brown water" we would be having.

The future is so bright for HAI. The incoming chair of the Board of Directors, Nicole Battjes, has more energy than anybody I have witnessed—juggling leadership and a demanding business and making it look easy. With her creative mind and business savvy, Nicole, in concert with James Viola, Mike Hertzendorf, and the rest of the HAI staff, will reposition our association—and the global vertical aviation industry—for sustainable growth and success.

As I give up the reins as chair, as well as my seat on the HAI Board of Directors, I want to tell you all it was a good ride. Be safe and prosperous—and see you next year in Anaheim! 🇺🇸



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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, James holds ATP ratings in both airplanes and helicopters and is a CFII. James can be contacted at [president@rotor.org](mailto:president@rotor.org).

## Be an Industry Ambassador

*Community engagement is about telling our story ... and listening, too.*

**T**HE VERTICAL AVIATION INDUSTRY IS FACING a wave of threats from external actors who do not understand the value of the services our industry provides. Take a look at what has been reported in this and previous issues of ROTOR:

- A story in the December 2022 ROTOR described how the US National Park Service (NPS) is issuing air tour management plans (ATMPs) that will eliminate air tours over some NPS lands while others will be drastically reduced.
- On [p. 13](#) of this issue, you can read about efforts to close the Indianapolis, Indiana, Downtown Heliport, even though that facility supports crucial public services for the city, including law enforcement and air medical access.
- Also on [p. 13](#), the HAI Government Affairs team explains why two state bills in Hawaii—both specifically aimed at giving individuals in that state the legal standing to sue owners and operators over the sound created by their helicopters—were defeated on technical grounds. Are you seeing a pattern here?


HAI recognizes that our industry needs to do a better job of telling our story, because it is a great one. As our incoming chair, Nicole Battjes, says on [p. 31](#), our industry is not just a nice-to-have accessory—we are vital to the world. We provide needed services, and sometimes, our aircraft are the only way to accomplish that service.

Part of the HAI Strategic Industry Plan is an expanded website that will feature materials aimed at a general audience that explain the importance of what we do and how we help society work. Of course, our greatest asset is you—the people who fill the cockpits and hangars, the flight lines and manufacturing floors. Whatever your role in aviation, an essential aspect of what we provide our colleagues and customers is our determination to do this aviation thing RIGHT.

Telling our story, however, is only the start. Real engagement features a conversation—a two-way dialogue where both parties not only talk but listen. And here is where I want to recognize our outgoing chair, Jeff Smith, for his decades of work on behalf of our industry. While volunteering with the Eastern Region Helicopter Council and, later, as a member of the HAI Board of Directors, Jeff has been an exceptionally effective ambassador for our industry.

You can read on [p. 15](#) about his successful work on your behalf to address sound complaints in the Washington, D.C., area. Jeff led a data-driven effort to document sound complaints and then worked with government and industry partners to find a way to safely address those concerns. As Jeff says in the article, “We can all work together toward mutually beneficial results when communication and collaboration are involved.”

I challenge everyone reading this to become an ambassador for our industry. Yes, that means telling your story—of the pride you take in your work and how that work contributes to the security, prosperity, and quality of life of those in your community. But it also requires that you listen. What are the concerns of your neighbors? If you lived where they do or viewed your operations from their perspective, what would your concerns be? Then start a conversation.

As always, your HAI team is here to support you; contact me at [president@rotor.org](mailto:president@rotor.org) if you need the conversation to start with us. 

A handwritten signature in blue ink, appearing to read 'JAV', with a long, sweeping underline.



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## Vertical Aviation at the State Level

*HAI's work across the United States ensures members' voices are heard on critical issues such as AAM, community relations, and more.*

**H**AI'S GOVERNMENT AFFAIRS DEPARTMENT manages the relationship between the vertical aviation industry and various levels of government, including local, state, federal, and international. Our team's key role is to advocate for our members' interests and navigate the complexities of the political and regulatory landscape, not only in the United States but also in Europe and South America.

This year, our department has increased its efforts to help shape state and local policies that may affect our industry. This work involves building relationships with government officials, monitoring legislative activities, and influencing policy outcomes in favor of HAI's goals.

All 50 US states have their own legislatures, which operate independently from the federal government. Any state legislator can propose a bill addressing a wide range of issues affecting aviation, including infrastructure, taxation, and workforce development. And because state legislation tends to move more quickly

and become law at higher frequency than at the federal level, it's important for HAI to track such legislation thoroughly and regularly.

In the past five months, HAI has tracked more than 180 state bills, including multiple bills concerning advanced air mobility (AAM), infrastructure, sales taxes, and both sound and aviation fuel regulations.

### **AAM in Texas and California**

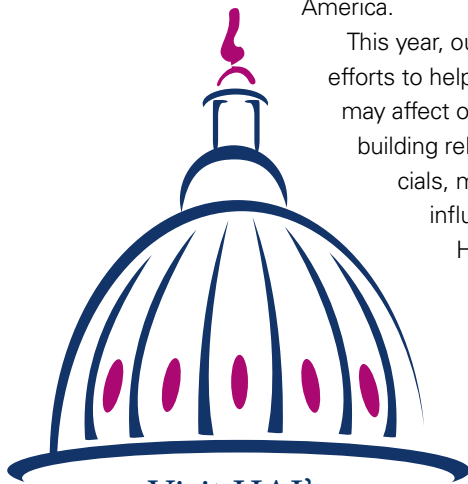
In the past two months, Texas introduced H.B.2678 and companion bill S.B.2144, concerning AAM technology. S.B.2144 was recently enacted, which means that the

Texas Transportation Commission will appoint an advisory committee to assess current state law, identify potential changes needed to facilitate the implementation of AAM technology in the state, and develop a statewide plan for its implementation. The advisory committee will comprise members from diverse geographic regions of the state, local law enforcement, the AAM industry, local governments, and the public, as well as transportation experts, commercial airport representatives, and vertiport operators.

In addition, the Texas Department of Transportation (TxDOT) will be required to review existing state aviation standards and guidelines, airport facility planning, and compatibility guidance to ensure their applicability to AAM. TxDOT will also be required to support the development of federal and industry standards for AAM technology that prioritize safety and to develop a statewide plan specifying potential locations for and classifications of vertiports and other associated infrastructure to guide the future operational environment of AAM.

HAI submitted written testimony supporting H.B.2678 and S.B.2144. In addition, we submitted a coalition letter with some of our AAM industry peers expressing our united support and engaged with state legislators to ensure the secure passage of these two bills.

California has introduced a similar AAM bill. If enacted, S.B.800 would require the California Department of Transportation, in coordination with the Office of Planning and Research and the California Air Resources Board, to establish an advisory committee to assess, among other things, pathways for feasible implementation of electrification goals for the aviation industry and require the committee to report its findings and recommendations to the department and the legislature no later than Jan. 1, 2025. Currently, the bill has passed the California Senate Transportation Committee with no opposition and is under further review by the California Senate Appropriations Committee.



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HAI, with other AAM industry leaders, submitted written testimony stating our dedicated support for the enactment and implementation of S.B.800. We are encouraged to see states such as Texas and California help facilitate the safe, efficient transition of AAM into the state market.

### Indianapolis Downtown Heliport

On Feb. 7, 2023, the FAA released a notice of intent regarding a proposal to permanently close the Indianapolis (Indiana) Downtown Heliport and change 5.36 acres of land from aeronautical use to nonaeronautical use and to authorize the sale of all heliport property located at the heliport. The Indianapolis Airport Authority (IAA) has submitted a request to release the Authority from federal Airport Improvement Program (AIP) obligations associated with the heliport.

This is not the first time the IAA has submitted a request to close the heliport. In November 2021, the authority deemed the continued operation of the heliport a financial burden that outweighed the facility's public value. When IAA filed its first request, HAI led a coalition letter to oppose the closure. By uniting 16 associations, airports, and companies, we were able to keep the heliport open for business.

Almost two years later, HAI remains engaged on the issue and is determined to work with multiple stakeholders to keep the Indianapolis Downtown Heliport open for business. The facility provides the city with tremendous public value through intermodal transportation connectivity, economic growth, jobs, future air mobility access, and crucial public services such as law enforcement and air medical access. Just as we did in 2021, HAI is striving to keep the heliport open, through either continued city operations or a change of sponsorship.

### Hawaii and Federal Preemption

The United States currently enjoys the safest, most robust aviation system in the world. Central to this preeminence has been the existence of a single federal system of aviation policy and regulation that the aviation industry, its employees, its customers, and the public rely on and entrust with protecting their well-being.

The doctrine of federal preemption helps maintain consistency and avoid conflicts between federal and state laws. It ensures that federal laws have the ultimate authority in areas where the federal government has exercised its authority.

Protection of this single, federal, standardized framework is integral to continued FAA and US leadership in safety, innovation, and transportation options for all communities.

At the start of 2023, Hawaii's House and Senate introduced companion bills H.B.1201 and S.B.969, respectively. If they had been enacted, the legislation would have conflicted with federal law. Both bills proposed that noise of more than a certain decibel level generated by helicopters should be declared a public nuisance and considered a source of noise pollution in violation of the state's noise pollution law.

Furthermore, H.B.1201 and S.B.969 would have established fines and a private right of action for individuals to sue helicopter owners and operators for creating a public nuisance. Yet, the responsibility of regulating air traffic, and the noise related to that air traffic, belongs exclusively to the federal government. Any state or municipal effort to regulate in this area is subject to constitutional challenge and will be preempted by federal law.

After submitting multiple joint written testimonies with the Aircraft Owners and Pilots Association (AOPA) and contacting multiple members of the Hawaii Senate

Transportation and Judiciary Committees to express our strong opposition and provide information about federal preemption, both bills were deferred by the Hawaii Senate Judiciary Committee.

The Judiciary Committee stated that Hawaii has no jurisdiction over this matter and deferred the bill due to federal preemption of aviation regulations, meaning that the state cannot itself interfere with aircraft operations and cannot authorize private litigation that interferes with aircraft operations.

As always, the helicopter community strives to be a good steward of the environment and a good neighbor to residents who live and work in the Aloha State. While



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we appreciate the issues that S.B.969 and H.B.1201 intended to address, the proposed bills presented many impractical, unlawful, and logistical problems.

HAI remains committed to working with other operators, legislators, leaders, and community members in every state to proactively address concerns and answer questions regarding vertical aviation and its role in the community.

## **Environmental Issues**

In February, the California Senate introduced S.B.720, which, if enacted, would require each public or private airport in the state to report to both the California Department of Transportation and the California Air Resources Board the regulations, incentives, and measures the airport is deploying to achieve net-zero greenhouse gas emissions from its operations.

The bill also includes a requirement for each public or private airport that has a high volume of private flights with low passenger capacity in a disadvantaged community to report to the department and to the relevant air quality management district its efforts to mitigate environmental injustice, poor air quality, and other effects on neighboring communities.

The bill stipulates that both reports would be integrated into the airport's sustainability plan, and if the airport does not have a plan, it must file its reports on or before Jun. 1, 2024.

HAI and AOPA, the National Air Transportation Association (NATA), and the National Business Aviation Association (NBAA) submitted a coalition letter opposing S.B.720.

Of significant concern to our industry is the fact that the legislation's requirements are impossible to fulfill. Airports lack the practical and legal ability to ascertain the passenger occupancy or cargo loads of an aircraft and to determine the trigger for "low occupancy."

This bill would affect 242 public-use airports and a few hundred private-use airports in California, many of which don't have towers and aren't attended 24 hours a day, making reporting requirements infeasible and highly burdensome. Many airports are already understaffed and underfunded as well; additional burdens could impede their efforts to operate safely and efficiently.

## **Sales and Use Tax Exemptions**

Recently, Texas State Rep. Ernest Bailes IV (R-18) introduced H.B.3003, which, if passed, would eliminate taxes on aircraft repair, remodeling, and maintenance services. The relief would also apply to machinery, tools, supplies, and equipment used exclusively for the repair, remodeling, and maintenance of aircraft. Additionally, any tangible personal property that is permanently affixed or attached to an aircraft as a component part would be exempt from taxes.

It's important to note that the general aviation industry has a massive economic impact in Texas, with a sizable portion coming from aircraft maintenance. However, the current taxes on aircraft parts put the maintenance business at a competitive disadvantage. Aircraft parts are exempt from sales taxes in almost all adjacent states and 35 states nationwide. H.B.3003 aims to create more jobs in aircraft maintenance, which is a labor-intensive industry that provides highly skilled, high-wage employment. Therefore, HAI fully supports and looks forward to the passage of this legislation.

Massachusetts, meanwhile, has introduced a budget amendment (Amendment 4) to H.B.3770 that would repeal that state's aircraft sales tax exemption. A major factor in Massachusetts's economic success is a regulatory framework that provides a distinct competitive advantage compared with neighboring states. The aircraft sales tax exemption, which Amendment 4 aims to repeal, has been a major motivator in deciding where to base aircraft. The 2002 sales tax exemption gave way to a booming aviation maintenance sector and an increase in Massachusetts-based aircraft that now generates in-state revenues of approximately \$1 billion annually.

Notably, states that experience the broadest range of industry growth employ a comprehensive aviation incentive plan extending to both aircraft and maintenance. The sales tax exemption on aircraft storage, sales, and maintenance has attracted major corporations to increase their fleet size and carry out all facets of maintenance and modification within the state, supporting aviation jobs and the airports that rely on them. Eliminating the aircraft sales tax exemption would harm aviation jobs and airports in Massachusetts. Therefore, HAI opposes Amendment 4 of H.B.3770 and has urged the state House Ways & Means Committee to oppose it. [🔗](#)



# ROTOR WASH

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

## HAI BRIEFS

### HAI, ERHC Help Bring Route, Zone Changes to Washington, D.C.

**MODIFIED HELICOPTER** routes are coming to the North Capital Region, which comprises areas of Maryland, Northern Virginia, and Washington, D.C., thanks to a successful partnership involving US House Rep. Don Beyer (D-Va.-08), the FAA, HAI, and the Eastern Region Helicopter Council (ERHC).

"This has been a very successful program all around," says Jeff Smith, chair of the HAI Board of Directors. "This all came together exactly how it should have, with industry and government



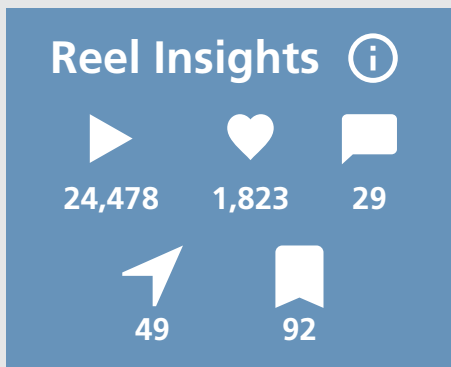
communicating and working together to come to a solution.

"A lot of credit goes to Representative

Beyer. He's a real pragmatist, and he worked with us to accomplish tangible results," Smith continues. "He was also instrumental in getting local municipalities on board to continue to fund data-gathering a year past when our study ended, to help determine the benefits of the changes. His leadership illustrates how well we can all work together toward mutually beneficial results when communication and

collaboration are involved."

Last year, in response to recommendations from a 2021 report that Rep. Beyer ➤




**HAI Brand Ambassador and helicopter maintenance tech Faith Ortega** took an HAI Professional Development Course in survival and egress training at HAI HELI-EXPO 2023. As a mechanic, Faith often works with helicopter flotation devices, so her participation in the course—which started in the classroom and ended in the pool—attracted followers and nonfollowers alike to the tune of 24,481 views and 1,993 engagements!

# HAI

## ON SOCIAL

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► requested from the US Government Accountability Office (GAO), and with the support of the FAA, HAI and the ERHC launched a six-month study of regional rotorcraft sound. Working in partnership with aviation noise consultancy PlaneNoise, the participants gathered data through sophisticated flight tracking and correlated it with helicopter sound complaints to identify opportunities to make altitude and zone changes to routes. The FAA Eastern Region was instrumental in bringing in local air traffic representation and working to balance the needs of the industry and elected officials during the project.

The partners' findings were shared with helicopter operators including the US Department of Defense and other federal agencies, air ambulance services, and other stakeholders in the Washington, D.C., metropolitan area to determine what changes to routes each could make or accept. Their feedback was incorporated in the final assessment.

The new changes include altitude increases in helicopter routes 2, 3, 5, 6, and 7 and lateral zone boundary and altitude changes in zones 1, 2, 3, and 5 as depicted on the FAA's [Baltimore-Washington Helicopter Route Chart](#). The changes, announced in April, are expected to go into effect in June 2023.

**HAI BRIEFS**

## HAI Members Elect 2023–24 Board of Directors

IN THE DAYS LEADING UP TO HAI HELI-EXPO 2023 in Atlanta, Georgia, HAI members selected their board of directors for fiscal year 2023–24. HAI members reelected current board members Nicole Battjes, Randy Rowles, and Mark Schlaefli and also elected Paul Gottwig, who will fill

a government service seat. Gottwig replaces B. Adam Hammond, who chose not to return to the board. Gottwig's three-year term will begin Jul. 1, 2023.

"I am pleased to welcome Paul to our board," says Jeff Smith, current HAI Board chair. "And I speak for the board and our industry in extending my deepest appreciation to Adam for his service. Adam served to support our members and the vertical aviation industry, and I believe Paul will very capably serve as the representative

### *HAI and the ERHC launched a six-month study of regional rotorcraft sound. Their findings helped determine the new route updates.*

for government service on this board."

While HAI member operators select the board members, the board itself selects its panel of officers each year. Beginning on Jul. 1, 2023, the following board members will serve a one-year term as officers:

- Chair Nicole Battjes, Rainbow Helicopters
- Vice Chair Mark A. Schlaefli, Dakota Rotors
- Treasurer Rick Kenin, Boston MedFlight
- Assistant Treasurer Brian Jorgenson, Timberline Helicopters.

"I appreciate the effort our members have put into the election of their board of directors," says James Viola, HAI president and CEO. "This board has extensive experience across a wide section of our industry. The people on our board are proactive in addressing significant issues in our industry, such as creating working groups focused on workforce development and aviation insurance. Their goal is to improve our industry, and I am grateful for their assistance."

Gottwig explains why he wants to serve as an HAI board member. "My initial

intention is twofold," he says. "One is to help out the membership of HAI in any way possible but, more specifically, to aid HAI's efforts in meeting the government service industry's needs in terms of pilot, crew member, and mechanic hiring.

"Second is to work with the other members of the board on creating working groups and committees to interface between federal, state, and local governments and the FAA; [helping] individual helicopter operators achieve better contracting opportunities; and clearly defining safety and performance guidelines for aircraft and aircrew requirements to aid our industry's safety initiatives," adds Gottwig.

Gottwig is also looking forward to future generations of technology and aircraft. "I'm excited to be able to help guide the organization as a whole in embracing and involving new technologies that fit the vertical lift definition into our membership, such as drone operations and tiltrotor operations.

These are new and rapidly evolving vertical lift groups that, if properly integrated, [could] positively change the way helicopters operate inside the vertical lift industry."

The results of the election were tabulated and certified at HAI's annual membership meeting on Mar. 6 based on ballots HAI members had submitted electronically leading up to the event.

All HAI member operators are eligible to run for future HAI Board vacancies. For more information, contact James Viola at [president@rotor.org](mailto:president@rotor.org).

**HAI BRIEFS**

## HAI Seeks Members for Small Business Initiatives Industry Advisory Council

LARGE BUSINESSES IN OUR INDUSTRY have the funds, weight, and connections to meet their business needs and challenges. But what about the small and ►

# HAI 2023–24 Board of Directors



**CHAIR**

**Nicole Battjes**

Rainbow Helicopters  
Honolulu, Hawaii, USA  
*Commercial Aviation*



**VICE CHAIR**

**Mark A. Schlaefli**

Dakota Rotors LLC  
Custer, South Dakota, USA  
*Commercial Aviation*



**TREASURER**

**Rick Kenin**

Boston MedFlight  
Bedford, Massachusetts, USA  
*Commercial Aviation*



**ASSISTANT TREASURER**

**Brian Jorgenson**

Timberline Helicopters  
Sandpoint, Idaho, USA  
*Commercial Aviation*



**PRESIDENT AND  
CHIEF EXECUTIVE OFFICER**

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Helicopter Association International  
Alexandria, Virginia, USA



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**Paul Gottwig**

Los Angeles County Fire Department  
Los Angeles, California, USA  
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**DIRECTOR**

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## BENEFIT OF THE MONTH

# Flight Training and Checking

*HAI's new program is your fast pass to fly, train, and check.*



### SKIP THE WAIT AND GET YOUR CREW BACK IN THE AIR.

The HAI Flight Training and Checking Program, created in partnership with Helicopter Institute, gives HAI member operators a fast pass for their aircrew's training, testing, and certifications.

Available for Part 135 and Part 91 operators, this HAI-exclusive program is approved and accepted by insurance underwriters for a streamlined, all-in-one approach. Under the program, operators can:

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- Customize the program to meet needs across multiple pilots, aircraft, and missions
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➤ medium-sized businesses competing in many ways for the same resources?

HAI wants to learn more about the business-related challenges facing small and medium-sized HAI member companies in their daily operations so the association can develop programs and benefits to support them. To help gather this information, the HAI Board of Directors has formed the Small Business Initiatives Industry Advisory Council (SBI-IAC) and invites small and medium-sized HAI member companies to participate.

"We're looking beyond aircraft operation," says HAI Senior Director of Operations Chris Martino. "We want to know what challenges our small and medium-sized member companies face in running their businesses, in human resources, employee benefits, labor, accounting, marketing, accessing regional

business programs—those kinds of daily concerns."

HAI is seeking a diverse group of 20 members representing small and medium-sized businesses to form the SBI-IAC, whose first meeting will be in July 2023. The council will meet on an as-needed basis, with the initial goal of meeting monthly through the end of 2023.

All HAI members in small to medium-sized businesses are invited to join, from aircraft operators and maintenance facilities to product manufacturers and service providers, such as insurance brokers and parts suppliers.

Interested HAI members can contact Chris Martino at [chris.martino@rotor.org](mailto:chris.martino@rotor.org) to express their interest and request more information.

### HAI BRIEFS

## Rotors 'n Ribs Landing in July

ROTORS 'N RIBS, ONE OF THE LARGEST gatherings of helicopters in North America, will take place once again on Jul. 7 and 8 at Goshen Municipal Airport (KGSH) in

Goshen, Indiana. The free event is

open to attendees who have registered on the [Rotors 'n Ribs website](#), regardless of whether they fly or drive to the airport.

Rotors 'n Ribs includes educational

seminars, aircraft flight demonstrations, a nighttime drone performance, food (the "ribs" in the event title!), and the opportunity for attendees to attempt to



By Dan Sweet

help set a Guinness World Record.

"We're hoping to set the record for the largest number of civilian helicopters hovering over a field," says Randy Sharkey, event organizer, helicopter pilot, and manager of Goshen Municipal Airport.


Rotors 'n Ribs began in 2013 as a helicopter fly-in and has expanded into a much larger helicopter event as a way for rotorcraft professionals to build industry camaraderie, network, gain safety education, and share helicopters with the general public.

The event begins at 3 pm on Friday, Jul. 7, with aircraft arrival, followed by a social hour, food trucks, and welcoming remarks. The general public is invited to join the first day of Rotors 'n Ribs to build awareness of and appreciation for rotorcraft.

Friday's schedule also includes several entertaining helicopter demonstrations, from a Bambi Bucket drop to a pyrotechnics-filled Army Aviation Heritage Foundation (AAHF) Sky Soldiers performance. The AAHF will provide limited helicopter rides on either a UH-1 Huey or an AH-1 Cobra. The first day of Rotors 'n Ribs will conclude with a drone light show followed by fireworks.

Saturday, Jul. 8, is open to helicopter professionals and enthusiasts and includes breakfast; a BBQ rib lunch; a safety seminar by Bruce Webb, director of aviation education and community outreach for Airbus; educational sessions sponsored by HAI; and the Guinness World Record hover attempt before helicopters begin to fly out at 2 pm.

Sharkey expects that Rotors 'n Ribs will enjoy close to 50 helicopters in attendance over the two days. Fly-in attendees can camp at their aircraft or reserve a hotel-block room in the area.

To register for the event, which ensures free entry, parking availability (\$20 per car), and access to educational seminars and free meals for rotorcraft professionals, visit [rotorsnribs.com](http://rotorsnribs.com). 

## Crisis Communications

*What to say (and not say) after an accident.*

**AS THE OLD MAXIM GOES,** the point in your flight when the engine quits isn't the time to begin practicing autorotations. And similarly, the period immediately after a crash is not the time to cobble together a post-accident communications plan.

No matter how safely an operation runs, accidents happen in aviation. When they do, companies must be prepared to communicate quickly, accurately, and effectively. Below are five crucial elements to consider when crafting your organization's crisis communications plan.



Dan Sweet, HAI's director of public relations and communications, led a course in crisis communications during Communications U for Small Businesses at HAI HELI-EXPO 2023. (HAI/f-stop Photography)

**1 DO plan ahead.** Particularly in today's social media climate, speed is essential when communicating to the public after an accident, so develop and employ a structured plan for how to address a crash and make sure your employees know how to use it. Update the plan as needed and at least annually.

**2 DON'T delay.** Own the narrative by speaking first; don't give the media or anyone else the opportunity to fill a communications void. Likewise, don't suspend communications too early. If the US National Transportation Safety Board (NTSB) is involved, your role doesn't end when the NTSB takes over media communications. Be prepared for a possible second wave of media attention after that organization issues its report.

**3 DO tell the truth.** It might be painful at the time, but lying or omitting details could hurt your reputation and potentially expose you to liability. Without your honest input, outside media sources, including social media, can quickly spiral away from the facts of an incident and create damaging conjecture.

**4 DON'T trust a microphone.** Treat every microphone as if it's live, and speak accordingly. And, remember, cell phones have recording capabilities too!

**5 DON'T say "No comment" to a reporter.** It sounds like you're hiding something. If you need time to formulate an answer, tell the reporter you'll need to get back to them—and then be sure to follow up.

By Jen Boyer

## Robert Burns, Recipient of HAI Pilot Safety Award

*He flew 31,000 hours in a career without an accident or incident.*

**R**OBERT BURNS, 88, of Charlotte, North Carolina, accomplished something no other pilot has achieved: over his career, he flew 31,000 hours without an accident or incident. The military and, later, power-line utility pilot certainly had his share of emergencies, yet he handled each one without mishap. He was recognized for this unequaled accomplishment with an HAI Pilot Safety Award at HAI HELI-EXPO 2023 in Atlanta, Georgia, in March.

ROTOR caught up with Burns to learn about his experiences as a pilot and the secret to his astounding achievement.

### **ROTOR: What sparked your interest in flying?**

**Burns:** I'm an Iowa farm boy, raised on a farm with cows and machinery. We used to take summer vacations in Minnesota on Kabetogama Lake. They had amphibious-plane concessions there, and as I recall, when I was

10 years old, my dad said, "Well, I'm not going up in that thing, but you kids can."

My sister and I took a ride in one. The pilot let me sit next to him. He had to kind of sway the airplane to eventually leap out of the water. He just kind of pulled the yoke back and forth. He said it really took some finesse to get it off the ground. I thought, well, that looks like that would be a challenge. So that was my first exposure to flying, and I thought that could be something to look into for a career option.

After high school, I did two years of college, then joined the [US] army. Back then, there was compulsory military service for two years. The military recruiter saw I was mechanically inclined, having worked on a farm with all the machinery. He started telling me about the helicopter, and he said that might be a way of the future for me. He said he couldn't guarantee I'd get into flight school but he could guarantee I could be a mechanic and



HAI President and CEO James Viola (left) and Senior Director of Safety Chris Hill present Robert Burns (center) with the HAI Pilot Safety Award at HAI HELI-EXPO 2023. (HAI/f-stop Photography)

then I could apply for pilot training once I was in. Had I known two out of three guys don't make it, I'd probably not have jumped at the chance.

As it turned out, after I completed my maintenance training two years in, I was finally able to start flight training. In basic training, we flew the H-23, a little piston Hiller. I went straight through training without any hang-ups or anything. I just really picked up flying very quickly. I went on to the advanced course for the Piasecki H-21, a helicopter for troop transport, resupply, assault missions—that sort of thing. We did external-load sling work with it too.

After nine months of training, I was sent back to Fort Bragg [North Carolina] and put on a strategic air command unit that was supposed to be ready to ship out in 24 hours to go to war. We and another unit were deployed to Vietnam, and we were the first units to turn rotor blades in Vietnam, in 1958.

### **How did you turn your military flying experience into a civilian career?**

I flew four and a half years in the army and got out in 1961. When I got home, I sold insurance for three years as I waited for a helicopter job opening. When I applied for my civilian license, I had more hours than the civilian instructor pilot who flew with me for that rating.

After getting my civilian rating, I applied for different jobs, and I found one in Myrtle Beach, South Carolina, at Inland Airlines. They had piston Bell 47 helicopters. Their primary contract was with utility companies. We did transmission-line inspections and anything else people wanted with a helicopter, including photo flights, Santa Claus deliveries, and helicopter rides.

Most of the time, though, I was flying power-line patrol. That consists of flying as close as you comfortably and safely can to the power line for visual inspections. They were long hours. I could log 1,000 hours a year just doing power lines. We worked for two power companies, one in North Carolina and one in South Carolina. I'd fly one month in North Carolina and then in South Carolina the next month. I worked for Inland for 20 years; then, the power companies decided they wanted to upgrade to a Bell JetRanger. My boss didn't have one of those, so I lost my job.

Thing was, I knew the power companies like no one else, so I got a Bell checkout in the 206 JetRanger. I had to bootleg some time around to get the minimum hours to qualify for the job for commercial applications. Then I

started applying to and working for whichever contractor had the utility contract. Of course, I still flew all the other jobs the contractor needed—putting air conditioners on roofs and replacing objects that were too difficult for other machines to lift. We even set telephone poles that were rigged up the slopes. They'd dig the hole and I'd take the pole up, drop it in the hole, and go back for another one. Anything you could do with a helicopter, we did. My last flight was in 2001.

### **Which flight stands out most in your mind?**

We had one rescue that was very interesting. We were patrolling the power line. The metal support structures holding the 44,000-volt, three-phase line had crossarms. On that day, I saw two little heads above the crossarm. We flew up there, and we found two little boys sitting on the crossarm. One of them had been on a high-voltage line and had burned himself. He was flailing around. Emergency crews were there, but they didn't have anybody trained to do this type of rescue.

I happened to have an experienced lineman with me who had just undergone the training for removing a man from a tower by climbing up the tower, securing the man in a proper way, and bringing him down. We landed and talked to the rescue crew. We radioed the power company and had the power turned off. The lineman climbed up there in his regular shoes—he didn't even have his line shoes—and brought the boy down. The boy lived, and he's fine to this day.

### **Thirty-one thousand hours without an accident or incident is impressive. Surely you had mishaps along the way?**

I describe helicopter flying as hours of boredom interrupted by moments of stark terror. I've had several partial- and full-engine failures. If the engine sputters or quits altogether, you have just a second or three to react. An engine failure is where your pay grade is really earned.

I always had someplace where I could put the helicopter when the engine failed. I landed in a garden one time, in a farmer's field one time, and, in the military, when we had an engine failure after passing over a ravine, we landed in a paddy.

I have a habit of always checking my gauges every minute or so. I looked down one time and saw there was zero oil pressure. About that time, it started to get rough and I thought, well, I'm gonna find a place. I

continued

started to head for a place, and before I got to it, the cylinder seized and blew the jug completely off. This was a six-cylinder Bell 47 engine. I kind of just smiled and thought, here's my chance to prove I can handle an emergency. I was able to autorotate and land it just as smoothly as a practice autorotation.


**What advice would you offer for a pilot who would like to achieve their own accident- or incident-free career?**

Don't ever give up on it. You know you can't sit there and freeze and hope that something will happen. You have to take action. It happens just so fast. You have to do the right thing, and that's where the skill comes in. You can get into situations in a helicopter where your job exceeds your skill and you just can't recover. It's good to practice those skills. That's what you get in 31,000 hours—a lot of practice.

It isn't just a matter of training, though. You have to

focus. It was different then. The Bell 47 had no GPS, governor, or other system to help. You had to fly every minute, navigate, maintain rotor rpm, all of it, every minute of the flight. When I went to HAI HELI-EXPO 2023, I saw the helicopters of today, which are just so amazing. Nowadays, helicopters have this controller stabilization augmentation, or autopilot, and other systems where you can just set it up and it'll fly itself.

When I was in the military, I had an accident with a saw and lost my last three fingers on my right hand above the first joint. I was able to recover and prove I could still fly and climb up that H-21 for preflight, which was no easy thing to do with a weak hand. But 80% of the use of your hand is in your thumb and first finger, so I was able to prove I could fly just as well, and that's how I flew my entire career.

I would say that if you're determined to do something, if you can find a way to compensate for whatever is the issue, you can succeed. 



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# ROTORCRAFT EVENTS

2023

**JUL. 7–8**

**Rotors 'n Ribs Fly-In**

Goshen Municipal Airport (KGSB)

Goshen, Indiana, USA

Learn more at [rotorsnribs.com](http://rotorsnribs.com)

**JUL. 17–22**

**APSCON / APSCON UNMANNED 2023**

Airborne Public Safety Association

Orlando, Florida, USA

Learn more at [publicsafetyaviation.org](http://publicsafetyaviation.org)

**Visit HAI at Booth #312**

**JUL. 24–30**

**EAA AirVenture Oshkosh 2023**

Experimental Aircraft Association

Oshkosh, Wisconsin, USA

Learn more at [eaa.org](http://eaa.org)

**Visit HAI at Booth #363**

**SEP. 23**

**9th Annual Girls in Aviation Day**

Women in Aviation International

Worldwide event

Learn more at [wai.org/giad](http://wai.org/giad)

**OCT. 9–10**

**16th Annual HeliSuccess Career Development Webinar & Job Fair**

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National Business Aviation Association

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Association of Air Medical Services

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**NAAA Ag Aviation Expo**

National Agricultural Aviation Association

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**DEC. 9–11**

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Learn more at [rotor.org](http://rotor.org)

# FLYOVER

HUNTINGTON BEACH, CALIFORNIA | APR. 18, 2023

HUNTINGTON BEACH POLICE AIR SUPPORT UNIT | MD HELICOPTERS MD 530F

PILOT: OFFICER TYLER HANSON

TACTICAL FLIGHT OFFICER: OFFICER TREVOR JACKSON

PHOTO BY MARK BENNETT





ZONE 1	GREEN 1	R	V	HLA
ZONE 2	BROWN 2	R	V	HLA
ZONE 3	RED 3	R	V	HLA
ZONE 4	BLUE 4	R	V	HLA
ZONE 5	ORANGE 5	R	V	HLA
ZONE 6	PURPLE 6	R	V	HLA
ZONE 7	PINK 7	R	V	HLA
ZONE 8	YELLOW 8	R	V	HLA
ZONE 9	BLACK 9	R	V	HLA
ZONE 10	WHITE 10	R	V	HLA

PD1  
PD2  
PA





# Nicole Battjes

## ‘We Know Where We’re Going’

New HAI chair to focus on strategic initiatives, rebranding.

By Christine Knauer

**I**N A BRIGHT, SUNNY MORNING in Oahu, Hawaii, a few months before she'll begin a one-year term as chair of the HAI Board of Directors, Nicole Battjes conducts a preflight inspection on one of the eight helicopters in the fleet operated by Rainbow Helicopters, the Honolulu-based air tour operation she founded in 2011.

An optimist, Nicole lives by the spirit of “aloha,” a Hawaiian word that signifies kindness, compassion, and community. She also embraces the mantra “Don’t quit before the miracle happens.” This philosophy appears throughout Nicole’s life and may be the reason she thrives today.

When she takes the reins at HAI on Jul. 1, 2023, Nicole will lead the board through a pivotal point in the association’s history. As part of a three-year initiative, HAI is rebranding. The change means a new name and logo, but

it’s really about expanding the association’s mission to encompass a bigger, bolder vision of vertical aviation that includes all vertical aviation operations.

Rebranding is a huge undertaking, but it’s one Nicole has accomplished before, at Rainbow Helicopters. Based at Honolulu International Airport (PHNL), Rainbow offers aerial tours of the island of Oahu, private charters, photography and videography flights, and flight instruction. Its 12 pilots fly up to 32 flights a day, 365 days a year, flying more than 7,500 flights annually in a fleet of two Airbus AStars and six Robinson R44s.

Rainbow maintains its helicopters in-house, providing both routine and preventive maintenance. As an authorized Robinson service center and dealer, the company also overhauls its R44s. With 3,500 flight hours, Nicole serves as CEO, director of operations, check pilot, and flight

instructor, but she also relies on a team of 50 employees—“the best team in the world,” Nicole says—to keep the whole operation running smoothly.

## Her Own Path

The desire to create her own path emerged early in Nicole’s life. As a child growing up in a small town in Michigan, she knew two things: she wanted to be a pilot, and she was intrigued with business, sales, and marketing. “I was the girl selling candy bars out of my locker in seventh grade,” says Nicole.

She earned her pilot’s license at 18 and developed her own undergraduate degree at Eastern Michigan University, combining courses in business, aviation, and communications. Fixed-wing aviation lost a future entrepreneur when Nicole took a helicopter flight while in college and decided to pursue a career in vertical aviation.

After college, Nicole packed her belongings in her Honda Accord and moved to California for some early helicopter training and to work for Sonoma Helicopters. Along with managing the administrative side of the business and assisting with marketing and sales, she helped the small helicopter flight school pursue a Part 135 certificate, a task even seasoned aviation experts find daunting.

“They had one R44 and two R22s,” recalls Nicole. “The

owner wanted a Part 135 certificate so they could fly on-demand charters to the wineries. I had no experience in that, but I knew I could figure it out.”

Nicole deciphered the complex Part 135 application process by reading, studying, and consulting with friends and connections across the industry, including the Ninety-Nines, the International Organization of Women Pilots.

“I learned a lot about regulations and the FAA and how the infrastructure of a Part 135 certificate was written and built,” Nicole says. “In addition to the administrative side, I looked at the practical aspects of becoming a Part 135 operator, which is huge. How does it get implemented in a company? What privileges do you have as a 135 operator? This experience built my confidence that I could do the same thing for myself. When I started Rainbow, the first thing I did was put in an application with the FAA for a 135 certificate.”

While at Sonoma Helicopters, Nicole earned the Amelia Earhart Memorial Scholarship from the Ninety-Nines, giving her the opportunity to complete her commercial helicopter training. With an idea for a business and the freedom to go anywhere for the training, Nicole chose her own path once again—in Hawaii.

“I came to Hawaii because it’s so beautiful. I wanted to live in a climate that I could fly in every day. I also wanted



Nicole chose Hawaii as her permanent home in part because she wanted to live in a climate where she could fly every day. (HAI/Andy Stenz)



reservations, shuttling customers back and forth, flying tours, and repeating the process again as many times as possible each day. After about six months of operating, Nicole was able to hire her first employee, a reservationist and shuttle driver.

“Leasing my first helicopter was a pivotal moment. I was really young. I had to earn credibility and build my business. Being a young woman in a male-dominated industry, I may have faced more barriers, but I never quit,” says Nicole. “I’ve never seen myself as unequal. My vision, my voice, and my capabilities are equal to anyone else’s.”

Nicole started her first helicopter tour company at 27. (Nicole Battjes Photo)

to live in a place that had diversity and culture,” says Nicole, who now considers Hawaii her permanent home.

### Building Rainbow

On Jul. 13, 2011, at just 27 years of age, Nicole started her company and launched her entrepreneurial vision. Over the next 18 months, she developed contacts, learned about the tour industry in Hawaii, and eventually leased her first helicopter and began flying tours. In the beginning, Nicole handled everything: answering the phone, scheduling

As we speak by phone in April, Nicole reflects on another crucial role: mother. She and her husband, Mark, have a 2-year-old who will shortly become a big brother when Nicole gives birth right around the time she becomes HAI chair—certainly a first for the association.

She credits Mark with being her constant advocate. “We met two years after I started my business, which I was very focused on growing, and he wasn’t intimidated by that at all. He believes in my vision and continually contributes to it. Mark is my biggest support.”

Nicole discusses the results of a 100-hour inspection on a Robinson R44 with Rainbow aviation maintenance technician Genevieve Starren. (HAI/Andy Stenz)



Running a business while building a family is challenging, and Nicole credits “a huge army of support” with helping her balance her work and home responsibilities. She also points out that being a mother has taught her a valuable business lesson. “Having my first child was a life-altering event that significantly changed my perspective. It forced me to become a better leader by efficiently devoting time and energy to family and the business to ensure that both thrived.”

Nicole believes the demands of motherhood have helped her focus on what’s important, both at home and at work. “When you have a child, you get really good at prioritizing, and your perspective becomes much sharper. Even though being a parent adds responsibility and takes time, it also helps you to make better, more effective decisions.”

As a member of Women in Aviation International and the Whirly-Girls in addition to the Ninety-Nines, Nicole is quick to acknowledge the support she receives from her industry network. “Fellow HAI Board member and former chair Stacy Sheard has been a huge inspiration to me. She had the courage to go out there and dream big,” says Nicole. “It really helps being able to talk through challenges with people like Stacy and other women in organizations like the Ninety-Nines. When you talk through a problem, it cuts it in half.”

Nicole realizes that her story demonstrates the industry’s increasing embrace of diversity. “The fact that my fellow directors elected me—not just a woman but one who will be having a baby just days before I become chair—is a sign of how far we’ve come as an industry. I hope my experience shows that we all have the capacity to create ourselves as leaders, to carve our own path of success. You can be a pilot, you can own a business, and you can have kids and a family.”

## Growing in Tough Times

As with so many businesses, Nicole’s tour operation got hit hard by the COVID pandemic, closing its doors for nearly eight months. But Nicole’s optimistic nature kicked in, and she chose to turn the situation into a positive. “Instead of buying into the doom and gloom, we actually bought an AStar and



Rainbow’s management team: from left, Susan Kim, general manager; Joshua Melaccio, chief pilot; Nicole Battjes, CEO and director of operations; Mike Iven, VP and director of maintenance; and Kamalani Ballesteros, senior operations manager. (HAI/Andy Stenz)

dove into rebranding,” she says. “We decided we were going to come out of the pandemic bigger and better, and we have. We continue to grow, and these last couple of years have been our biggest yet.”

The team considered more than 75 names, but Nicole wanted one with a strong connection to Hawaii. In Rainbow, she found a name that reflects the state’s natural beauty as well as the spirit of aloha she and her team feel for the islands and their people.

“I’m in love with hospitality. I love flying people. I love hosting people. I love everything about Hawaiian hospitality and the tour business,” says Nicole.

She credits a dedication to customer service with propelling Rainbow’s growth. “We call it our ‘mana,’ which is basically our good

spirits,” explains Nicole. “We’re obsessed with treating people well and giving them a good experience. It’s not just the guests; it’s all the people we work with. It’s also the vendors and those who are selling tours for us—everyone.”

With up to 32 flights a day, Rainbow Helicopters is a high-volume operation. Standardizing every process, from flying to maintenance to safety, is critical to its success. Nicole considers implementing a safety management system (SMS) in her business in 2019 to be another crucial moment in her life.

“The SMS really strengthened the trust between team members and the transparency around safety,” she says. Rainbow employees are empowered to speak up when they see a safety hazard and are rewarded for doing so.

“Your team are your eyes and ears,” says Nicole. “They’re the smart people who can identify hazards. Without them, you’re in a much riskier position of not understanding what your hazards and risks are.”

Nicole believes the SMS transformed Rainbow’s culture. “I sort of re-fell in love with my business after I implemented SMS,” she says. “SMS made it a place that everybody wants to come to every day, a place that has a strong mission and a strong sense of community. Before the SMS, we felt like an average company with average problems. Now, it feels like we really know who we are and where we’re going.”

### Leading an Expanding Industry

Nicole joined HAI in 2009 to gain a better understanding of the vertical aviation industry. Having attended every HAI HELI-EXPO® since, she sees firsthand the value of participating in the association’s annual conference and

trade show. “You learn about all the different lines of business and that the opportunities in this industry are endless if you put the effort in.”

Nicole values HAI’s ability to connect the industry. “The biggest benefits of HAI are building relationships, networking, and finding dynamic and workable solutions for industrywide issues. We’re better together as a vertical lift community,” she says, “and all organizations in the industry can rely on HAI to be a trusted resource to address our challenges.

“I try to be the example of what I want to see in the world, in my business, and in my local community. I implemented an SMS at Rainbow Helicopters, and I encourage others to use one. I look for ways to reach out and help companies that are facing the same legislative issues as mine. If we all do that, we’ll be better together.”

Nicole is passionate about vertical aviation and wants

While rebranding her company, Nicole considered and discarded many naming options before choosing Rainbow. “The rainbow is a huge symbol of the beauty of Hawaii, as well as a reflection on the spectrum of its people,” she says. (HAI/Andy Stenz)






to ensure that its role in society is better understood. “A helicopter is not an accessory. It’s vital to the world in so many ways. It’s vital to seeing the world and having joyful experiences, to saving lives in emergency services. It’s vital to keeping the power on and to the military for combat and moving supplies. There are so many more examples, and the expansion of the vertical aviation fleet and missions means that our role is just going to get bigger,” she says. “It’s so important that vertical aviation is accepted and embraced as essential to community life and to our economy.”

Nicole was elected to the HAI Board of Directors in 2020 and helped spearhead the association’s 18-month strategic planning initiative, which yielded a roadmap for the association’s future. The plan details five strategic initiatives for HAI that will position the industry for growth:

- Unify the industry around a new vision of vertical aviation

- Engage the global value chain to create a favorable environment that will help the entire industry thrive
- Elevate the industry’s safety culture
- Develop business resources that will help companies elevate their operational performance
- Build and retain a skilled workforce.

“As an industry, we’re in a time of expanding and refreshing our identity. We’re recognizing that vertical lift has a whole new definition. Whereas historically it primarily denoted helicopters, it now applies to every type of vehicle that can fly vertically. We all share common flight characteristics, which opens up unique missions,” Nicole says.

“I’m so excited and honored to lead the board and the industry through the rebirth of HAI’s identity and the expansion of our mission,” Nicole adds. “I’m thrilled to see what we’ll become over the next 5 to 10 years. I look forward to boldly going where the technology takes us.” 





# HAI HELI-EXPO 2023

## A Celebration of Industry Growth

By Jen Boyer



ENJOY  
the HAI  
HELI-EXPO  
2023 Fly-In  
video

**T**HE HAI HELI-EXPO 2023 THEME “Celebrate,” commemorating HAI’s 75th anniversary year and predicting a bright future for vertical aviation, hit the mark. The Mar. 6–9 show attracted more than 12,400 industry professionals from 97 countries to Atlanta’s Georgia World Congress Center, as well as 639 exhibitors (50 more than last year) and 49 aircraft.

With close to \$2 billion in sales announced during the four-day show, the vertical aviation industry indicated that it is in full recovery and, in many cases, well ahead of where it stood in January 2020, just before COVID-19 spread around the world. Exhibitors reported a steady flow of business on the show floor, reflecting a definite change from last year’s event.

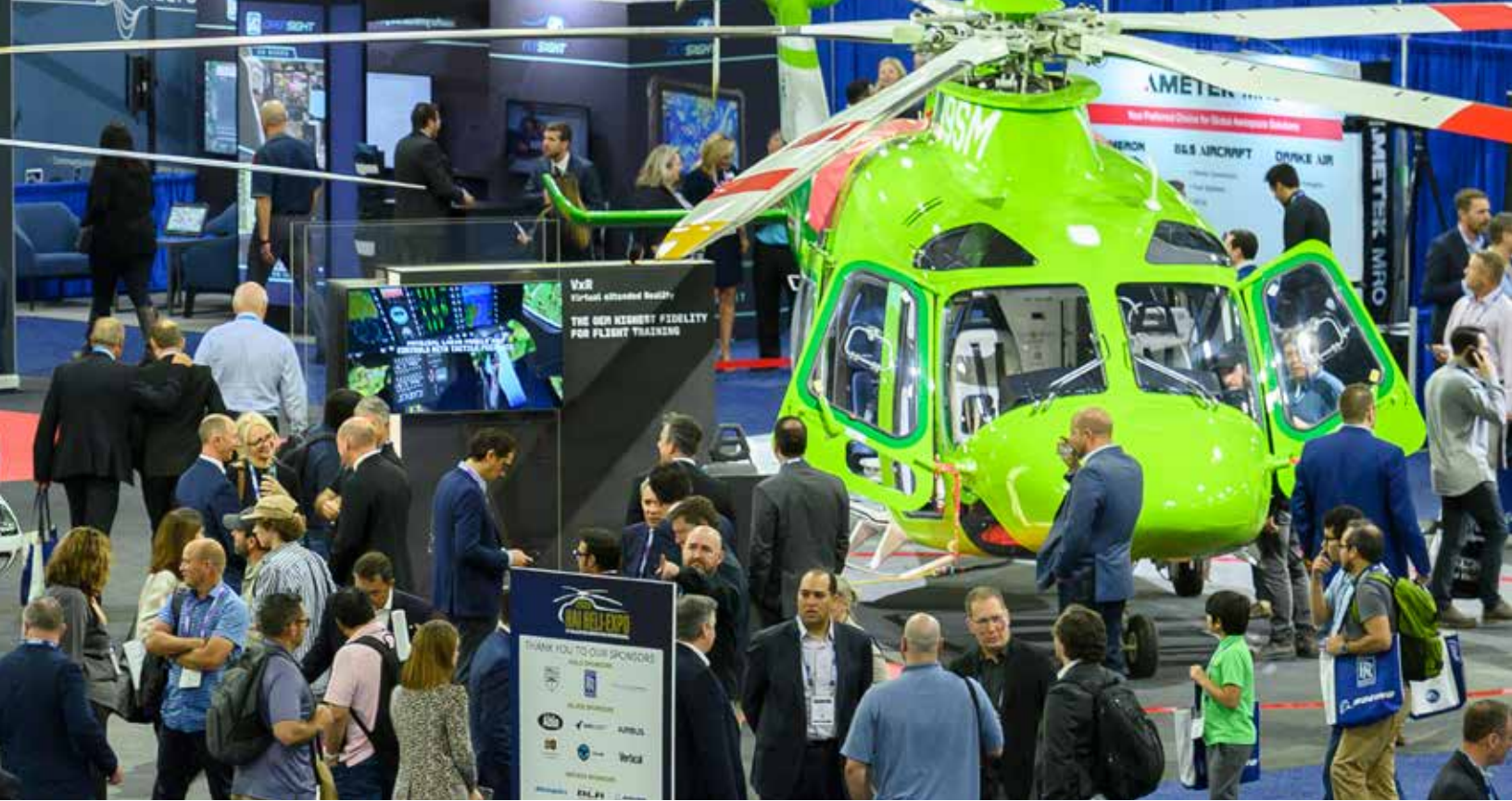
“Everyone I talked with was enthusiastic about the excitement and level of activity at the show,” say James Viola, HAI president and CEO. “This year it was very business oriented. People weren’t just walking the show

floor; it was obvious people were there to do business. Last year, in Dallas, there was more hesitancy—a lot of people were there to look and consider. This year, they were ready to purchase and do what they needed to do for the future of their business.”

### Celebrating a More Diverse Fleet

In a sign of the industry’s movement toward a more diversified fleet, several companies displayed advanced air mobility (AAM) mock-ups, uncrewed aircraft system (UAS) models, and other emerging technologies.

AAM was also a focus off the show floor, in the conference part of the Expo. A three-part AAM Showcase presented discussions on the issues of infrastructure, operations and training, and aircraft that will need to be resolved to successfully integrate AAM operations into the airspace. A forum featuring senior leaders from the organizations working to make AAM a reality rounded out the AAM sessions.



## High attendance and record sales signal better days for the vertical aviation industry.

HAI also released a [Roadmap of Advanced Air Mobility Operations](#), a white paper developed with input from members of the HAI Advanced Air Mobility Industry Advisory Council (AAM-IAC), which describes the next steps necessary for AAM development in areas such as regulations, infrastructure and airspace use, and vehicle development.

### Celebrating Underdog Recoveries

Two vertical aviation OEMs also demonstrated a return to normal operations after difficult circumstances.

A completely rebranded MD Helicopters (MDH) introduced its new leadership and announced ramped-up production. MDH's new president and CEO, Brad Pedersen, an aerospace industry veteran with a proven record of turning around industry companies, didn't hold back when he spoke to reporters.

Pedersen acknowledged the company had fallen short in the past in both customer service and aftermarket support

but said it is already focused on remedying these issues. The company plans to increase deliveries from four aircraft in 2022 to up to 24 a year by 2024, with production focusing on the MD 530 line.

"We have had a rocky heritage, but the bones of the company and the product has always been great," Pedersen said. "Primarily, [our focus now] is aftermarket support and making sure we have spare parts. We have a plan to purchase 702 parts and have all of those in stock by the end of the year. These are the most used and most requested parts with our service centers and with our distributors."

A key limiting factor to increasing manufacturing at MDH is labor: the company had 130 job openings at the time of the show. Pedersen admitted that labor shortages were plaguing MDH more than the supply-chain problems affecting the larger market (see "Supply Chain Woes and Creative Solutions" on p. 36). By strengthening its supplier relationships with longer-term purchase commitments, the company has maintained a steady stream of parts,



From left, Zac Noble, HAI director of flight operations and maintenance and the on-site landing coordinator, guides SureFlight's Bell 407 to a landing at the Georgia World Congress Center for HAI HELI-EXPO 2023, while Jaasmin Foote, HAI social media manager, captures the view. (HAI/f-stop Photography)

ensuring MDH will meet its year-end parts supply goal and growth projections.

A resurgent Enstrom Helicopter Corporation also returned as an HAI HELI-EXPO® exhibitor. After a sudden bankruptcy closed its doors in January 2022, a private owner, Chuck Surack, purchased the manufacturer in May 2022. Enstrom received an FAA production certificate in December 2022 to manufacture parts, and at the show announced it was upgrading its piston and turbine helicopter models. In its booth, it featured the first aircraft to roll off its new production line, a turbine Enstrom 480B.

Enstrom also unveiled new glass cockpits and plans to produce up to three aircraft a month by the end of the year. "We are ramping up in a measured manner right now," Enstrom President Todd Tetzlaff said at a press conference during the show.

### Celebrating Achievement

In addition to the busy show floor, HAI HELI-EXPO 2023 offered attendees opportunities to network, learn, and celebrate the industry. The Georgia Aquarium provided a

dramatic backdrop for Monday evening's welcome reception, while Tuesday's ribbon-cutting ceremony to open the show floor included a gospel choir singing their powerful rendition of "Celebration."

Two professional development events with a networking focus included the Mil2Civ Workshop for veterans transitioning from military service, followed by an industry career fair on Tuesday. Wednesday's agenda included the always-popular Meet the Regulators session, providing attendees the opportunity to speak with FAA representatives, and a panel discussion and networking event for women in aviation businesses.

Education and professional development are always a focus for HAI HELI-EXPO attendees, and this year was no exception. Nearly 2,200 attendees took advantage of an impressive slate of in-depth Professional Education Courses, one-hour Rotor Safety Challenge sessions, and Manufacturer Technical Briefings, many of which were eligible for FAA WINGS, AMT, and inspection authorization renewal credits. HAI awarded about 1,000 credits during the show.

HAI maintained the focus on education by putting safety

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# Supply Chain Woes and Creative Solutions

WITH PENT-UP DEMAND CAUSING an increase in orders, almost every vertical aviation OEM acknowledges that one key issue—the supply chain—is affecting delivery. Experiences differ, but the outcome is the same, as these HAI HELI-EXPO exhibitors explain.

“What’s holding us back is the availability of critical parts due to suppliers having difficulty purchasing raw materials,” says Leon Silva, vice president of global commercial and military systems at Sikorsky, a Lockheed Martin company. “Ukraine and Russia are both large suppliers of titanium, for example. So we’re seeing extended lead times for parts.”

Nicolas Chabée, vice president of helicopter engines marketing and sales at Pratt & Whitney Canada, adds that the foundries used to cast parts have limited availability. “We are above our targets in all platforms ..., but we are competing with all manufacturing for casting,” Chabée says.

Chabée also notes that, in the past, demand in the helicopter industry sales cycle typically alternated between the commercial sector and the military/paramilitary sector. Increased tensions in Europe and a recovering commercial market mean demand is strong in both sectors, further increasing the need for engines.

Leonardo reports an excellent year with increased commercial sales and boosted military sales in part due to replacing grounded Russian Mi-8 helicopters. What’s more, Bell’s US Army future long-range assault aircraft (FLRAA) win in December for the V-280 tiltrotor provides validation for Leonardo’s investment in the civilian AW609.

But for Leonardo, getting parts and materials remains challenging and runs deeper than the supply-chain issue. “We have to be very careful with inflation, the supply chain, and the financial crisis, both with the war and international trade crisis,” says Roberto Garavaglia, senior vice president of strategy and innovation. “We aerospace and defense industries need to critically review our supply-chain sources and find new sources. We also need to attract new, young talent to STEM careers, as that is another shortage.”

OEMs are attacking supply-chain difficulties in a variety of ways.

Rolls-Royce is in a slightly better position than other companies, ironically because of a difficult situation before the pandemic, when it was experiencing massive turbine-wheel

backlog and materials shortages. During the pandemic and the resulting economic downturn, the engine manufacturer entered into favorable long-term purchase agreements for materials. As a result, it is now receiving its raw materials at significantly lower, locked-in rates.

“Our engines are built from ... 40% [parts] made in-house,” explains Scott Cunningham, Rolls-Royce program director for helicopters. “We are in a strong position on the make side with raw materials.”

Robinson Helicopter Company is similarly limited by vendors’ abilities to deliver. Sales are back to prepandemic levels but could be even higher.

“Our biggest problem is we have too big of a backlog,” says President Kurt Robinson. The company is running two shifts with more than 1,030 employees and plans to hire another 70. The holdup now is outsourced parts and supply.

To free up space and labor at the factory, Robinson is outsourcing overhauls, work it traditionally performed in-house, to Robinson service centers wherever possible.

Bell is experiencing its own pressures. In addition to work related to its new FLRAA contract, the production line for all aircraft is almost sold out for 2023. What’s more, many of Bell’s suppliers support military contracts, which always take priority over commercial customers.

“When we have delays in getting parts, we have to be creative,” says Bell Director of Commercial Programs Michael Nault, although he notes that the workaround can create inefficiencies. “We skip the part installation and keep the aircraft moving down the line, coming back to add parts later as they come in.”

Airbus Helicopters has seen a 15% increase in helicopter sales over last year, but supply-chain concerns will cap how quickly the company can deliver, Airbus Helicopters President Romain Trapp told ROTOR.

With Airbus having both helicopter and commercial airplane divisions, “the demands on materials and parts manufacturing from the commercial airline industry are quite visible to Airbus Helicopters,” Trapp says.

To tackle the supply-chain issue, Airbus invested \$150 million in parts inventory worldwide to anticipate customer need. The company also strengthened its ability to provide customer support by increasing that staff by 34%.





## HAI HELI-EXPO 2023: A CELEBRATION OF INDUSTRY GROWTH *continued*

literally in the center of the show floor, with the popular HAI Rotor Safety Zone sharing space with the HAI Connect stage. Virtual-reality simulators offered attendees an opportunity to test their safety skills and learn about the value of simulators in training and maintaining currency. Representatives from a variety of safety organizations were available to discuss how attendees could implement best practices to improve their safety performance. Multiple sessions of HAI's new Heli-Expert safety trivia game (with prizes for winners) challenged attendees willing to put their knowledge on the line. Another highlight in the Zone: the US Coast Guard's newest variant, an Airbus MH-65E Dolphin multi-mission helicopter from USCG Aviation Training Center in Mobile, Alabama.

For small-business owners, HAI staff reprised their popular Communications University sessions offering tips and techniques that operators can use to promote their businesses on social media and when hosting a visit from a member of Congress. Other Comms U sessions covered crisis communications and digital marketing.

Earlier in 2023, HAI had announced its Salute to Excellence winners. These vertical aviation professionals from all areas of the industry, nominated by their peers and chosen for outstanding achievement, were presented with their awards at a reception on Monday evening.

The show floor also featured a display of the winning photographs from ROTOR magazine's annual photo contest. The contest invites entries in five categories, each representing an aspect of the helicopter industry, and receives submissions from hundreds of photographers around the world. In addition to the five category winners, ROTOR magazine also selects a grand prize winner. The winning photographs were also featured in the March 2023 issue of ROTOR.

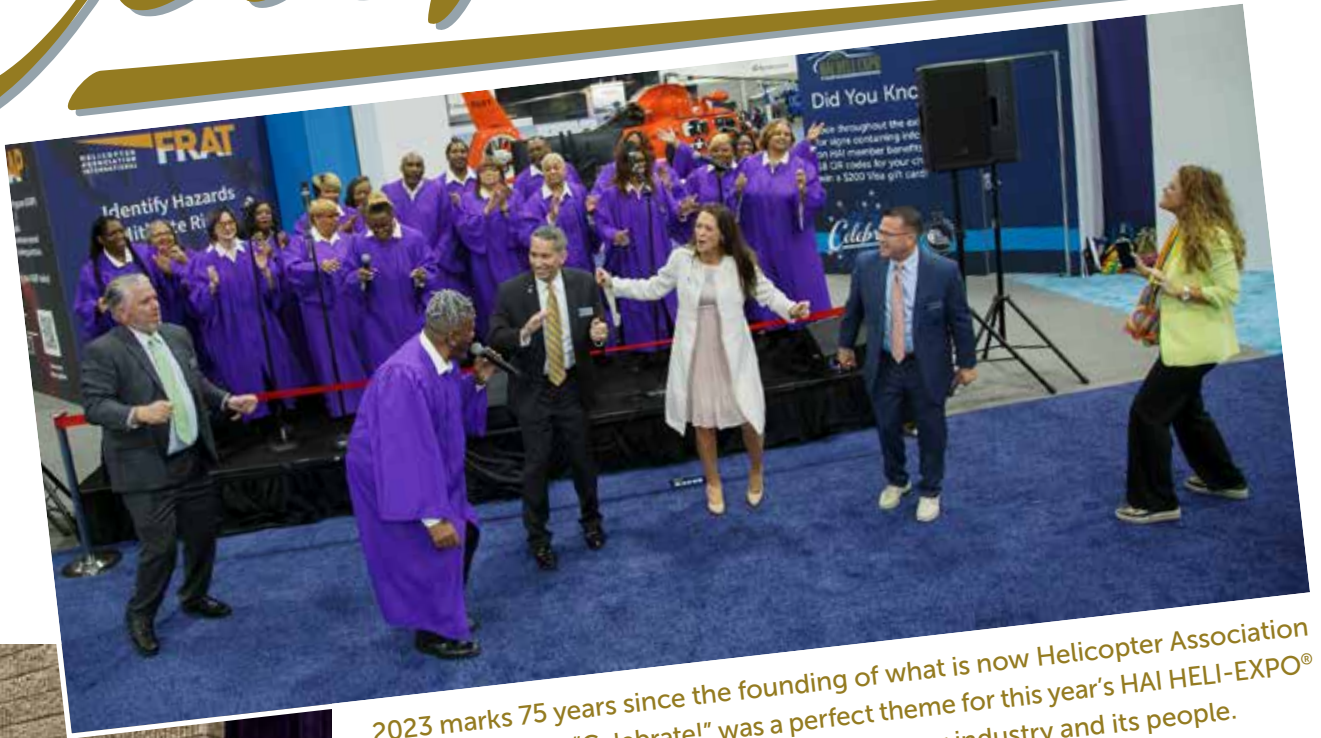
### **A Year to Celebrate**

On Dec. 13, 2023, HAI will observe its 75th anniversary. This year's Expo kicked off a yearlong celebration of the association's service to members and the greater vertical aviation industry that will culminate at HAI HELI-EXPO 2024 in Anaheim, California, Feb. 26–29. The theme: Building Tomorrow. Learn more at [heliexpo.com](https://heliexpo.com) and mark your calendars!

"When I talked with exhibitors, they said pretty much from Day 1 they've been steady with appointments and walk-ins, and that's everyone from the big manufacturers to the smaller businesses that are the backbone of our industry," says Viola. "More companies brought extra staff to meet with potential customers, and they were hitting their ROI [return on investment] right out of the gate." 

With 49 aircraft and the latest technology on display, there was plenty to smile about on the HAI HELI-EXPO 2023 show floor. (HAI/f-stop Photography)

# Celebrate!



2023 marks 75 years since the founding of what is now Helicopter Association International, so "Celebrate!" was a perfect theme for this year's HAI HELI-EXPO® trade show, conference, and celebration of our industry and its people.  
*(All photos by HAI/f-stop Photography)*



Above: Members of the HAI Board of Directors joined the Voice of Atlanta choir to celebrate the opening of the HAI HELI-EXPO 2023 show floor.

Left: Twenty-nine companies welcomed hundreds of HAI HELI-EXPO attendees to the HAI Helicopter Industry Career Fair to talk about employment opportunities in vertical aviation.

Right: This underwater egress training, conducted by HAI member Survival Systems USA, was just one of the 143 education sessions and courses offered at HAI HELI-EXPO 2023.







Above: Bell Flight sponsored a discussion on “Embracing Equity” that featured women from across the industry speaking on the opportunities, and the challenges, for women in rotorcraft.

Right: Schools from the Atlanta area brought groups of students to the show, giving many their first exposure to the vertical aviation industry.

Below: As part of her Social Media 101 class, Jaasmin Foote, HAI social media manager, took HAI members onto the show floor to practice their skills.



Above: The Welcome Reception was held at the Georgia Aquarium, a short walk from the Expo venue. The scenery may not have included helicopters, but it was still eye-catching for attendees.

Below: HAI President and CEO James Viola, left, congratulated HAI Salute to Excellence awardee David Ellis, executive director of the Haiti Air Ambulance, a charity providing air medical services on the island. Ellis received the Golden Hour Award for his effective use of air medical helicopters to overcome Haiti’s land-transport challenges.





# Flight Control Reimagined



**WATCH  
HAI's  
James Viola,  
NTSB's Bruce  
Landsberg  
demo  
Skyryse  
FlightOS**

Skyryse's current goal is to see an R66 (left) equipped with an STC-approved FlightOS in daily commercial service by September 2024. (Robinson Helicopter Co. Photo)

With FlightOS, Skyryse CEO Mark Groden (right) is fulfilling a childhood dream of developing safer ways to travel. (Skyryse Photo)

## Skyryse technology aims to eliminate general aviation fatalities.

By James T. McKenna

**T**RAPPED IN THE BACK SEAT during repeated five-hour car trips across the American Midwest to visit family as a child, Mark Groden began to imagine better, safer ways to make the journey. Airlines weren't an option, since the 40-minute flight entailed a two-hour-plus drive each way. Private aircraft also were out: Groden's parents weren't pilots, and they lacked the means to stay current in an aircraft even if they had been.

Now, seven years after earning a doctorate in engineering from the University of Michigan, Groden is nearing fulfillment of his childhood dream. Skyryse (pronounced "SKY-rise"), the El Segundo, California-based company he founded in 2016, is working toward earning an FAA supplemental type certificate (STC) to install an automated flight control system on the Robinson R66. The company, which has partnered with Robinson on the project since 2020, says it aims to have an STC-equipped R66 flying in commercial service daily by about September 2024.

"A lot of people have realized that we have a transportation problem," Groden, Skyryse's CEO, told ROTOR at HAI HELI-EXPO 2023 this past March. "Many are trying to develop new aircraft types, electric vertical takeoff and landing [eVTOL] ones, and what have you. But to me, the problem always felt like it was more, How do you make existing pilots and existing aircraft more capable, safer, and have higher utility?"

### Fly by Wire for Any Aircraft

To reach that goal, Skyryse has developed a suite of technologies (or "technology stack") to replace a currently certificated aircraft's flight control system with a fly-by-wire, IFR-certificated operating system called FlightOS. Skyryse aims to have FlightOS certificated to 14 CFR Part 25

commercial airliner airworthiness standards, with a projected failure rate of  $10^{-9}$ , or 1 failure in 1 billion operations. (That's three orders of magnitude greater than the standard required of most certificated helicopters and general aviation airplanes.) The helicopter STC would also comply with Part 27 for normal category rotorcraft.

FlightOS is intended to be aircraft agnostic, capable of



being retrofitted or installed on a production line on any aircraft, Groden says. While the R66 STC is Skyryse's lead project, he says, the company has agreements to pursue such certifications with four other major aircraft manufacturers, which he declines to name. Robinsons are considered among the most challenging aircraft for an STC application from the standpoints of volume, weight, power, and flight-control responsiveness requirements.

The Skyryse design replaces the R66's cyclic, collective, and anti-torque pedals with triply redundant, dissimilar systems linked to actuators on the swashplate. The system incorporates redundant power supplies and is operated by the pilot through two touchscreen flight controls, which the company describes as "simple and intuitive," and a

joystick. The current screens are iPads.

Skyryse developed FlightOS to support safe, automated aircraft operations, and Groden says the system provides the functionality of a conventional, all-axis autopilot while controlling and managing every system in the aircraft. FlightOS includes flight envelope protection control, advanced navigation, and data analysis capabilities designed to assess and adjust to terrain, wind conditions, and other variables.

In designing the system, Groden says, the Skyryse team took a “first principles” approach, identifying the most fundamental elements a pilot would need to achieve situational awareness and safely fly an aircraft. “If you looked at a conventional cockpit for the first time, you’d say, ‘This doesn’t look like it’s designed around a human at all,’” he says.

“The real innovation [with FlightOS] is that we started with the human and worked backwards, getting our system to feel intuitive and natural,” Groden said during a late 2022 visit to Skyryse by HAI President and CEO James Viola and US National Transportation Safety Board (NTSB) Vice Chairman Bruce Landsberg.

Both [Viola and Landsberg had the opportunity to fly a FlightOS-equipped R44](#). While Viola has logged thousands of rotorcraft hours, Landsberg’s experience is in fixed-wing

aircraft. However, after a 15-minute training session on FlightOS, both pilots were able to take off, hover, fly, and land the Skyryse-equipped helicopter.

### Reducing the Pilot’s Burden

Besides interpreting sensory inputs from conventional cockpits, Groden says, pilots “have to memorize the entire pilot operating handbook [POH]” to deal with normal and emergency conditions. When you’re flying a helicopter, with one hand on the cyclic and the other on the collective, “you don’t have an extra limb to grab the POH and read it, so therefore you have to know everything by heart and know exactly what to do. An airplane isn’t much better,” with the proliferation of onboard systems.

Of the pilot dictum “aviate, navigate, communicate,” in that order, Groden says FlightOS is designed to let the pilot focus on the latter two steps.

“The pilot is still in control of the aircraft but shouldn’t have to, in today’s world, worry about keeping the helicopter in the sky,” he says. “Because we’re [aiming to be certificated to a failure rate of]  $10^{-9}$ , the system only has one mode of operation. It never lets go. It’s always in control and right there with you. That reduces the pilot’s burden of having to successfully aviate the platform.

“Our technology stack is much more than just a

Skyryse says FlightOS’s triple-redundant, all-axis, IFR system, installed in this R44 demonstrator, will free pilots to focus on higher-level decision-making. (Skyryse Photo)





During a visit to Skyryse in late 2022, HAI President and CEO James Viola flew the FlightOS demonstrator, testing the technology's ability to simplify piloting a helicopter. (Skyryse Photo)

conventional fly-by-wire system or an avionics suite," Groden adds. "The category a lot of folks put us in is 'simplified vehicle operations.'"

### Higher-Level Decision-Making

FlightOS is targeted to help eradicate the biggest killers in the helicopter industry and, more widely, general aviation: controlled flight into terrain (CFIT), unintended flight into instrument meteorological conditions (UIMC), and aircraft loss of control. "These are things that we nearly make an impossibility with our technology stack," Groden says.

After his experience flying the Skyryse helicopter, Viola was impressed, commenting that the fly-by-wire aircraft flew just like his own R44. He also saw FlightOS's potential to improve safety in general aviation.

"It's got a lot of capability," Viola says. "The NTSB recommends you fly IFR if you're carrying passengers. The ability this system brings to do that all the time is there, and it's there today."

Viola notes that the root of many of the vertical aviation industry's safety challenges lies in inadequate aeronautical decision-making (ADM). New, advanced capabilities in aircraft don't change the need for good decision-making in the air, but they may free pilots to focus on doing that.

Asked about the Skyryse system's impact on ADM, Groden says, "Right now, people are required to make the decisions at very high levels and very low levels. You're making a decision in real time, almost all the time, about keeping yourself safely inside the flight envelope. What we try to do is take the aviate part off the table so you can focus on the higher-level decision-making, where we think [the

pilot is] best leveraged to maximize the safety of the flight. You still have full authority. You still have full control over the aircraft, but you're not actively stick-and-rudder working to control the aircraft to keep it on a trajectory and keep it safely in the sky."

FlightOS is based not only on Skyryse's operational and flight test experience, but also on that of other companies. In its seven years, Skyryse's team has included transportation experts from Airbus, Boeing, Ford, General Atomics, JetBlue, Moog, SpaceX, Tesla, Uber, the US military, and the Amazon autonomous-vehicle subsidiary Zoox.

### Proof of Concept

Since its inception, Skyryse has been busy developing and testing the technology that it hopes will eliminate general aviation fatalities.

On Mar. 29, 2017, the company flew one of the first 55-lb.-plus uncrewed VTOL aircraft. The next year, Skyryse employed a Robinson R44 (fitted with enhanced vision using radar and a 360-degree camera system) in partnership with the City of Tracy, California, for that government's air ambulance service. In 2019, Skyryse operated a high-volume, full-service, multimodal, door-to-door Part 135 air taxi service in the Los Angeles area.

Groden says undertaking traditional helicopter operations was a key element of Skyryse's strategy. "We've taken the time and gone through the process of really understanding what the end users need in order to be successful," he says.

In 2020, the company signed with Robinson to demonstrate FlightOS on its aircraft. Robinson Helicopter President Kurt Robinson confirmed that his company has been

Skyryse has been flight-testing elements of the FlightOS system for seven years, including runs in this 2017 uncrewed testbed. (Skyryse Photo)



assisting Skyryse in developing an R66 automated flight control system. “We have been following their progress,” he says.

Also in 2020, Skyryse closed on \$205 million in series B funding, bringing the company’s total capital raised to more than \$260 million from investors that include ArrowMark Partners, Cantos, Eclipse Ventures, Fidelity Investments, Ford Motor Co. Chairman Bill Ford, Monashee Investment Management, Stanford University, and Venrock.

In April of last year, Air Methods invested \$5 million in Skyryse and committed to retrofit with FlightOS more than 400 single-engine helicopters and fixed-wing aircraft in its air ambulance fleet. Calling FlightOS “a transformational technology for the industry,” Air Methods Senior VP of Aviation Operations Leo Morrissette says deploying it on the company’s aircraft “will first and foremost improve safety, lower cockpit workload, and allow our fleet to fully maximize the potential of patient care in a wide range of aircraft models and types.”

The air ambulance operator plans to install FlightOS on its fleets of Airbus EC130 and AS350 helicopters as well as its Bell 407s and Pilatus single-engine turboprop PC-12s, removing all current avionics suites in the process.

“In seven years of flight testing that’s been nearly every single day, we’ve also been testing different ways to control the aircraft and engage the pilot to control the aircraft,” Groden says. “I think what sets us apart, in addition to a very pragmatic approach that’s well informed by our real-world experiences, is that we’ve actually been testing different pieces of this technology for a very long time and learning on a daily basis with that feedback loop.”

Skyryse has grown from around 30 employees at the

start of 2022 to nearly 100 by March 2023, and it’s recruiting engineers. In March, it opened its new headquarters in El Segundo.

This year is shaping up to be exceptional for Skyryse. The plan is to maintain throughout the year the momentum with which the company started 2023 and carry that into Anaheim, California, at HAI HELI-EXPO 2024 next year. Skyryse plans to unveil a prototype that’s more representative of its STC system, including aviation-grade touchscreens in place of the current iPads, at Los Angeles-area events in mid-November.

Achieving its goal of having a FlightOS-equipped R66 in daily commercial service by September 2024, of course, depends on Skyryse’s progress with FAA STC certification. The company said in February that a major system review with the FAA resulted in 100% approval of its proposed means of compliance for full installation.

Progress may hinge on decisions the Skyryse team made at the very start of FlightOS’s development, Groden says.

“The approach we took at the outset was to follow existing certification pathways and bases the FAA has created over the last 30 or 40 years in developing Part 25 fly-by-wire automation systems and flight-control stacks,” he says. “We decided we weren’t going to invest in or build into our product anything that doesn’t have a certification basis.”

After that, it was a matter of explaining that rationale to the FAA.

Groden adds that his company’s approach helped gain the agency’s buy-in.

“The FAA’s mandate is to keep people safe, in the sky and beneath it,” Groden adds. “That’s what we’re about as a company.”

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A man with short brown hair, wearing a light blue button-down shirt, is looking down at a white document he is holding. The background is a blurred office setting with a window and some greenery.

# THE Perils OF Employment Training Contracts

Employer-paid training  
can come with strings  
attached.

By Jol A. Silversmith

*[Editor's note: The author is a member of the law firm of KMA Zuckert LLC of Washington, D.C. The views expressed herein are solely those of the author, and the information provided is not, and is not intended to constitute, legal advice.]*

**I**T LOOKS LIKE A GOOD OPPORTUNITY. You'll gain hours and a new type rating. You've already checked Glassdoor and asked your contacts about the operator's reputation. There's just one issue. When the operator sends the paperwork, there's a reimbursement provision buried in the legalese: a requirement that you repay a significant amount of money if you leave the company within two years of coming on board. Should you still go ahead and take the job?

The answer, unfortunately, is: "It depends." Although such a provision may look unfair, a court may find that it and the contract are enforceable, meaning you would be legally required to repay the money.

This is especially true if the sum at least roughly

corresponds to the company's investment in your training. If the terms are disproportionate, there may be an argument that they are unenforceable, but you would still run the risk of being sued over the contract and, subsequently, the risk of a court finding the contract and its terms to be valid.

Of course, if the opportunity is good enough, you may feel the risk of having to reimburse the company is justified. Or you may believe, no matter what the challenges, that you will "tough it out" until the end of the contract.

Even though there are no easy answers, this article offers some background and guidance about reimbursement clauses in training contracts for aviation professionals. Although the examples I use involve pilots, the principles apply to other aviation professionals as well.



## Training Contracts More Common

For pilots, there's no question that training is expensive. Common estimates of the cost to obtain a commercial pilot license are \$80,000 to \$100,000. Pilots looking for a job with an operator likely already have a commercial license, if not an airline transport pilot (ATP) license, but they also can expect to need a new type rating. Typically, the operator will pay for the necessary type training, which can amount to \$10,000 or considerably more, depending on the aircraft (and the operator may also pay for other recurring requirements). Understandably, the company doesn't want to see that investment walk out the door to a competitor.

Pilot training contracts are not new but do appear to have become more common in the industry in recent years, possibly because pilots are in demand and thus more likely to switch jobs instead of working their way up a seniority ladder. Nor are such agreements unique to aviation. A 2020 survey by the Cornell Survey Research Institute found that nearly 10% of American workers were covered by a training repayment agreement.

The US Federal Trade Commission (FTC) recently expressed concern about the impact of restrictive employment agreements, including reimbursement conditions. Earlier this year, the FTC proposed prohibiting a number of anticompetitive practices in employee contracts, including repayment provisions that are not "reasonably related" to the underlying training costs. But there is no deadline for the FTC to actually adopt a new set of requirements, and it also is not clear what "reasonably related" would mean in practice. In this article, I'll be describing current employment contract law.

## Each Contract Is Unique

There's an old saying in aviation: "if you've seen one airport, you've seen one airport" (meaning, each is unique and must be individually understood). The same is true for contracts; you should carefully review each one on its own merits.

When considering the implications of a training contract, some of the important factors to check include:

- What is the required reimbursement? Is it a fixed amount, or can it increase, for example, if the operator provides additional pilot training at a later date?
- How long does the requirement remain in effect? Does the amount due remain the same, or does it decrease on a pro rata basis over time?

- Are there escape clauses in the agreement? For example, if a pilot is terminated or laid off by the operator, does the repayment obligation remain in effect?
- Does the contract address how disputes over the contract will be handled? For example, if the operator sues a pilot and wins, does the contract provide that the pilot pay the operator's legal fees?

Generally, it may be advisable to seek out an attorney who has experience with employment contracts before signing on the dotted line since some of these issues may not be straightforward, even to a legal professional. For example, since the terms of state contracts are typically governed by state, not federal law—and state laws can vary significantly—it may matter which state's law a contract specifies will govern its interpretation. The law specified

in the contract may not be the same as the state in which the pilot will be based or even the state in which the operator is headquartered.

A further issue that may justify seeking legal advice is exactly how a contract's reimbursement

clause is structured. Historically, the enforcement of a training contract typically has required an employer to go to court, where the employer might have an advantage over an employee but still would have to devote time, effort, and money to proving its case. But it is becoming increasingly common for training contracts to incorporate a promissory note—essentially a financial agreement between the operator and pilot, similar to a bank loan. This type of arrangement is much easier for the operator to enforce, making it much harder for the employee to avoid repaying the funds.

Another circumstance when it is advisable to seek expert assistance is when, after joining an operator, a pilot believes it necessary to resign—not because a better job has become available but because of circumstances such as unsafe working conditions or discrimination based on race, sex, or other protected characteristics. The law usually recognizes the concept of "constructive termination"—that is, when an employee is effectively forced to resign—and in these circumstances does not consider the resignation to be a breach of the employment contract. But it also is important to ensure that any decision to resign for those reasons is properly handled to best manage the reimbursement issue, among other matters.

One further question to consider—although unfortunately not easy to answer—is whether the operator may be a "paper tiger." Just because a contract states that the company *can*

**Pilot training contracts have become more common, possibly because pilots are in demand and thus more likely to switch jobs instead of working their way up a seniority ladder.**

recover training costs from departing pilots doesn't mean that it *will*. Enforcing a contract is not cost- or risk-free.

However, to collect monies that they believe are owed to them, employers have other options apart from litigation—such as sending the claim to a collection agency, which may affect a pilot's credit score, in addition to triggering calls and letters. Additionally, the Pilot Record Improvement Act of 1996 (PRIA) requires operators to respond to inquiries from new employers about a pilot's past performance. Operators have the option, however, of declining to provide any positive feedback that is not required by law—or even providing negative feedback (such as disciplinary records not related to aircraft operations) along with the legally required records.

### Training Contract Issues

Some cases involving training contracts have generated reported court decisions. (It's likely that many others have been filed but have ended with settlements or decisions that have not been widely distributed.) Below are a few recent examples that illustrate some of the complexities around the issue and the different possible outcomes.

- A pilot was hired by a charter operator, with a two-year obligation to reimburse it for his training costs. The pilot left the operator after two months, and the company did not sue until four years later. An Arizona court ruled that the delay exceeded the "statute of limitations"—essentially, the limited time in which the carrier was allowed to sue under the contract—and not only dismissed the case but awarded legal fees to the pilot.
- In contrast, the same charter operator sued another pilot who had departed after only two months. In this case, the pilot's defense was that he had been constructively

terminated because he had been required to fly an unair-worthy aircraft. But the court concluded that the pilot had failed to present sufficient evidence and therefore ruled that the operator could recover not only the training costs (\$40,000) but also legal fees from the pilot.

- A different operator sought reimbursement of training costs from a pilot who quit 18 months into a two-year obligation. A Florida court concluded that the operator was entitled to some but not all of its requested damages and awarded the company \$6,600 out of the \$20,400 requested. The court's reasons included that one of the pilot's certifications that resulted from the training was valid for only one year and the carrier had fully benefited from it. In addition, there was a \$2,000 offset due the pilot because the carrier had failed to fully pay him for flights. The court also concluded that the carrier was not entitled to legal fees because it had not prevailed on the majority of the issues.
- A new complaint was filed earlier this year on behalf of a Part 135 all-cargo carrier's pilots. The pilots' complaint states that they are required to repay between \$20,000 to \$30,000 if they leave the carrier's employ within 18 to 24 months. The complaint goes on to allege that the received training costs the carrier far less than that amount and that the training is moreover of limited practical value. The case alleges that the repayment obligations violate federal and state law. The carrier has not yet responded to the complaint.

The bottom line: a training contract should be considered the legal equivalent of inclement weather. It doesn't necessarily mean that you shouldn't proceed—but you need to understand the conditions and be prepared for what to do if things go wrong. 🌀

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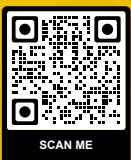


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## QUICK FACTS

### Terry Palmer

Airborne Public Safety Association  
Frederick, Maryland

## CURRENT JOB

I manage training programs for the Airborne Public Safety Association. I also chair HAI's Training Working Group, serve on the board of the Commission on Accreditation of Medical Transport Systems (CAMTS), write articles for trade publications, and speak at various aviation industry events.

## FIRST AVIATION JOB

I started taking flight lessons in the 1980s but couldn't find a stable flight school, so I sold the robotics company I owned and opened one. I was driven by the strong desire to be part of aviation.

## FAVORITE HELICOPTER

I don't think I have a favorite. They all play an important role in some operation, but I do fondly remember training in the Bell 206L-4 LongRanger and the BK 117.

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

Aviation captured my imagination when I was a small girl. I used to watch airplanes from my yard in Colonia, New Jersey. Some days we were under the flight path for landing at Newark Liberty International Airport (KEWR), 25 miles away.

I shocked my parents when I said, "When I grow up, I want to stop airplanes from crashing." I remember family members saying, "Girls don't do that." As a teen, I discovered the world of radio-control model aviation. I flew models and went to industry events, becoming a contest director for the Academy of Model Aeronautics. I didn't become a pilot until the late 1980s.

## How did you get to your current position?

My first career was building and operating robots and special effects. Some of my clients were Walt Disney, Universal Studios, Siemens, IBM, and Kraft. During my flight-school days, I managed to get my ratings and fly many types of aircraft. When I sold the school, I went to



Terry Palmer

work for Omniflight Helicopters, where I managed training programs, developed training material, and specialized in human factors and crew resource management (CRM). I traveled to air medical operations around the country and taught at various industry events.

I've been involved in safety and training most of my aviation career. Clark Kurschner, when he was Omniflight's director of operations, taught me the importance of human-factors/CRM training, and FlightSafety International taught me the value of scenario-based training in simulators to prevent accidents. I spent several decades working on



As chair of HAI's Training Working Group, Terry often works with HAI staff members (from left) Zac Noble, director of flight operations and maintenance; Greg Brown, director of education and training services; and Chris Hill, senior director of safety. (Terry Palmer Photo)

committees and attending safety meetings, often presenting human-factors training at the Airborne Law Enforcement Association's conferences. Now rebranded as the Airborne Public Safety Association (APSA), the organization provided me the opportunity to bring training resources to the public safety sector, which was the motivation for me to take my current position with APSA as its training program manager.

### What are your career goals?

In many ways, I have met and exceeded my career goals. My goal now is to continue to bring training and safety resources to aviation. I just want my tombstone to say "I made a difference."

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

Never give up. You can do anything you set your mind to. I didn't know where my career path would take me. I believe it's important not to focus on a narrow path, but to open your mind to all the career paths available and recognize that your vision and goals may change.

### Who inspires or has inspired you?

There are so many people and organizations that have inspired me that I couldn't possibly name them all.

HAI, the International Helicopter Safety Team, CAMTS [the Commission on Accreditation of Medical Transport Systems], and FlightSafety International inspired me to pursue a goal focused on safety and training. Robert Sumwalt, former chair of the NTSB [US National Transportation Safety Board], inspired me to continue to make a difference. Eileen Frazer, CAMTS's executive director, taught me the value of accreditation. Larry Mattiello [director of aviation at The Loomis Co.] showed me how the insurance industry can support training. Dennis Pierce, pilot and founder of Colorado Heli-Ops, inspired me to work with flight schools to mentor students and help them define a career path. John Frasca, CEO of Frasca

International, showed me that the simulator providers can develop resources for the small operator. The most inspiring was my late husband, Juan Serrato. He was a helicopter pilot in Vietnam and spent his career flying in many types of operations. He was a wealth of knowledge and encouraged me every day to continue to search for solutions to challenges.

### What still excites you about helicopter aviation?


What excites me most about helicopter aviation are the people who will continue to make the industry safer. The volunteers who serve on industry committees and working groups are a good example. They develop resources and identify solutions that improve both operations and safety. I'm encouraged that industry associations and their staff place a high priority on training and provide training resources and events. The aircraft and technology

manufacturers, as well, have embraced training and simulation.

### What challenges you about helicopter aviation?

There are still accidents that could be prevented. Training to proficiency and understanding the importance of preflight planning to include good decisions are critical to preventing accidents. The shortage of pilots, mechanics, and instructors is also critical. It directly affects both operations and training.

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

... I started to see the significant changes in the industry that embraced training. When I started my aviation career, there were only a few helicopter simulators. Now, the use of technology in training including simulation, spatial disorientation, and Web-based resources is standard. 



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# Komal Rahane, Helicopter Student, Veracity Aviation

*A personal loss inspires a dream of becoming an air ambulance pilot.*

**I**N 2007 IN INDIA, KOMAL RAHANE'S grandfather died of a heart attack after an ambulance arrived too late to provide paramedic care. Today, about to obtain her commercial helicopter pilot license (CHPL), Rahane has her grandfather in mind as she pursues her dream of becoming a helicopter air ambulance (HAA) pilot.

"Every time I take off" during training flights, Rahane says, "I wish the helicopter could have landed on our farm in India to save my grandpa."

## A Career Change Leads to Aviation

In 2015, Rahane left her homeland and moved to Texas to pursue a computer science degree. Two years later, she found herself working as a software developer. But she realized a desk job wasn't for her. "That wasn't making me happy," Rahane explains. "I was spending 10 hours a day sitting in front of a computer. It wasn't my personality."

She recalls that after moving to the United States, she saw an abundance of helicopters in the air and was especially inspired by air ambulance rotorcraft. "I never saw a helicopter closely when I was growing up," Rahane says. "In India, it's really rare to have a passion for being a helicopter pilot, because you don't see helicopters landing and taking off."

But seeing helicopters flying in Texas made her realize that "flying a helicopter is my thing."

Rahane began her pilot training in 2019 at Veracity Aviation, a helicopter pilot training school and operator in Pearland, Texas. But before she could feel comfortable in the cockpit, Rahane realized she had to overcome a physical challenge that she had encountered in the Robinson R22, the aircraft in which she started at Veracity.

"Aviation and cockpit controls were new to me," says Rahane. "The most challenging situation in the cockpit was not [being able to pull] enough power to climb and cross-check on instruments. A Robinson R22 gives a lot of vibration through cyclic control. My forearm and wrist weren't strong enough for that."

But Rahane didn't let those temporary limitations stop her. Following a suggestion from her flight instructor, she started going to the gym and lifting weights. "Before going to flight training, I started doing push-ups to gain more strength. I stayed committed and overcame my challenges."

Rahane received her private pilot certificate in 2021 and is now continuing her training toward her CHPL. She'd also like to obtain CFI and CFII ratings and hopes to become a flight instructor within a year, on her way to becoming an HAA pilot.



## HAI Scholarship Opens Doors

Rahane will be able to obtain her CHPL thanks in part to HAI, from which she received the HAI Commercial Helicopter Pilot Rating Scholarship in 2022 after learning about the association through a Google search. The scholarship included a cash award of \$5,000 toward the cost of obtaining the rating.

The funds are helping Rahane overcome a major impediment to her dreams.

“Financing helicopter training is the biggest obstacle,” she says, echoing the sentiments of many aviation students. “The HAI scholarship is giving me an opportunity to focus on my flight training and achieve my target.”

Rahane says winning the HAI scholarship means a lot to her and shows there are people in the industry who believe in her and support her dreams. “[Winning the scholarship] boosts my confidence and inspires me to wake up every day and work



As an HAI scholarship winner, Rahane received complimentary admission to HAI HELI-EXPO 2023, where she had the opportunity to meet HAI President and CEO James Viola and learn more about the vertical aviation industry. (HAI/f-stop Photography)

on my goal [of obtaining a CHPL],” a goal that was just 15 flight hours away as of this writing in May 2023.

Rahane hopes to be an example for other young women thinking of becoming helicopter pilots. “If society starts seeing more women helicopter pilots, more girls

will get inspired,” she explains. “This is a mindset shift for parents. ‘If someone else’s daughter can become a helicopter pilot, my daughter can also do it,’ they’ll think. That will be the biggest achievement I could do in my life. I want to be a trail-blazer.” [R](#)



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required, however, doesn't mean that following the guidance of the people who designed, built, and probably know the aircraft better than anyone else isn't a very, very good idea.

## The Flight

On the afternoon of Feb. 15, 2021, three passengers boarded a Bell 206B-3 for a planned 17-minute sight-seeing flight around St. Thomas, the most populous of the US Virgin Islands. The weather was fine, with clear skies and 12-kt. easterly winds.

A witness in his front yard said he saw the helicopter fly over his house and continue out over the ocean; as the aircraft made a 180-degree turn back toward shore, he began recording video of the flight with his mobile



phone. After about six seconds, the recording captured a puff of dark smoke from the engine bay that quickly dispersed in the rotor wash. The ship suddenly yawed left and then right before descending in a right turn toward a wooded hillside and out of the witness's sight.

### The Aircraft

The helicopter's engine was the original unit installed when the aircraft was manufactured in 1981. At the time of the accident, it had logged 11,519 hours in service. Between December 2008 and January 2009, at an engine total time (ETT) of 8,488 hours, the compressor section was removed for inspection and overhaul; a new stage 1 and the stages 2 and 3 compressor wheels were installed, while the remaining stages' original wheels remained installed.

The helicopter was brought to St. Thomas on Nov. 26, 2019, and although the US National Transportation Safety Board (NTSB) didn't report the airframe and engine times as of that date, two 100-hour inspections were performed later, the first on Mar. 1, 2020, at 11,406 hours ETT, and the second on Jan. 25, 2021, at 11,504 hours ETT.

In a commercial service letter (CSL), the engine manufacturer recommends giving engines subjected to saltwater exposure a compressor rinse after the last flight of the day, spraying fresh water into the compressor inlet while turning the engine over with the starter motor.

The helicopter's logbook had record of 13 such compressor rinses during the 74 hours of operation between Jul. 20, 2020, and Jan. 13, 2021.

An earlier CSL, first issued in 1991 and most recently revised in 2007, calls for adding inspection of the case, blades, and vanes to the 300-hour inspection checklist



The main wreckage of the St. Thomas accident. (NTSB Photo)

for aircraft "operating in a corrosive and/or erosive environment." This CSL also sets a calendar time limit of 6 months for non-coated compressor wheels and 12 months for coated wheels such as those on the accident helicopter.

The most recent 300-hour inspection documented in the logbook was signed off on Feb. 16, 2017, at an ETT of 10,960 hours—four years and 559 hours earlier than the accident date.

The aircraft records also included a 300-hour inspection checklist from Jan. 11, 2018, that cited 11,197 hours of engine operation, but no corresponding entry was made in either the engine logbook or the airframe logbook. If that inspection in fact took place, the subsequent 300-hour engine inspection would still have been more than two years and 22 flight hours overdue.

An undated engine inspection checklist, possibly from the aircraft's 2020 100-hour inspection, showed no initials or other markings in the 300-hour section. And in the records from the helicopter's last 100-hour inspection, in 2021, the 300-hour section of the engine checklist was crossed out and marked "NA."

### The Investigation

NTSB analysis of the recorded cell-phone video concluded the helicopter's ground speed was "about 39 kt." before the smoke appeared, then decreased to "about 30" before increasing to "about 68 kt." in descent. The high resolution and rapid capture rate (equivalent to 60 frames per second) of the mobile phone's camera also enabled analysts to calculate the main-rotor speed, which decayed from 390 rpm (99% of nominal speed) to just 74 rpm (19%) in the last second of the recording. The helicopter's rate of descent was estimated to have reached around 4,800 ft. per minute by the time the aircraft left the camera's field of view.

The wreckage was found on a steep, heavily forested hillside. None of the four occupants survived. The post-impact fire consumed almost the entire fuselage; two sections of the tail boom were found separated from the main wreckage. Both

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main-rotor blades remained attached to their hub, and while the fire had consumed the main-rotor gearbox housing, the gear train remained intact.

The manufacturer conducted an extensive examination of the engine core, which survived the fire. The first- and second-stage compressor blades were largely undamaged and showed no evidence of damage from foreign object debris (FOD). Two blades of the third-stage compressor wheel had fractured near their roots and weren't located; the remaining third-stage compressor blades were damaged primarily along their trailing edges.

The fourth-, fifth-, and sixth-stage compressor blades were all missing, fractured at their roots. Fragments of some axial compressor blades were found in the axial compressor section and the impeller inducer, and "the impeller inducer exhibited evidence of hard body debris ingestion."

The roots of the missing stage 3 compressor blades "exhibited signatures consistent with fatigue." The fractures began near the pressure side of the blades' trailing edges, but impact damage made it impossible to determine how the fatigue originated. Not surprisingly, the NTSB found the accident's probable cause to be "a total loss of engine power due to fatigue failure of two of the stage 3 compressor blades." But what caused the fatigue, and how did it escape detection?

The teardown inspection found "generalized corrosion ... on the inner and outer diameters of the compressor wheels for stages 2-3 and stages 4 and 5, but no pitting corrosion." Generalized corrosion was also present on both the inner and outer diameters of the stage 6 compressor wheel, and the fracture surfaces of all but one of the stage 6 blades showed "signatures of fatigue with multiple origins near the suction-side crown root."

Sixteen of the stage 3 stator vanes in the compressor case were missing, along with all the stator vanes from stages 4-6. The remaining stage 3 vanes were flattened, and all surviving vanes, including the undamaged vanes in the first two stages, had generalized corrosion.

### The Takeaway

The NTSB's finding of probable cause states that "contributing to the failure of the compressor blades was the failure of maintenance personnel to inspect the compressor at the recommended interval for operation in




corrosive environments."

Not reported is whether this lapse represented a conscious decision or a lack of information. Providers of services in tourist areas often operate on thin margins; the combination of the added maintenance expense and aircraft downtime might have seemed prohibitive, at least during prime visitor season.

One can imagine the operator deciding to at least postpone the inspection until bookings slowed enough to accommodate the inevitable pause between flights. Without knowing the background of the technicians who worked on the aircraft or the completeness of the paperwork that arrived with it, however, one can't exclude the possibility that they simply weren't aware of the CSL.

Maintaining airworthiness requires researching all relevant airworthiness directives (ADs) and confirming or attaining compliance, but CSLs, service bulletins, and the like aren't subject to the same mandate as ADs. While obtaining all the manufacturer's advisories might seem like cheap insurance, in a busy, understaffed shop it could also be seen as a distraction from more urgent tasks.

Whatever the reason, not performing the 300-hour engine inspection proved to be a very costly false economy. The fact that one wasn't technically required didn't make skipping it a good idea. 

The engine compressor following the accident (above). Thermal damage to the compressor case halves (below) prevented the investigative team from determining whether the stage 3 and 6 blades might have rubbed against the case and its plastic coating, which could have initiated the fatigue fractures, the NTSB noted in its report. (NTSB Photos)

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## The Last Line of Defense

*High-impact windscreens give pilots better protection in mitigating bird strikes.*



This Bell JetRanger (right), operated by Memphis (Tennessee) Police Air Support, lost nearly its entire windshield after the aircraft hit a duck (opposite) in flight. Amazingly, the bird, a lesser scaup, survived. (*Memphis Police Air Support Photos*)



SEE  
Bell test its  
HIWs



SEE  
Robinson test  
its HIWs

OVER THE PAST FEW YEARS, the number of reported aircraft bird strikes has increased notably, according to the [FAA Wildlife Strike Database](#). Even when we use long-known bird-strike mitigation strategies such as reducing airspeed, flying higher, and using specialized lighting, our avian friends continue to defy our best efforts.

Thankfully, most of these impacts involve small birds and are minor, resulting in no or minimal damage to the aircraft; impacts with large species, however, have the potential to disable the pilot, crew, and the helicopter itself. This possibility effectively leaves our last line of defense, the thin plastic windshield—which adeptly keeps us sheltered from the elements (and bugs out of our teeth)—vulnerable to penetration.

It may come as a surprise to many readers that the

only US regulations pertaining to impact tolerances for bird strikes in rotorcraft are found in 14 CFR Part 29, which covers transport helicopters, and include both the windshield and critical flight structures. For normal category rotorcraft, specifically Part 27 helicopters, such regulations are impractical due to structure, performance, and center of gravity concerns. However, the existing Part 29 regulations provide a good target for two industry-leading aircraft manufacturers who've taken it upon themselves to provide safe, high-impact windshield (HIW) options for customers.

I recently corresponded via email with Kurt Robinson, president and chairman of Robinson Helicopter Co., and Bill Sumner, senior manager of engineering at Bell Helicopter, about their HIW products and their companies' efforts to increase rotorcraft safety.

### Why did you invest in research and development of high-impact windscreens even though it's not required?

**Kurt Robinson:** Robinson continuously reviews the accident reports on our helicopters, particularly those involving fatalities or serious injury. We noted the number of accidents involving bird strikes and wanted to see if there was anything we could do to minimize or reduce these types of accidents.

**Bill Sumner:** Bell developed the first crash-resistant fuel cells for commercial helicopters in the late '70s, and we implemented that safety feature across our entire production line 15 years before the FAA developed a regulation requiring it. We've worked on impact-resistant windscreens for years.

### With no basic standards in place, how did you decide what degree of protection to adopt, and roughly how long was your development process from product conception to completion?

**Robinson:** We looked to Part 29 and wanted to get as close as we could to meeting those requirements. Although we've thought about this issue for many years, once we came up with a concept we thought would work, it took us about four years to get the windows developed and approved.

**Sumner:** For our tests, we use the Part 29 requirements for impact from a 2.2 lb. bird at  $V_{NE}$  [never-exceed speed]. Birds vary in size and speed, but this test has been used as the "standard" for many years. We know it provides protection in real life.

### How did you overcome weight and center of gravity (CG) issues?

**Robinson:** Weight and CG are always part of [our] design criteria. We're proud of the fact that, at 1.0 to 1.3 lb., the high-impact windshields are only slightly heavier than the standard windshields.

**Sumner:** Weight and CG were both



very significant issues, as it's essential to have sufficient structure to retain the windscreen during an impact event.

Bell's work on impact-resistant windscreens goes back many years, and based on that experience, we developed a patented approach to the windscreen-retention issue that reduces the need for additional structure.

### Is your HIW for new helicopters only, or can it be retrofitted onto older ones as well?

**Robinson:** At the moment, our windows are available on new aircraft and aircraft returned to the factory for overhaul. Due to the structural cabin requirements, we don't offer a field kit.

**Sumner:** All our designs can be retrofitted to older aircraft. They're designed and certified as replacement windshields.

### How have HIWs been received by your customers?

**Robinson:** The optional high-impact windows have been very popular, particularly for those operating in regions where birds are a factor.

**Sumner:** They're very popular and becoming more so. The additional cost varies between types, but it's significant. ... It's worth it.

### Do you offer high-impact windscreens on any of your current models or plan to offer them on any models in the near future?

**Robinson:** HIW is offered as an option on all our models.

**Sumner:** We currently offer impact-resistant windscreens on the Bell 206, 407, 412, and 429. We plan to offer them on other models as well, perhaps including other manufacturers' models. [R](#)

## Come Home Safely after Every Flight

Developing or purchasing high-impact windscreens, just as for any other occupant-protection equipment, can be an expensive endeavor. Yet operators hopefully can quickly offset such costs by reducing the severity of—or preventing—tragic crashes and expensive repairs.

HIWs may also help reduce operator insurance premiums, so if you're considering purchasing them, a quick discussion with a broker may help guide you in the decision-making process.

Opting for HIWs might not be the right financial choice for everyone. But remember, birds can appear anywhere at any time, especially for those flying in known problem areas or on high at-risk missions such as air ambulance flights.

Even when we make the most diligent plans and follow established mitigation techniques to the highest possible level, birds—and quite possibly drones—may still find their way into our personal space (helmets on and visors down at all times!). Selecting a high-impact windscreen and other occupant-protection equipment will give pilots, crews, and passengers that last line of defense that allows us to come home safely after every flight.

# Paying It Forward

*In mentoring the next generation of mechanics, we honor the privilege of maintaining aircraft.*



The author watches as Zach Brown, a new A&P mechanic, conducts an engine inspection. (HAI/Greg Brown)

**O**NE WEEKEND THIS PAST MAY, I had the privilege of working on my friend Greg's aircraft, a beautiful Beech Debonair. Greg's son Zach, a recent airframe and powerplant (A&P) school graduate with an A&P mechanic certificate, was with us. Another new aviation maintenance technician entering the workforce!

## Hangar as Refuge

Like Zach, I enjoy working on aircraft and turning wrenches. A nice toolbox and a clean, dry hangar with some tunes playing in the background is the perfect therapeutic escape from whatever's dragging me down. My fellow mechanics will know what I'm talking about. Even pilots enjoy the sanctuary of their hangars, because they often end up doing more hangar flying than real flying. There's just one difference: as a sign on my hangar wall says, "If you ain't bleedin', you ain't mechanic'in'."

Seems like I'm always gouging myself with safety wire or pinching a finger. It's part of the challenge of

working on aircraft. Engineers put the parts you have to reach the most in the smallest, most inaccessible location possible because they don't like mechanics ... at least it seems that way. You can bet your next favorite beverage that if the aircraft has a 25-hour inspection criterion, there won't be an access panel and you'll have to be trained by the Houdini school of contortion to get your hands where they need to be!

So with the hangar door open, the sun shining, a few airport hang-arounds hangin' around doing what they do best—marvel at what mechanics do—Zach and I jacked up the Debbie and performed a landing gear inspection, including an operational check with a manual gear extension. After that, we flushed and serviced the landing gear struts and then asked Greg to run the aircraft for a few minutes, check some indications in the cockpit, and heat up the engine for us so we could continue our maintenance.

We did engine compression checks followed by a borescope inspection of all the cylinders and valves. At that point, I was comfortable speaking the phrase all

owners of piston-powered aircraft desperately want to hear, “It’s all good with acceptable compressions, and the bore-scope inspection is good as well.”

Normally at that point, the owner will stop pacing the floor and stop thinking he’ll have to sell a body part to support his flying addiction.

### Experience as Teacher

Zach hadn’t done this type of maintenance outside the school environment. Could he have done it without me? Possibly. But, for sure, it benefited him to have me there to coach him through the work. What we mechanics and pilots bring to the table is experience. Experience in doing a task our students haven’t done before.

I heard many years ago when I was a US Army pilot: the basic flight instructor is the pilot in command, not the unit instructor pilot. That’s a true statement. As they progress in their careers, mechanics and pilots will absorb the most lessons not from their instructors but from the people around them every day—their fellow line mechanics and line pilots.

It is such an aviation tenet that we shall mentor those starting out in the field that the FAA has memorialized it in a rule. I remember when I took the oral and practical exam for the A&P certificate some years ago, the designated maintenance examiner (DME) took his time after I passed to ensure that I understood 14 CFR 65.81 (a)(b), “General Privileges and Limitations.”

Specifically, part (a) of the rule states that “[a certificated mechanic] may not supervise the maintenance, preventive maintenance, or alteration of, or approve and return to service, any aircraft or appliance, or part thereof, for which he is rated unless he has satisfactorily performed the work concerned at an earlier date.” The point of the rule is to make sure new mechanics are supervised by experienced mechanics who’ve already demonstrated they know how to perform the task at hand.

It’s been my privilege to work on aircraft. Consider how few have earned the right to do so.

It’s also my honor to have motivated Zach, to have taught him how to jack an aircraft, do a landing gear swing, run engine compression tests, and perform a bore-scope inspection. (Wait—he left the hangar without bleeding. I must have missed a step!)

Zach will soon be off to begin his new career as an A&P mechanic, having already secured a position with a prominent aircraft operator.

Now, he can supervise a new mechanic on the tasks I helped him with because he meets CFR 65.81, having “satisfactorily performed the work concerned at an earlier date.”

*Fugere tutum!* 🇺🇸



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