

BUSINESS AVIATION



INSIDER

THE OFFICIAL MAGAZINE OF NBAA

JULY/AUGUST 2022



ELECTRIC FUTURE

PG 16 Alternative propulsion systems are coming

TECHNOLOGY ISSUE

OUT OF SIGHT

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Supply chain, labor challenges persist
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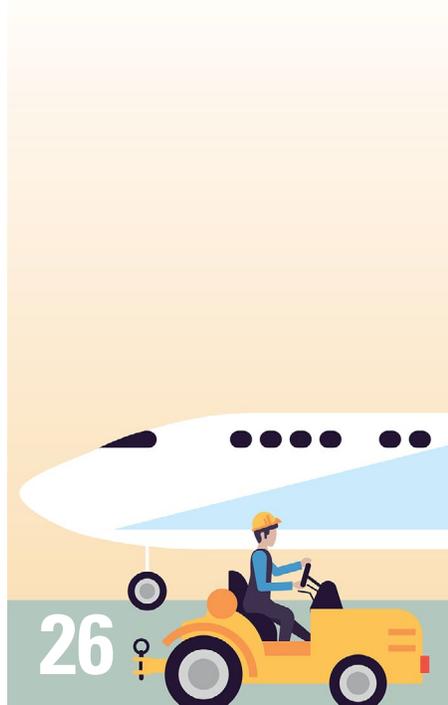
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Embracing Innovation and New Technology



ED BOLEN
President and CEO

Right before our eyes, the pace of innovation in business aviation is transforming our industry. Established companies and start-ups alike are moving forward aggressively

on new fuels, propulsion systems, on-demand transport vehicles and other technologies that point to a future of flight that is more safe, secure and sustainable than ever.

As an association dedicated to fostering business aviation in the U.S. and around the world, the promotion of new technologies is among NBAA's top priorities.

Take, for example, our work to promote a new generation of electrically powered advanced air mobility (AAM) vehicles, which have the potential to dramatically increase the efficiency of on-demand aviation for companies and entrepreneurs. NBAA's AAM Roundtable and the association's Emerging Technologies Committee continually work with legislators and regulators to create a policy framework for the safe integration of AAM into the nation's aviation system.

NBAA's work to advance game-changing innovations also takes shape through collaboration with other industry organizations. We're part of the Business Aviation Coalition for Sustainable Fuel, a collection of associations focused on increasing the production and use of sustainable aviation fuels (SAF). These safe, ready-to-use fuels can reduce aircraft carbon emissions by as much as 80% compared to traditional fuel, making them a cornerstone technology in the industry's aim of achieving net-zero carbon emissions by 2050.

As an association dedicated to fostering business aviation in the U.S. and around the world, the promotion of new technologies is among NBAA's top priorities.

Our work in these and other areas is producing demonstrable results, including the introduction of federal policies to encourage adoption of these new technologies.

For example, legislation has been introduced in the House and Senate to authorize funding to build AAM infrastructure and foster community engagement programs to introduce these next-generation vehicles to a diverse set of communities. Similarly, the House and Senate have introduced bills containing a blender's tax credit to help accelerate the production of SAF to our stated goal of 35 billion gallons by 2050.

This edition of Business Aviation Insider, NBAA's flagship magazine, provides details about the latest major aviation technologies, including not just AAM and SAF, but innovations in electric and hybrid propulsion, unmanned aircraft systems and more.

Innovation has always been a hallmark of business aviation. As a variety of exciting technologies are coming online faster than ever, NBAA will continue leading the way in helping to make them a reality, which portends a bright future for business aviation. ✨

NBAA PRESIDENT AND CEO
Ed Bolen

SENIOR VICE PRESIDENT, COMMUNICATIONS
Dan Hubbard

MANAGING EDITOR
Robert A. Searles
202-737-4483, bsearles@nbaa.org

SENIOR GRAPHIC DESIGNER
Collin King

DESIGN AND PRODUCTION
Yes& Agency

ADVERTISING AND SPONSORSHIP SALES
Amanda Dumont
864-373-1168, adumont@idc.nbaa.org
Carly Heideger
410-584-1973, carly.heideger@wearemci.com

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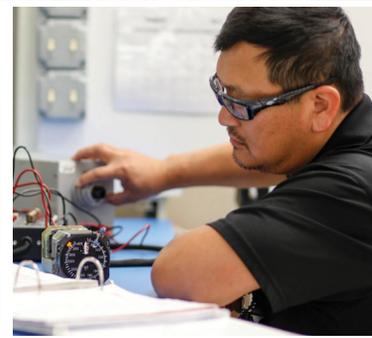
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FLIGHT BAG



NBAA AIRCRAFT EXPORT GUIDE

This members-only resource was updated recently to provide an introduction to the latest rules that relate to exporting aircraft from the United States.

nbaa.org/export

PHOTO © JAN POLLERS PHOTOGRAPHY



Resources: Technology

Here are some of the resources NBAA offers to help members stay abreast of new developments and safely apply them to their businesses.

SUSTAINABLE AVIATION FUELS

Learn about sustainable aviation fuels, which are designed to be efficient, “drop-in” renewable source alternatives to petroleum-based Jet A.

nbaa.org/saf

ADVANCED AIR MOBILITY

Read the latest about how electric vertical takeoff and landing (eVTOL) aircraft will move people and cargo between places not currently or easily served by surface transportation or existing aviation modes. nbaa.org/aam

UNMANNED AIRCRAFT SYSTEMS

Unmanned aircraft systems have many applications in business aviation. Read the latest on UAS technology, safety and integration into the National Airspace System. nbaa.org/uas

EMERGING TECHNOLOGIES COMMITTEE

This group provides insights that enable NBAA to advocate on behalf of industry on rulemaking, standards setting and policy-related activities related to a variety of new aviation technologies.

nbaa.org/emerging-tech

COMMUNICATIONS, NAVIGATION & SURVEILLANCE

As new technologies have been developed, operators have made the investments needed to incorporate new equipment into their aircraft. Learn about technologies such as ADS-B, RVSM, TCAS, CVRs, FDRs and PBN. nbaa.org/cns

COMMERCIAL SPACE

It is critical that NBAA and its members engage new industry segments such as commercial space to ensure safe integration with existing flight operations, while encouraging innovation and new technology. nbaa.org/space

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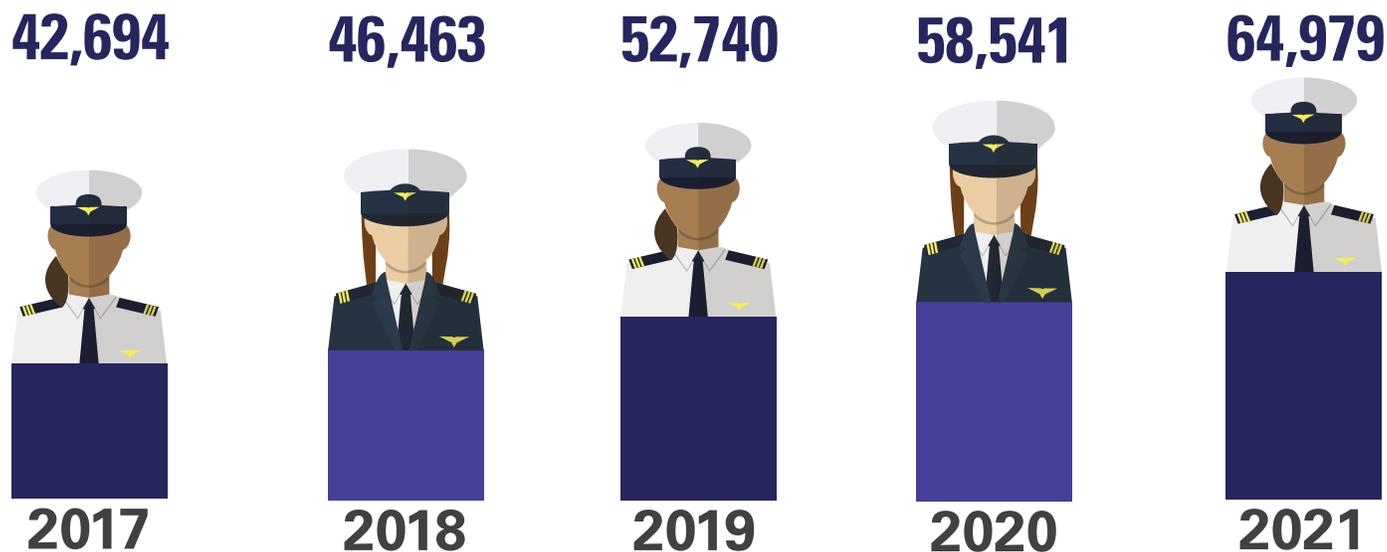
11%

the projected annual growth rate for aircraft and avionics technician jobs through 2030

Source: U.S. Bureau of Labor Statistics Job Outlook, 2020-30

By the Numbers: Number of Women Pilots Growing

Everyone knows that there's a shortage of qualified business aviation personnel, but there is some good news: the number of women pilots is increasing, according to recent FAA estimates. Besides a positive increase over each of the past five years, the number of women aviators increased nearly 11% between 2020 and 2021.



SOURCE: FAA

DEDICATED TO HELPING BUSINESS ACHIEVE ITS HIGHEST GOALS.



HELP NBAA CELEBRATE 75 YEARS



#NBAA75

2022 marks NBAA's 75th anniversary as the leading advocate for business aviation. Since its founding in 1947, the association has worked to foster an environment where business aviation can thrive through frontline advocacy, up-to-the minute information and expert resources to keep members informed and prepared for issues that impact their operations.

Today, we've grown into a community of more than 11,000 business aviation professionals and on this milestone anniversary, we want to hear from YOU!

What impact has NBAA had on you and your business or flight operation?
How would you like to see NBAA mark its 75th anniversary at NBAA-BACE?

Submit your stories,
ideas here.





REP. JAY OBERNOLTE (R-8-CA), a business owner, serves on the committees on Natural Resources, Budget, and Science, Space, and Technology and is the freshman class representative to the House Republican Policy Committee. Among his priorities are a commitment to tackle major issues such as technology policy reform. Previously, Rep. Obernolte served as a member of the California State Legislature and as Mayor of the City of Big Bear Lake. In addition to owning a video game development studio, Rep. Obernolte is a certified flight instructor. He holds a B.S. in Engineering and Applied Science from the California Institute of Technology, an M.S. in Artificial Intelligence from UCLA, and a Doctorate in Public Administration from California Baptist University.

On Twitter
@JayObernolte

New Caucus Championing Advanced Air Mobility

Rep. Jay Obernolte and Rep. Jimmy Panetta are the co-chairs of the new Advanced Air Mobility (AAM) Caucus in the House of Representatives.

Q: What are the goals of the Advanced Air Mobility Caucus?

Obernolte: AAM is poised to revolutionize the way people and cargo move within and between communities, complementing existing transportation networks and helping to contribute to a sustainable future for aviation. Imagine a future where, instead of summoning an Uber or Lyft, you walk several blocks to a nearby vertiport where an aerial vehicle picks you up and takes you straight to your destination at a cost similar to using a ridesharing app today. This future is only possible if the federal government provides a regulatory structure that can enable these innovations without stifling them. The goal of the Advanced Air Mobility Caucus is to educate members of Congress about the possibilities of this technology and to promote bipartisan conversations about the regulatory structure necessary for this new industry to thrive.

Panetta: Ultimately, we're looking to promote the U.S. as the global leader of AAM. To get there, the caucus will educate members of Congress and their staff about the benefits of AAM and the reality of what is coming in the next few years. We want members to realize that the federal government has a role to play in fostering innovative, clean flight alternatives. The caucus will seek to support the air mobility industry in partnering with industry and federal regulators, as well as working to tear down barriers that prevent the industry from getting off the ground. We'll also explore other applications for AAM besides commercial travel and cargo transport,

"It is critical that the private sector and the federal government work together to create an environment where consumer safety is protected while permitting the AAM industry to grow and thrive."

REP. JAY OBERNOLTE, AAM CAUCUS CO-CHAIR

such as emergency response or national defense applications.

Q: Why are government-industry partnerships important to the successful implementation of AAM?

Obernolte: Government often struggles to gracefully handle disruptive industries. New technologies such as AAM bring new challenges and hurdles in federal regulation, and it is critical that the private sector and the federal government work together to create an environment where consumer safety is protected while permitting the AAM industry to grow and thrive.

In its oversight role, Congress has a vested interest in ensuring the federal bureaucracy is engaged and effectively coordinating internally during the development and implementation of AAM. Fostering and maintaining government-industry partnerships will help develop a framework that ensures the government does not get in the way of AAM, as it sometimes has in the past with other innovative industries.



REP. JIMMY PANETTA (D-20-CA), who was first elected to Congress in 2016, is serving his third term in the House. He currently serves on the Ways and Means, Agriculture and Armed Services Committees. He also serves as a Chief Deputy Whip for the Democratic majority and on the House Democratic Steering and Policy Committee. Prior to coming to Congress, Panetta served as a deputy district attorney for Monterey County. In 2007, Panetta volunteered for active duty, was deployed to Afghanistan in support of Operation Enduring Freedom and earned a Bronze Star. Growing up in Monterey County, he graduated from the University of California at Davis with a degree in International Relations and earned his law degree from Santa Clara University.

On Twitter
@RepJimmyPanetta

Panetta: Government and industry working together is critical in any emerging industry, including AAM. For example, in 2012 NASA started to work with Joby Aviation, an AAM innovator in my district, to prove that electric flight was possible. Over the years, the government has continued to be involved, primarily with NASA research and FAA flight certification. At the Congressional level, we've worked to introduce and pass legislation like the Advanced Aviation Infrastructure Modernization Act, which will provide states and localities grants to proactively plan for AAM. The government also has a role to play in messaging its intentions to have the U.S. lead the world in the development of this technology.

Q: What can we do to ensure AAM will compete globally, and what should the FAA's role be?

Obernolte: One of the biggest barriers to this emerging technology is the need to develop industry standards for certifying and approving AAM aircraft, pilots and operations. The FAA has a unique opportunity to take a leadership role in the creation of an international certification and regulation framework for these aircraft. The FAA has a long-standing practice of working with other nations' aviation agencies to create bilateral aviation safety agreements, which provide for transnational cooperation in a variety of aviation domains. Foreign aviation agencies have often deferred to the FAA's standards in the past, and we believe that if the FAA seizes this opportunity, we can help drive these new international standards.

Panetta: Currently, there is a real global race for leadership in this space. AAM is projected to be a \$1 trillion industry by 2040, and the countries that put in place the right regulatory and policy framework will reap these benefits. The FAA will need to provide companies the regulatory certainty necessary to get through certification and into commercial operations. We want the

"AAM is projected to be a \$1 trillion industry by 2040, and the countries that put in place the right regulatory and policy framework will reap these benefits."

REP. JIMMY PANETTA, AAM CAUCUS CO-CHAIR

FAA to be a standards-setter for the world, and we need a national AAM strategy. If we can do that, we'll beat other countries to market and be able to scale faster. We'll also be able to build up an AAM industrial base so that civilian and military customers don't source from outside the U.S., which could create security risks. A robust base will also allow us to export our capabilities in a smart, secure way.

Q: How will the advancement of AAM benefit the aviation industry's sustainability and workforce initiatives?

Obernolte: AAM has the potential to help us create a sustainable aviation future. America is the most innovative country in the world, and when we allow American innovation to thrive, it opens new possibilities to grow our economy, expand jobs and export new technologies to the world, all while making our earth cleaner.

Panetta: AAM will be the first opportunity to deliver true zero emissions flight and create a new form of quiet, accessible and sustainable aviation. Aviation only makes up 9% of the total U.S. transportation emissions, but it is one of the hardest sectors to decarbonize. To meet industry's goals of net-zero emissions by 2050, electric aviation will be a critical element. In addition, AAM is projected to add nearly 300,000 jobs by 2035. ✨

REGIONAL REPRESENTATION

Quarterly Meetings Bolster Dialog Between NBAA, Regional Groups

The NBAA Local and Regional Group Committee recently launched the first of what will be a series of quarterly meetings with state-level and regional business aviation associations aimed at strengthening communications between NBAA and local groups.

"It's vital that our respective associations speak with a singular voice on national issues, as we've seen recently with matters like ATC privatization," said Steve Hadley, NBAA's senior director of regional programs and Southwest regional representative.

"At the same time, NBAA wants to be able to support these groups in whatever way we can regarding the issues that matter most in their regions," added Hadley.

Held May 25, the first of the quarterly meetings with the local and regional groups focused primarily on highlighting resources available from NBAA to support these organizations as the business aviation community emerges from the COVID-19 pandemic, noted NBAA Local and Regional Group Committee chair Kyle Eiserer, owner of Airside FBO.

"The past couple of years have certainly been challenging to navigate," said Eiserer. "Some groups remained active [during the pandemic], but others are just now coming out of hibernation, in a sense. It's really important for them to have the latest information and resources available. It's also beneficial for those groups to see how other local and regional associations were able to maintain activities and enthusiasm during this time."

Workforce development is another important topic for discussion at these quarterly meetings, and Eiserer noted

"It's vital that our respective associations speak with a singular voice on national issues, as we've seen recently with matters like ATC privatization."

STEVE HADLEY

Senior Director of Regional Programs, NBAA

that regional groups can offer new ideas and perspectives to help inform NBAA's efforts to develop and grow future business aviation leaders.

"Getting out in front of up-and-coming generations is so important," he said. "While NBAA's work has focused primarily on near-term candidates in high school and college, some of the regional groups have launched programs to introduce students even at the elementary school level to potential opportunities in aviation.

"Our overriding goal is to provide resources and share best practices with all of the various groups," declared Eiserer.

"These meetings help ensure that the communication channels between local groups and NBAA remain open and accessible, so that we're able to coordinate our efforts in the most beneficial and productive manner," he concluded. ❖

Review NBAA's regional group resources at nbaa.org/regional.



IBAA SUPPORTS BUSINESS AVIATION IN THE HAWKEYE STATE

The Iowa Business Aviation Association (IBAA) provides educational and networking opportunities for industry stakeholders and business aviation advocates in the Hawkeye State.

Despite challenges from COVID-19 (the pandemic began just months after the group formed), IBAA has grown to 65 members, which include flight departments, FBOs, flight schools, airports and individuals.

"Many of our members were grounded in the initial weeks of the pandemic, which gave them time to focus their energy on really establishing our organization," said IBAA President Matt Wolford, who also is vice president at Jet Air. "Now that everyone's busy again, the question becomes, 'How do we keep this going?'"

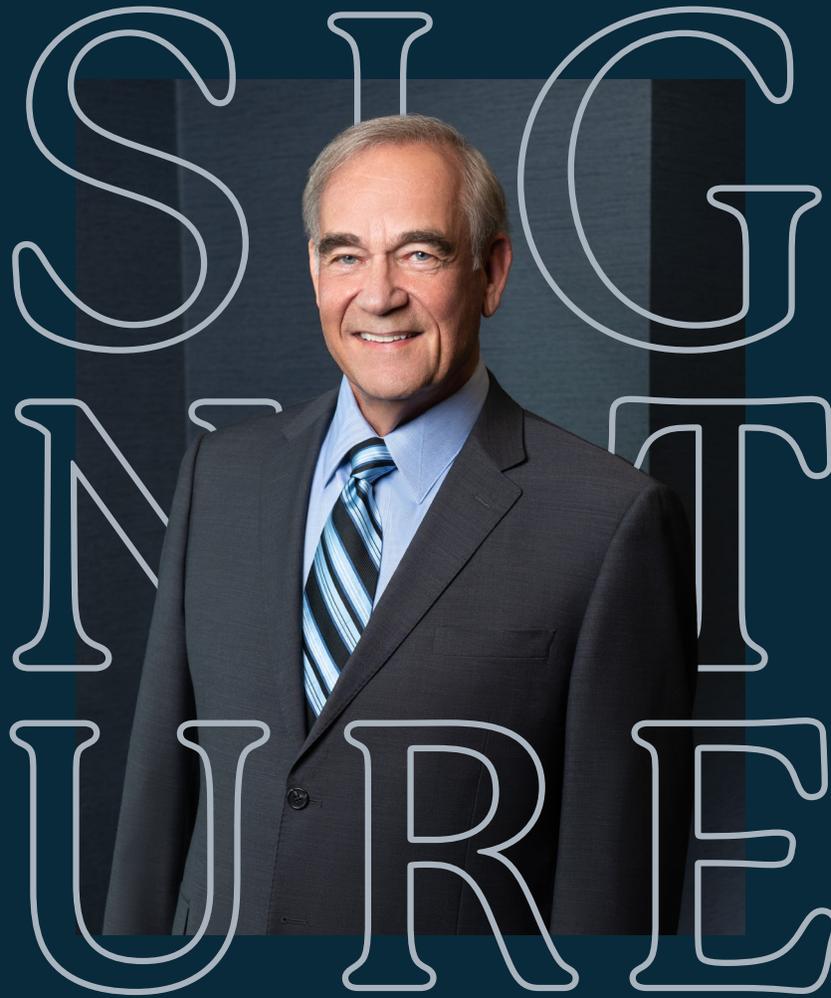
To that end, the group holds quarterly meetings that feature presenters from service providers, the FAA and other stakeholders, covering a variety of educational and operational topics.

Workforce development is another focus for IBAA, which launched its first scholarship program last year.

"We awarded two \$1,000 scholarships," said IBAA Vice President Ian Lumpp, who also is director of business development at Flying Media Group. "We're looking to sponsor a group of students to attend NBAA-BACE later this year so they can experience the show. It's important to give back where we can."

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INTRODUCING
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Roger Clark brings a high degree of patience and insight to aviation law cases that are emotionally charged and legally complex. Mr. Clark joins Signature Resolution with a vision to establish a national aviation practice in the field of mediation.

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INDUSTRY CHALLENGE

New passenger-entry requirements to the EU require a lengthy registration process more geared to airlines than to business aviation.

NBAA RESPONSE

NBAA and EBAA are working with European officials to guide EU entry policies and procedures that are more practical for business aviation.

New EU Passenger Entry Requirements Coming Soon

New passenger-entry requirements are coming for flights into the European Union (EU). All carriers flying into the EU must register for two programs: Entry/Exit System (EES) and European Travel Information and Authorization System (ETIAS), which go into effect in September 2022 and May 2023, respectively. EES is similar to the U.S. visa program, and ETIAS is like the Electronic System for Travel Authorization, or visa waiver program.

These new EU entry requirements apply to Part 125, 135 and certain Part 91 operations, but do not apply to individuals who own and pilot their own aircraft into the EU or operate under NCC/NCO (noncommercial) rules, even if they use professional paid crew members.

“These programs will more efficiently administer the EU’s visa and visa waiver programs,” said Johan Glantz, senior manager of safety and regulatory affairs at the European Business Aviation Association.

Experts recommend that operators register as soon as possible to avoid delays, since the agency that administers the new entry programs – the European Union Agency for the Operational Management of Large-Scale IT Systems in the Area of Freedom, Security and Justice (eu-LISA) – says that registration will take a few months, not days or weeks.

“If you are a Part 135 operator in the U.S. and you don’t normally fly to Europe, you will have to plan ahead,” said Glantz. “This registration will not be quick.”

However, carriers not intending to fly in the next 12 months to the 26 European nations that are included in the Schengen Area should not register for these programs. In fact, the new rules prohibit an operator from registering without a known trip in the Schengen Area within the next year, limiting on-demand and short-notice trips.

“All business aircraft operators should stay tuned for more information on EES and ETIAS, as requirements and methods of compliance are very fluid at this time.”

BRIAN KOESTER

CAM, Director of Flight Operations and Regulations, NBAA

The registration process is somewhat airline-centric, requesting names of handling agents at each “station” and establishing and testing dedicated connections at each station. This requirement is impractical for most business aircraft operations.

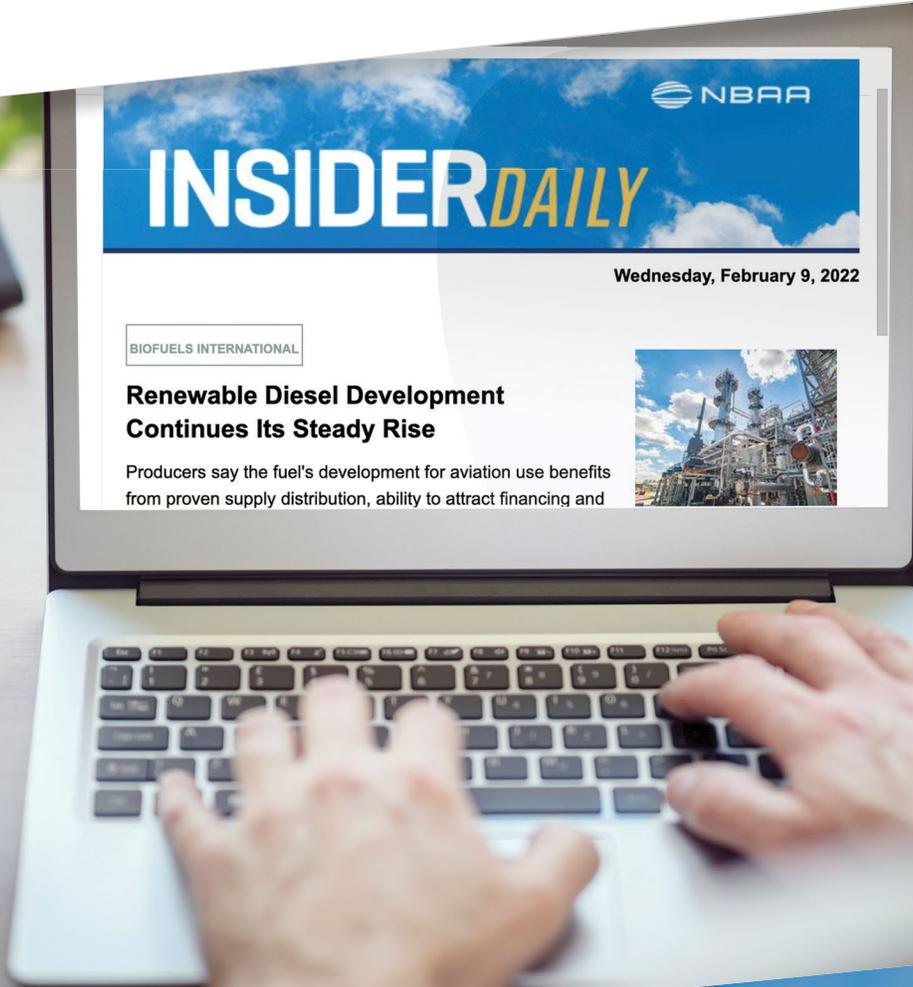
“The F01 Carrier Registration Form can look intimidating to complete, as it asks for all official information of the aircraft operator and requires supporting documents identifying the official capacity of the aircraft operation,” said Michael Ouellette, senior director of global operations at World Fuel Services.

However, experts say that eu-LISA is likely to eventually offer a mobile app that will enable operators to scan a passport and receive verification of a passenger’s status.

Nevertheless, “all business aircraft operators should stay tuned for more information on EES and ETIAS, as requirements and methods of compliance are very fluid at this time,” said Brian Koester, CAM, NBAA’s director of flight operations and regulations. ❖

Review the details of the regs at nbaa.org/eu-entry.

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NBAA INSIDER DAILY

Weekday-morning email news service

NBAA has introduced a weekday-morning email news service – NBAA Insider Daily – to bring members the latest original content and thought leadership from the association, as well as career opportunities and aviation news from trusted sources around the web.

nbaa.org/news/nbaa-insider-daily

PRO TIPS



STEPHANIE CIFUENTES



JULIA HARRINGTON



TRESSA MATTINGLY

Young Professionals: Building Your Brand

Building and maintaining a professional brand is essential for young professionals (YoPros) who work in or want to enter business aviation. But how do you accomplish that, given endless social media notifications, educational commitments, family obligations and more? It's simpler than you think, and the following tips can help take your brand to the next level.

"First, you have to find your voice and what you're passionate about," said Stephanie Cifuentes, a first-generation Bolivian-American mom of two, MBA candidate and senior specialist of ambient marketing base business at Nestlé. "It can start with your job, your home life and go from there. For me, it's advocating for working parents and career progression for diverse talent."

Cifuentes added, "Taking on speaking engagements is another way to build your brand; I've spoken with students about choosing majors and internships. Always take the opportunity to speak about what you know."

"Your brand is not just on social media, but also who you are when you're not posting."

TRESSA MATTINGLY
Social Media Manager, NBAA

NBAA Social Media Manager Tressa Mattingly, mom to two young children, has worked to amplify her brand as a social media expert in the aviation industry.

"I've worked in communications and social media for the last 12 years and have developed a specialty as an expert in transportation," she said. "I will often write blog posts and share them on LinkedIn or volunteer to speak at social media conferences and offer training sessions for people who want to learn more about using social media for professional purposes."

As you develop your brand and build your community and networks, Mattingly said it's important to maintain your integrity, both on and off line. "Your brand is not just on social media, but also who you are when you're not posting."

Julia Harrington, lead captain and PWK base manager for Axis Jet and an NBAA Top 40 Under 40, emphasized the importance of an online presence.

"In the age of social media, everyone has a personal brand. It's up to you to take charge of it and curate a positive brand that represents your values. Companies will search you on social media, so make sure what they find accurately depicts what you want to present. Especially in business aviation, being intentional with your brand can be very beneficial to opening doors to new jobs, internships and networking opportunities."

Sharing your essential values does pose some risk, however.

"Never be afraid to speak a truth that's unpopular," said Cifuentes, but be prepared for responses from people who may disagree with you. "Always have a backup plan, and think strategically for success." ❖

Review NBAA's resources for young professionals at nbaa.org/yopro.

DEDICATED TO HELPING BUSINESS ACHIEVE ITS HIGHEST GOALS.



MENTORING NETWORK

MENTORING NETWORK

Mentoring the next generation of business aviation professionals has never been more rewarding, and easy. Through NBAA, we will connect you with potential mentees seeking guidance from experienced professionals, and let your journey of inspiration begin. You have the option to match up based on location, industry objectives and other factors to provide an engaging and fulfilling experience for both of you.

2022-23 NBAA Mentoring Network registration window will close on September 15.

mentoring.nbaa.org



ADVANCING TOWARD AN

ELECTRIFIED FUTURE

HUNDREDS OF COMPANIES ARE WORKING ON THE
TECHNOLOGIES THAT WILL ENABLE GREENER FLYING.



“WE’VE SEEN A TREMENDOUS AMOUNT OF INVESTMENT IN THESE [ADVANCE AIR MOBILITY] COMPANIES, AND WHILE THAT DOESN’T MEAN ALL WILL BE SUCCESSFUL, IT IS A DIFFERENTIATOR OVER THE PREVIOUS GENERATION OF ADVANCEMENTS.”

PARIMAL KOPARDEKAR
DIRECTOR, NASA AERONAUTICS RESEARCH INSTITUTE

Few other industries spur the kind of excitement about the latest and greatest advances just around the corner than aviation, so it’s understandable if some view the rosy predictions regarding electric aircraft, advanced air mobility (AAM) and other near-future technologies with some degree of skepticism.

That said, there’s a sense of momentum and purpose that differentiates today’s environment from that of 15-20 years ago, when some forecasters predicted that very light jets would darken the skies.

By one estimate, more than 400 companies are currently involved in some aspect of AAM, from developing electric vertical takeoff and landing (eVTOL) vehicles and the innovative propulsion systems that will power the next generation of aircraft, to laying the groundwork for the infrastructure necessary to support AAM operations. Government agencies, including the FAA and NASA, are working to safely integrate these new-generation aircraft into the national airspace system.

While some attrition will inevitably occur in the number of entities working on AAM, innovative concepts are driving progress toward making these dynamic concepts a reality.

“In addition to significant forces like technological progress and the drive toward sustainability, there’s a non-technical ‘third dimension’ at work,” noted Parimal “PK” Kopardekar, director of NASA’s Aeronautics Research Institute (NARI). “We’ve seen a tremendous amount of investment in these companies, and while that doesn’t mean all will be successful, it is a differentiator over the previous generation of advancements that were largely driven by a small number of entrepreneurs, private equity firms or OEMs.”

“The last five years has been a really interesting period for the sector, and I think the next five years will be equally exciting,” agreed James McMicking, vice president of strategy for ZeroAvia. “We’ve seen electrification open up new ideas around how we can use the sky, and we’ve also seen escalation in the urgency to mitigate aviation’s climate impact. We must think creatively about how to do that, and it’s good to challenge the process a bit to see how we can do that quicker.”

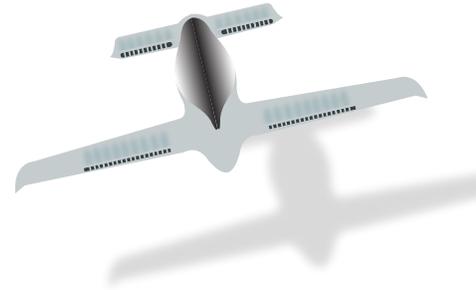
Matt Byrd, president and CEO of Hillwood, calls the current environment “an inflection point” for global aviation.

“The Wright Brothers changed our world with powered flight in 1903, and jet propulsion changed our world again in the 1950s,” explained Byrd. “And now, with electric, fly-by-wire flight control systems and advanced digital construction methods, we’re able to bring the air to the masses in an affordable rate that is highly innovative and that will help democratize air travel.”

While electric aircraft and AAM vehicles are not yet flying in commercial service, it may happen much sooner than some think.

“I wouldn’t be in my job if I thought we faced a 20-year lead time for this to take off,” said Taylor Alberstadt, global sales and marketing leader for unmanned aircraft systems (UAS) and unmanned air mobility (UAM) at Honeywell. “In five years, I believe there will be hundreds of vehicles operating in select cities globally, and I expect we’ll be able to take our first flights in AAM vehicles no later than 2027.”

Here’s a snapshot of just a small fraction of the development work being done today to make that happen.



ADVANCING TOWARD AN ELECTRIFIED FUTURE

SUPPORTING THE AAM OPERATING ENVIRONMENT

While eVTOL and AAM are relatively new concepts, NASA has worked extensively on the concept of aerial mobility and is applying lessons from current agency initiatives, including its Unmanned Aircraft System Traffic Management (UTM) project, to inform the process of integrating AAM into the national airspace system.

“You must look not just at the technology, but also readiness, acceptance by society, manufacturing and supply chain issues, and, of course, capital,” said Parimal “PK” Kopardekar, director of NASA’s Aeronautics Research Institute (NARI). Regulatory compliance, while outside NASA’s purview, will also influence how quickly AAM and electric aircraft gain a foothold in the industry.

“This is an entire ecosystem, with not only aircraft, but also infrastructure and community integration, that must all work together,” continued Kopardekar. “Enabling future air traffic management and airspace operations that harmoniously and peacefully coexist, without interfering with each other, requires a totally different, performance-based type of system.”

Lessons learned as NASA has leveraged existing resources to improve distribution of needed supplies will also influence this work. One example is a 2020 intern-led NASA initiative that matched suppliers with volunteer pilot organizations using general aviation aircraft to deliver 200,000 meals and cases of bottled water for distribution to families in need across Eastern Arizona and New Mexico’s Zuni Pueblo.

“It was fascinating to see how advanced air mobility could make such a difference,” Kopardekar said. “We are now able to envision a new and different type of aviation, unlike anything seen before.”



SEEKING AAM PROPULSION SOLUTIONS

Among the more vexing technological dilemmas facing AAM and other future aircraft designs is the matter of propulsion. Many innovators are trying to meet this challenge, and Honeywell Aerospace believes it may have a possible answer with the company's proposed hybrid-electric turbogenerator, which mates the company's HGT1700 auxiliary power unit (APU) to a one-megawatt generator.

With the APU already flying in Airbus A350 airliners, Honeywell recently announced completion of Phase 1 testing of the 280-pound generator, during which it was operated continuously at 900 kW, displaying a power density of approximately 8 kW per kg at approximately 97% efficiency, according to the company.

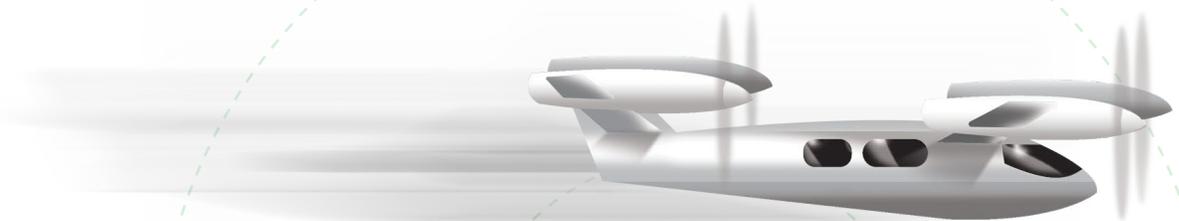
Taylor Alberstadt, global sales and marketing leader for unmanned aircraft systems (UAS) and unmanned air mobility (UAM) at Honeywell, said the company is looking at AAM applications across this emerging segment.

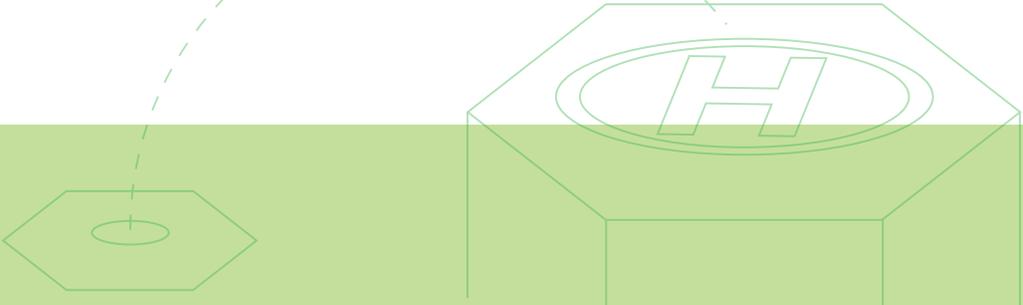
"It's fantastic to be able to say, 'here's a megawatt of electric power, what do you want to do with it?'" said Alberstadt. "Series hybrid? Drive a propulsor? Auxiliary power? Deicing? This solution opens possibilities not necessarily tied to any one system."

AAM remains a focus for the company. In December 2020, Honeywell announced a memorandum of understanding with British startup Faradair Aerospace to collaborate on using the turbogenerator unit to power its Bio Electric Hybrid Aircraft. "They were one of the first customers we engaged with for feedback from the market," Alberstadt noted.

From just a handful of employees a few years ago, Honeywell now has more than 50 people working specifically on AAM and UAS across the engineering, program management, marketing and sales divisions of the company.

"We're all-in on this technology," Alberstadt said. "Our focus is on technologies contributing to a more sustainable future and helping customers who are helping the world at large."





DEMONSTRATING CAPABILITIES AND DEVELOPING INFRASTRUCTURE

Backed by storied entrepreneur and aviator Ross Perot Jr., Hillwood is leveraging its 27,000-acre multi-modal “Mobility Innovation Zone” at Alliance Airport (FTW) in Fort Worth, TX, to help develop the infrastructure necessary to support AAM and other future aviation operations.

“Regional air mobility is where computing power meets avionics meets digital manufacturing,” said President and CEO Matt Byrd. “The technology is there, but we’ve got some work to do with [air traffic control], noise, community acceptance and infrastructure. But it’s hugely exciting and we’re [already] seeing it start to work.”

One example is Alphabet’s Wing program, in which UAS operated by the Google subsidiary deliver Walgreens pharmaceuticals to customers in the Dallas-Fort Worth metroplex. Hillwood is a supporting partner on that project, with UAS operating from its Frisco Station mixed-use development.

Byrd also points to Zipline, which is using UAS to deliver blood throughout Africa. “They’ve flown thousands of missions and haven’t crashed a single vehicle,” he noted, “and they’re saving lives in these remote areas where they don’t have the infrastructure. That helps with the acceptance.

“First, we do small cargo, then move into larger cargo vehicles,” he continued. “Then pilot passenger travel to existing airports and heliports, followed by investment in dedicated vertiports when the revenue stream makes sense.”

While cautious about expanding vertiports too quickly, “when customers realize how much they’ll love this service and are willing to pay for it, you will see vertiports spring up all around the world,” he predicted.

ADVANCING TOWARD AN
ELECTRIFIED
FUTURE

BRIDGING THE POWER GAP WITH HYDROGEN FUEL CELLS

Even as the aviation industry works toward full electrification, many early AAM vehicles and other sustainability-focused aircraft designs will rely on hybrid-electric propulsion systems that, at least in part, will continue to use petroleum-fueled powerplants. ZeroAvia is working on another option, by replacing conventional aircraft turbine engines with hydrogen-electric powertrains.

“If you want to pack a lot of energy, you need a very big battery, which means a lot of weight,” said James McMicking, the company’s vice president of strategy. “That makes it very difficult to design a viable aircraft with any meaningful payload and range. Fundamentally, you can move a very large amount of energy with hydrogen more easily than you can with the increasingly large batteries that would be needed for larger planes.”

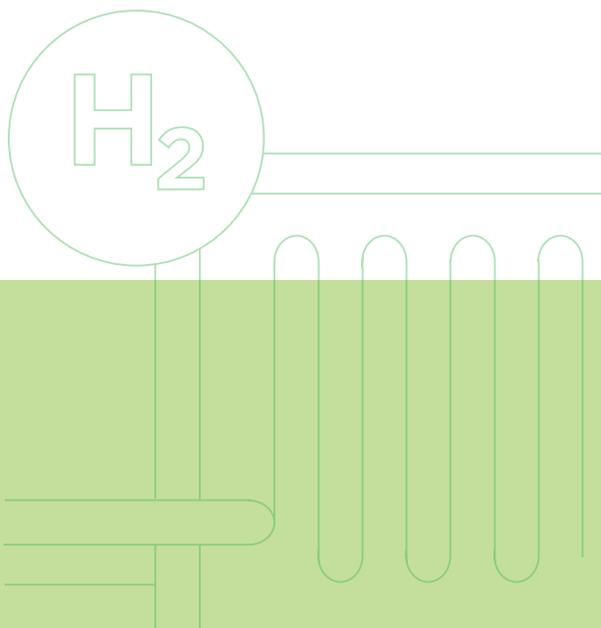
ZeroAvia is currently working on a 19-passenger Dornier 228 twin-engine regional turboprop testbed with one ZA600 hydrogen-electric powertrain paired with one of the aircraft’s existing Honeywell TPE331 turboprop engines. McMicking anticipates first flight this summer, with subsequent follow-ons incorporating full hydrogen-electric propulsion on 40- and 72-seat turboprops, and eventually even larger aircraft.

“The aim is to make a standard powerplant that can be fitted to a range of aircraft in the nine- to 19-seat category,” McMicking explained. The engine would be powered by gaseous hydrogen, with certification targeted in 2024. “We’re already laying many of the technology foundations for a two- to five-megawatt powerplant ... to have ready for service in 2027.”

In addition to working through the technical challenges of on-aircraft hydrogen power, ZeroAvia is also exploring the infrastructure needed to distribute both gaseous and liquid hydrogen at airports on a large scale. The company has demonstrated a mobile hydrogen refueling truck concept, with additional work being done on airside and landside pipeline systems.

“We have a few partnerships in this area, combining both on- and off-site production,” McMicking noted. “That learning process will continue into the future as we begin to see larger-scale projects that provide larger quantities of hydrogen. ❖”

Review NBAA’s advanced air mobility resources at nbaa.org/aam.





BEYOND

VISUAL LINE OF SIGHT

Unmanned Aviation's Crucial Next Step



IGHT

Beyond visual line of sight (BVLOS) operations are the next crucial step to ensuring an effective and successful unmanned aircraft system (UAS) industry, particularly commercial UAS operations.

Currently, most commercial UAS operations are conducted under 14 CFR Part 107, which outlines limitations to minimize air and ground risks. These limitations include a maximum altitude of 400 ft AGL, visual line of sight of the aircraft and daytime operations only. A recent rule allows limited operations over people, but many restrictions remain.

Some commercial UAS operations are considered air carrier operations and are conducted under Part 135, but extensive exemptions and limitations are typically required to conduct UAS operations under these rules.

“Existing rules basically don’t fit the requirements for full implementation of commercial UAS capabilities,” said Jon Damush, CEO of Iris Automation, Inc., a safety avionics technology company pioneering detect-and-avoid systems and aviation policy

“Existing rules basically don’t fit the requirements for full implementation of commercial UAS capabilities.”

JON DAMUSH
CEO, Iris Automation, Inc.

services that enable customers to build scalable BVLOS operations for commercial drones. “The current regulations still limit UAS use cases.”

Consider inspection of towers by UAS, for example. By using UAS, the inspector doesn’t need climbing gear or to risk a fall, but the operator must still launch the UAS, inspect the tower, recover the UAS, get in a vehicle and drive to the next tower, and repeat.

Broader application of BVLOS operations will allow longer-distance operations to support agricultural businesses, land surveying, utility

inspection and even convenient delivery of critical goods. BVLOS is also crucial to operating at a higher aircraft-to-pilot ratio, which is an essential economic component of the future feasibility of the industry.

CHANGING THE REGULATORY FRAMEWORK

While the existing regulatory framework hasn’t yet adapted to meet the broad demand for commercial UAS operations, Jon Hanlon, director of UAS maintenance and airworthiness at Zipline, says it’s “overly simplistic” to suggest the challenges are purely regulatory or purely technology based.

“Zipline has conducted over 300,000 commercial deliveries at multi-national scale and across three continents over the last five and a half years,” said Hanlon. “We’ve learned firsthand that design, manufacturing and operational excellence, as well as a regulatory and certification regime based on real-world results, are all required to achieve safe, scaled drone flights.”

Notably, the FAA has recently sought to leverage such real-world results as well as community input.

Last June, the agency established the UAS BVLOS Aviation Rulemaking Committee (ARC) to address BVLOS operations. The ARC, made up of almost 90 industry and stakeholder groups, including members of NBAA’s Emerging Technologies Committee, was tasked with providing recommendations for BVLOS operations for long-line linear infrastructure inspections, industrial aerial data gathering, small package delivery, and precision agriculture operations, including crop spraying. In March, the ARC provided the FAA with a final report of more than 70 recommendations.

The FAA was scheduled to hold a public meeting on UAS BVLOS on June 22 through its YouTube channel and Facebook page to provide the public an opportunity to submit written comments or request a timeslot to provide oral comments.

“The importance of industry perspective, whether by participating in the ARC or by submitting comments in response to the ARC report, in establishing effective, safe and efficient policies and regulations cannot be overstated,” said Heidi Williams, NBAA’s senior director of air traffic services and infrastructure. “That

feedback guides the FAA's decision-making and provides insight into the industry that the agency just can't form independently."

IMPROVED SAFETY FOR ALL AIRCRAFT

Experts say traditional business aircraft and operations will see benefits from innovation occurring in the UAS space, including transfer of new technologies that will improve safety and provide workforce benefits.

"Increased automation will eventually come to crewed aircraft and will increase the overall safety level in crewed aviation. It will enable a new era of simplified pilot operations in which we can get to very safe, effective single-pilot crews – and in the future, uncrewed," said Damush.

Damush isn't talking about fully autonomous flight; rather, he's talking about the human "on the loop," using automation tools. He says AOPA's Joseph T. Nall Report shows that most fatalities in general aviation are a result of human error. Part 121 operations do not see that level of incident/fatality rate, and automation in the cockpit is a contributor to that.

To Damush, "the correlation is pretty clear," although he doesn't suggest full autonomy is the solution for every type of operation. Instead, keeping a human on the loop to manage contingencies and letting the aircraft systems do the work can lead to safer, more efficient operations. The key to success for this concept is for the systems to function predictably.

WORKFORCE BENEFITS

These same technology advances will also eventually help address workforce issues in business and commercial aviation by requiring fewer pilots per aircraft – reducing the current pilot strain felt throughout aviation – and creating new entry- and senior-level jobs in aviation throughout the UAS space and the country.

"Drones are a rewarding and growing pathway into aviation careers," said Hanlon. "This is especially the case as companies look to establish strong, diverse and inclusive teams at all levels of education and in all parts of the country."

For now, however, many commercial UAS operators are driven to request exemptions or waivers

"We've learned firsthand that design, manufacturing and operational excellence, as well as a regulatory and certification regime based on real-world results, are all required to achieve safe, scaled drone flight."

JON HANLON

Director of UAS Maintenance and Airworthiness, Zipline

from the various existing rules – Part 91, 107 or 135 – with limited FAA resources to manage multiple waiver and exemption requests.

Waivers and exemptions also create an unstable long-term operating environment, as they typically expire anywhere from a few days to two years and must be re-applied for to ensure continuity of operations. Each re-application carries a risk of being denied.

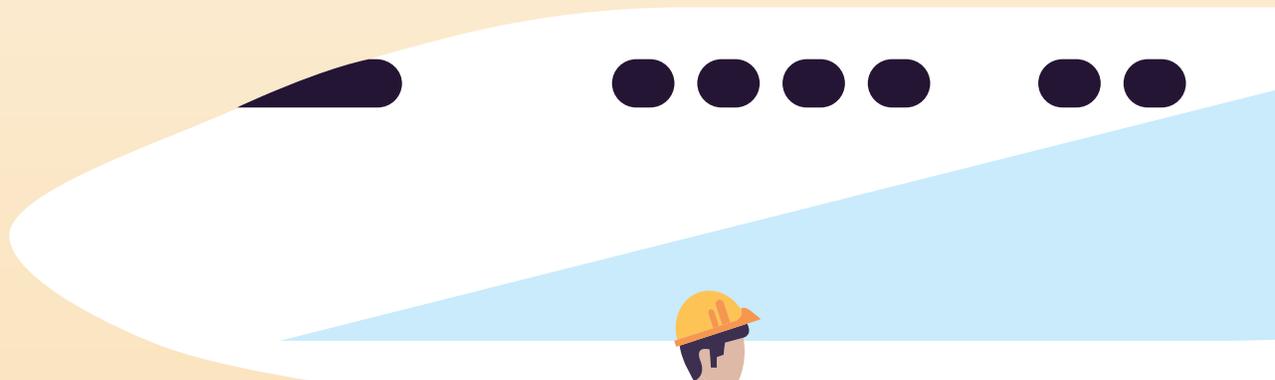
"Currently, BVLOS operations are trapped in a regulatory Catch-22," said Hanlon. "Data must show BVLOS operations can be conducted safely in order to operate, but the only way to obtain that data at scale is to allow BVLOS operations to occur."

But proven programs can provide a way out of this entanglement. Continuing analysis and surveillance systems and safety management systems already provide management frameworks to enable operators to assess risk and be proactive in making improvements. These could be aligned to operations conditioned on FAA-designated performance and safety targets.

Hanlon suggests the way forward should be to leverage the value of what already exists – 100 years of commercial aviation experience – while finding pragmatic approaches to enable UAS operators to begin BVLOS quickly. ✪

Review NBAA's unmanned aircraft resources at nbaa.org/uas.

MITIGATING SUPPLY CHAIN AND MAINTENANCE WORKFORCE CHALLENGES



Maintainers are doing their best to ensure the continuity of business aviation operations.

C OVID-19-related supply chain disruptions have complicated the maintenance mission of keeping business aircraft airworthy and mission ready. Couple that with the ongoing shortage of aviation maintenance technicians (AMTs), and business aviation maintenance is facing unprecedented dual challenges.

ONLY AS STRONG AS THE WEAKEST LINK

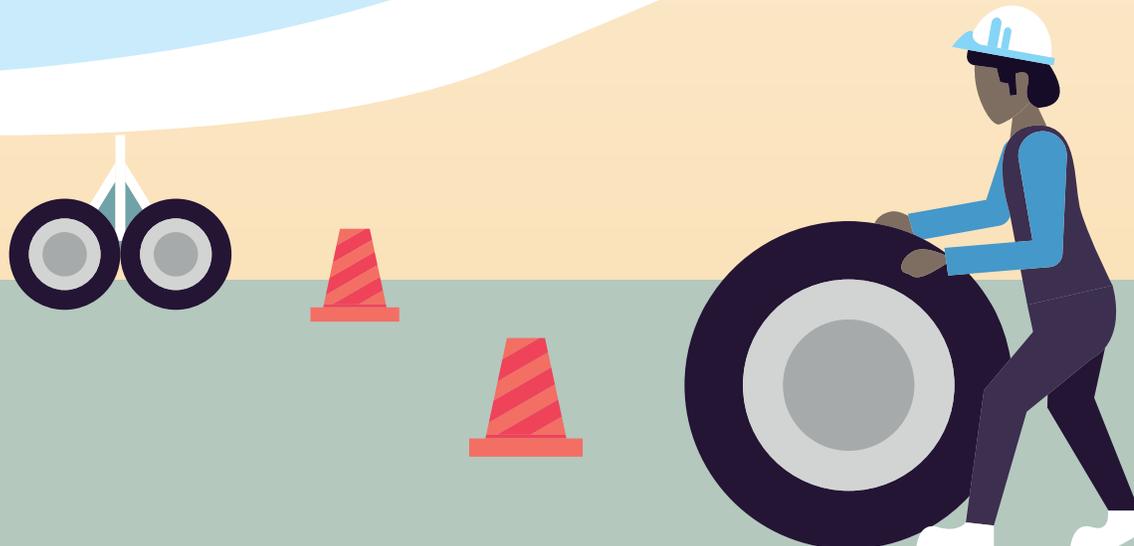
The supply chain is composed of many links, and like any chain, it is only as strong as its weakest link, said Frank Krafka, manager of material control for West Star Aviation.

“The supply chain challenges started in 2020 and have intensified during the past couple of years,” explained Krafka. “Chemicals and tires are the big ones, but it affects almost everything now.”

The supply chain links are not recovering at the same rate because each one has its own supply

chain of raw materials and needed components, many of them with their own certification requirements. Given those requirements, most manufacturers and distributors don't rely on just-in-time inventories.

However, the ripple effects of manufacturing shutdowns early in the pandemic are still being felt by suppliers, which are struggling to replenish parts inventories while striving to keep their customers flying. Suppliers are doing their utmost to recover from parts shortages and expedite a return to predictable, reliable deliveries. But no one can predict when the situation will return to a pre-pandemic normal.



MITIGATING SUPPLY CHAIN AND MAINTENANCE WORKFORCE CHALLENGES

“A lot of us got used to getting things quickly, and we need to recalibrate, be more patient and understanding of potential issues,” Krafka said.

“Aviation is adapting,” continued Krafka. “OEMs and distributors are mitigating their challenges. Operators are communicating with their providers to keep current on an ever-changing situation, and operators are prioritizing and planning their maintenance to accommodate any delays that arise. Improvement is around the corner.”

RECRUITMENT IS A LONGER-TERM CHALLENGE

Seeking solutions to meet the chronic AMT shortage has become a top priority for business aviation, including NBAA’s Maintenance Committee, which continues to promote business aviation maintenance careers through several outreach efforts, says Stewart D’Leon, CAM, NBAA director of environmental and technical operations.

Bryan Maloney, sales & recruiting manager at Jet Aviation Staffing, is at the forefront of these efforts. A business aviation recruiter with two decades of experience, he’s a member of the NBAA Maintenance Committee and chairs its Workforce Development Subcommittee, which has a three-prong strategy for meeting the challenge.

The subcommittee has three subgroups, each dedicated to promoting business aviation maintenance careers to a select audience. The Early Education Group focuses on middle and high school students, grades 8-12. The Secondary Education Group targets two- and four-year AMT schools and programs, and the Military Group is seeking to recruit people leaving the armed services in order to grow the pool of business aviation AMTs.

The foundation of each of these efforts is promoting business aviation as a truly viable career option. Traditionally, business aircraft operators have maintained a low public profile, a

disadvantage in an era when other segments of aviation and other industries, such as wind energy, are vying for the knowledge, mechanical aptitude and skills that potential AMTs possess.

“We’re creating presentations that members can share with these groups, and we’re developing a program that opens the hangar doors to youth and young adults on or around May 24, which is National Aviation Maintenance Technician Day,” explained Maloney. [May 24 is the birthday of Charles Edward Taylor, who built the Wright Flyer’s engine.] Several prominent Part 91 flight departments, MROs and OEMs are already on board with this outreach plan, noted Maloney.

Another initiative is the ongoing effort by a number of organizations to reclassify AMTs by creating a new Department of Labor classification. Holders of FAA airframe and powerplant (A&P) certificates are now classified as “Aircraft Mechanics and Service Technicians,” a combination of certificated and non-certificated individuals in the major group of “Installation, Maintenance and Repair Occupations.” This combination of different types of workers prevents the accurate count of certificated A&Ps working in aviation, their locations and other information needed to forecast future workforce numbers.

Large maintenance companies that provide depot-level maintenance have done a good job recruiting those who don’t have an A&P certificate because they work under the company’s repair station certificates, said Maloney. “This is a potential solution for larger business aviation operations that need more than a handful of techs, but this requires veteran A&Ps to supervise and mentor them.”

FILLING THE PIPELINE

Developing an apprenticeship program is another way to attract tomorrow’s AMTs. Generally, in a two-year program, the apprentice earns a paycheck, benefits and the on-the-job training, along with the formal education necessary to earn an A&P certificate. In return, the apprentice agrees to work for a defined period after certification. As the last Baby Boomers approach retirement, this is an opportunity to retain veteran technicians as teachers and mentors.

Meanwhile, retaining experienced technicians is essential to the continuity of aircraft operations.

“Everyone wants the best, most skilled technicians, but those people come at a price,” said Maloney.

Technician retention, however, isn’t all about money, it is about flexibility, involvement and opportunities to expand and develop their aviation interests.

“Life happens to all of us,” said Maloney, “and the employer that works with the individual’s [unique] situation is more likely to retain the tech than an employer who offers nothing more than 9-to-5 work on that airplane over there.”

In hundreds of military recruiting conversations, Maloney said what consistently surprised him was that “most of them had no idea that this world of business aviation existed.”

Changing this situation, says Maloney, “is an excellent opportunity for business aviation, especially when combined with the Department of Defense SkillBridge program, which enables military techs to work for and learn from an industry partner during their last 180 days of active duty.”

“A&P schools can only educate so many people, and right now they are at full enrollment,” said Lynze Price, a maintenance technician at Amway and leader of the Early Education Group of the NBAA Workforce Development Subcommittee. “The key to keeping these programs fully enrolled is to increase the supply of people interested in business aviation careers by showing them when they are in middle and high school what the industry has to offer.” To help achieve that, the work group is now revamping its presentations to incorporate more video.

MODIFYING ENTRY REQUIREMENTS

Business aviation employers also need to reconsider their prerequisites as well.

“Back in the day, MROs and OEMs were more open to hiring and training people off the street who expressed interest,” Price said. “That has changed, and employers are now more interested in hiring certificated individuals so they do not have to deal with training time and expense. Some have resumed their training efforts, but we’re still behind the curve.”

Flight departments often don’t consider A&Ps immediately after they graduate because they want technicians with experience.

“But a growing number of flight departments are filling their tech positions by first interviewing people for an internship program,” said Price, who was Amway’s first intern. “I got hired when a tech retired after 40 years. I give them credit – it was a bold move because I’d just graduated from Embry-Riddle Aeronautical University.”

Regardless of a tech’s experience, flight department members still need to teach new hires about their aircraft and culture to help develop a model employee.

“If you use an internship to vet, and then train them the way you want, you start with someone with no bad habits and mold them into the quality tech you want for your department,” said Price. ❖

Review NBAA’s workforce initiatives at nbaa.org/workforce.

“A lot of us got used to getting things quickly, and we need to recalibrate, be more patient and understanding of potential issues.”

FRANK KRAFKA

Manager of Material Control, West Star Aviation



Everywhere Is Within Reach

Isotropic Networks makes connectivity – and connections – with business aviation.

By Lowen Baumgarten

Photos by Morgan Anderson Photography





Isotropic Networks utilizes its Cessna Citation 550 (left) to fly support technicians to customers for same-day service across the U.S.

MEMBER PROFILE

Since the earliest days of the internet, Isotropic Networks has developed technologies and services that have pushed the satellite industry forward. Even after 30 years of success, the Lake Geneva, WI-based company is driven by the same entrepreneurial spirit it was founded with in a Chicago radio station.

Isotropic serves clients that put a premium on their connectivity: oil and gas companies from the Permian Basin to Pennsylvania; maritime customers in Florida, the Caribbean and the Mediterranean; and utility operators all across the U.S. The satellite telecom company solves complex technical problems, ensuring dependable service and uptime.

time we're going to be there," explained James Boden, the company's chief satellite scientist.

The aircraft carry installers, technicians and sales teams to customer sites. Whenever troubleshooting by phone doesn't resolve an issue, technicians can fly to provide same-day, on-site support.

"We're not at the mercy of the airlines. We're always ready to go," declared Hank.

FLYING FROM THE START

Isotropic Networks was founded in 1992, and from day one, aviation has been a part of the company's success.

"I learned how to fly when I was a wet-behind-the-ears salesman," said Hank.

"Business aviation enables us to be specific with the client regarding the date and time we're going to be there."

JAMES BODEN

Chief Satellite Scientist, Isotropic Networks

"What Isotropic is really all about is unrivaled certainty, so when we make a commitment to our clients, they know we're going to be there," said Hank Zbierski, Isotropic's CEO and chief catalyst.

"To provide true world-class service, we need to be on site and in locations where a commercial flight is impossible or impractical," added David Greiner, Isotropic's transformation consigliere. "That often means making trips to customer facilities on a moment's notice, something only possible using a business aircraft."

Isotropic flies about 400 hours a year out of Wisconsin's Burlington Municipal Airport (BUU), where it has a Citation 550 SII, as well as a Cessna 172.

"Business aviation enables us to be specific with the client regarding the date and

"Aviation has been involved in every business I've been in."

Early on, Isotropic flew a variety of piston-powered aircraft. The company's first turbine-powered airplane was a Cessna Citation 501, purchased in 2010, the same year that Chief Pilot Ron Nelson, who has over 19,000 flight hours, came aboard.

The Citation 550 SII replaced the Citation 501 when missions required more range and team members on each trip.

"Our clients have the certainty that we can be on site at a moment's notice," said Greiner. "Even with the advancements in remote meeting and communications technology, there is still a big advantage to being face-to-face, especially when we can bring a whole team in."

Besides customer visits, the jet is also used to pick up associates who work

MEMBER PROFILE

Knowing firsthand the value of business aviation, Hank Zbierski built Isotropic's large dish array just 10 miles from a GA airport.

remotely in other states and fly them in for training and important meetings.

"The airplanes have opened the whole world to us," said Lynn Zbierski, who is Hank's wife and Isotropic's president.

MAKING IT EASY TO WORK HARDER

Nelson is the captain on every Citation SII flight. Hank still flies sometimes, but his son Ryan, who is Isotropic's director of mission assurance, has taken over much of the business flying. Ryan serves as first officer when the jet is operating in busy airspace, and he flies the Cessna 172 single-pilot on shorter missions around the Midwest.

Ken Nerge is Isotropic's full-time maintenance technician who pre-flights and post-flights every mission and makes sure the aircraft inspections are up to date.

"Maintenance is where safety begins," said Nelson. "Fortunately, the Citation SII doesn't require that much maintenance, but it was built in 1986, so it has a combination of analog and digital systems. So, we need a really good shop that understands how to integrate those." Isotropic relies on Flightpath of Brooksville, FL, to maintain its aircraft.

"I learned how to fly when I was a wet-behind-the-ears salesman. Aviation has been involved in every business I've been in."

HANK ZBIERSKI *CEO and Chief Catalyst, Isotropic Networks*

The Citation frequently flies between Wisconsin and Fort Lauderdale, FL, where Isotropic has an office. Isotropic also flies to client locations in the Midwest, New Mexico, Utah and much of the East Coast. International destinations include Canada and the Bahamas.

A typical flight to Fort Lauderdale involves up to six employees departing Wisconsin at 7 a.m., conducting meetings en route and arriving at the Florida office by noon. After business is done, the passengers board the jet and are back home by 6 p.m. Because the plane can carry a team of employees, all the decision-makers and key personnel are together, so any topic that comes up is handled on the spot, with very little left unanswered.

Employees who fly on the company airplanes experience the power and

efficiency of aviation firsthand. One employee said, "I had never been on a business jet before. It's fantastic to be able to take a trip with the team without the pain of dealing with [commercial] airports. It's a big motivator for all of us to work harder."

CONNECTING THE PLANET

Isotropic's most important business aircraft flights are rapid-response missions.

"One morning, I went to the hangar at 8 a.m.," recalled Anthony Philips, an Isotropic technician. "The plane was ready, and an hour later we were in Paducah, KY, where a tug vessel needed a new antenna. We set it up, called our operations center to confirm the signal was strong, and an hour after we boarded that boat, we were back on the plane headed home."

Chief Pilot Ron Nelson (below right) and Ryan Zbierski crew the company's Citation 550. Employees who want to learn to fly can utilize the company's Cessna 172 (right).



On trips like these, the planes don't just carry technicians; they also transport satellite dishes, antennas, routers and cables – components that could not be brought on an airliner. The technicians even use the company hangar to prepare equipment for transport to customer sites.

"When clients have purchased a system with a complex configuration, we can fabricate the equipment, test it and package it in our hangar, in a clean environment, and load it directly onto the plane," said Ryan.

SAFETY, CONFIDENCE & REASSURANCE

When it came time to write a flight operations manual, Isotropic adopted many of the safety guidelines NBAA provides online to new Part 91 operators.

"Being with NBAA, we can make sure we're doing things to best practices – training, maintenance, staying current with regulations," said Ryan.

In preparing for a specific mission, the aviation team assesses many factors, including weather and alternate airports. Max duty time is 12 hours. "The safety of our passengers is – and always will be – the first priority," declared Greiner.

Isotropic's pilots get recertified every year to maintain their type ratings. They also occasionally conduct training flights to sharpen their skills for dealing with situations such as high-crosswind takeoffs.

Clearly, business aviation is essential to the service and reliability Isotropic promises clients.

"Having a business airplane gives us the confidence to let our clients know that we can be on-site for them on a moment's notice," said Greiner. "This reassures them that they are taken care of. To say they appreciate that is an understatement. We often hear them say to their co-workers, 'They flew in on their own plane!'" ❖

Learn more about Isotropic Networks at isotropic.network.

A UNIQUE EMPLOYEE BENEFIT: FLIGHT TRAINING

"For our employees, aviation enables them to visit clients they may have only spoken with on the phone, to get out in the field and do install work as well," said David Greiner, Isotropic's transformation consigliere.

Isotropic has operated many different aircraft over the last 15 years, starting with a Piper Archer that CEO Hank Zbierski flew to visit customers in five states. After acquiring its first jet, the company added a second airplane: a Cessna 172.

Outfitted with a short-takeoff-and-landing kit, the single-engine piston airplane can utilize runways less than 700 feet long, enabling Isotropic teams to access very rural customers. In addition to being ideal for missions of less than 150 miles, the 172 also enables Isotropic to offer a unique employee benefit: any worker who wants to learn to fly can use the airplane for free. They only need to pay for the instructor's time.

"If any of our employees want to learn to fly, we take care of everything," said Hank Zbierski, Isotropic's CEO and chief catalyst. "I love pilots and aviators working for us, because they're very disciplined, and our business requires a lot of discipline."

SNAPSHOT: ISOTROPIC NETWORKS



Aircraft: One Citation SII and one Cessna 172



Base: Headquartered at Wisconsin's Burlington Municipal Airport (BUU)



Personnel: One chief pilot, one executive first officer and one maintenance technician



Management: Operator Privacy in the ADS-B Environment

Commercial flight tracking websites are a boon for aviation enthusiasts, but they also raise significant privacy concerns for business aviation. The FAA's Limited Aircraft Data Displayed (LADD) and Privacy ICAO Address (PIA) programs help shield aircraft operator information from prying eyes.

Replacing the former Block Aircraft Registry Request (BARR) program, LADD enables business aircraft owners and their designated representatives to submit requests to limit data shared by the FAA with individual third-party tracking providers.

"LADD allows operators to essentially navigate in the NAS (national airspace system) anonymously, without sharing their information with flight tracking services," said Heidi Williams, NBAA senior director for air traffic services & infrastructure. "Operators may continue sharing aircraft data with individual vendors they utilize for their business, or they can block it directly at the source and keep that information from being shared with any commercial flight tracking provider."

"The FAA's Limited Aircraft Data Displayed program allows operators to essentially navigate in the NAS anonymously, without sharing their information with flight tracking services."

HEIDI WILLIAMS
Senior Director, Air Traffic Services & Infrastructure, NBAA

Although Williams noted that the FAA has "really stepped up to enhance security of those data-sharing agreements" in its transition from BARR to LADD, she cautioned that this does not prevent transmission of aircraft-identifying data via automatic dependent surveillance broadcast (ADS-B) to privately owned

receivers used by an increasing number of flight tracking sites.

That's where PIA comes in. "PIA consists of two parts designed to interrupt identifiable information shared by an aircraft's Mode-S transponder," explained Doug Carr, NBAA senior vice president of safety, security, sustainability and international operations. "The first allows the FAA to assign a non-published, six-digit ICAO hex code to that transponder that doesn't translate back to any aircraft registry information in the FAA's database."

Under PIA, operators must also secure a third-party flight ID not tied to any data in the FAA registry, which will then be displayed in lieu of the aircraft's tail number.

"In most cases, an aircraft operating under PIA will still show up on tracking sites as it will still be sharing information," Carr added, "but the information displayed won't connect to any ownership or operator data."

The FAA established a 60-day baseline for operators to request a new ICAO hex code under PIA, although Williams noted that the agency can work directly with operators that believe their code has been compromised to shorten that time frame. "Events over the last few months have really highlighted the critical time element when your information has been compromised," she said.

However, Carr cautioned it still may not be a quick process. "Every aircraft and avionics suite is different and will have some uniqueness in getting in to change the code," he said. "Also, each code change is considered a maintenance item and there will need to be logbook entries and appropriate personnel involved."

For the moment, PIA also applies only to FAA-controlled domestic airspace; flights operating along oceanic routes, even near the U.S. coast, are not shielded at this time. However, the FAA is working with ICAO to coordinate expansion of the PIA program.

NBAA recommends operators use both LADD and PIA to maximize security. ❖

Review NBAA's flight privacy resources at nbaa.org/privacy.

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NBAA FLIGHT PLAN

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nbaa.org/news/flight-plan-podcast

MEMBER CENTRAL



PHOTO © JOHN HARRINGTON

Get Airspace/Airport Alerts Delivered Directly to Your Inbox

You can consider NBAA's Air Traffic Services (ATS) team an extension of your flight operation. Co-located at the FAA Air Traffic Control System Command Center just outside of Washington, DC, the NBAA ATS team represents the interests of business aircraft operators in order to ensure that they have equitable access to airports and airspace throughout the National Airspace System.

Because the ATS team has direct access to real-time operational information from the FAA, they're able to keep NBAA members informed about the latest NOTAMs, TFRs and other ATC developments that might impact their flight plans. To keep business aircraft operators informed and up to date, the ATS team emails Airspace Alerts directly to those that have signed up for this service.

To start receiving Airspace Alerts from ATS simply:

- (1) Log in to my.nbaa.org
- (2) Scroll down to "Communication and Privacy Preferences"
- (3) Make sure the box next to Airspace/Airport Alerts is checked.

NBAA's Air Traffic Services team represents the interests of business aircraft operators to ensure that they have equitable access to airports and airspace throughout the National Airspace System.

Additionally, NBAA members can elect to sign up for enhanced ATS services so they can receive a more hands-on, customized type of flight planning assistance from NBAA's ATS specialists. ✨

Learn more about NBAA Air Traffic Services at nbaa.org/ats.



Member Benefits



ON-DEMAND EDUCATION

Since 1998, NBAA's Professional Development Program (PDP) has helped business aviation professionals ascend in their careers by preparing them for management roles within their companies. Specifically, NBAA offers PDP courses in business management, human resources, leadership, operations, and technical and facilities services. These courses are conducted in conjunction with many NBAA events. But did you know you can also take them online? Check out NBAA's online education web page. nbaa.org/on-demand

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Professional Development

NBAA will offer a variety of professional development program (PDP) courses in conjunction with the 2022 Business Aviation Convention & Exhibition in Orlando, FL, from Oct. 18-20. Below are descriptions of some of these courses.

MANAGEMENT FUNDAMENTALS FOR FLIGHT DEPARTMENTS

This two-day workshop, to be held Oct. 16-17, will provide managers with information about safe operations, regulatory compliance and basic management practices, including budgeting, accounting, cost controls, vendor selection and tracking, record keeping and planning. Other topics to be covered include personnel issues and communication. Participants will review case studies and learn how to use templates, forms and checklists.

BUILDING AND LEADING HIGHLY EFFECTIVE TEAMS AT WORK

This two-day course, to be held Oct. 16-17, will make attendees think differently about teams and help them gain the skills needed to develop, lead and be a part of a highly

effective team. Key concepts will include motivation and engagement, organizational culture, strength-based team philosophy, recognizing personalities, conflict management, mutualism and emotional intelligence.

SMS FOR BUSINESS AVIATION

This course, slated to be held Oct. 17, will review all aspects of safety management systems, including SMS benefits, safety policy and objectives, safety risk management, safety assurance and safety promotion. Both FAA and ICAO SMS guidance will be reviewed. By fully understanding SMS concepts, course participants will be able to help create an SMS or support an existing one.

AVIATION LEADERSHIP

This two-day workshop, to be held Oct. 21-22, will focus on values-based leadership, leading with a vision and leading for success. The interactive course will enable participants to practice and develop their skills, providing them with tangible takeaways designed to help them become better leaders.



Events Calendar

October

Oct. 16 - 17

Tax, Regulatory & Risk Management Conference | Orlando, FL

Oct. 18 - 20

Business Aviation Convention & Exhibition (NBAA-BACE) | Orlando, FL

January

Jan. 24 - 27

Schedulers & Dispatchers Conference (SDC2023) | Nashville, TN

February

Feb. 13 - 15

International Operators Conference (IOC2023) | Austin, TX

Feb. 27 - March 1

Leadership Conference | Charlotte, NC

May

May 2 - 4

Maintenance Conference | Hartford, CT

May 23 - 25

European Business Aviation Convention & Exhibition (EBACE2023) | Geneva, Switzerland

[NBAA.ORG/EVENTS](https://nbaa.org/events)

New Certified Aviation Managers

More than 700 business aviation professionals from all segments of the industry have earned the Certified Aviation Manager (CAM) credential. The people listed here are among the latest ones to join this elite group of business aviation professionals.

Jeffrey Adelman, CAM

Senior Captain
Nationwide Aviation Business Center

Lisa Archambeau, CAM

Vice President, Facilitator & Strategist
ServiceElements International

David Bailey, CAM

Regional Sales Director - Great Lakes
Dassault Aviation

Diane M. Bassetti, CAM

Consultant, Aviation Ops
Nationwide Aviation Business Center

Jared Bender, CAM

Global Express Captain

Michael Graban, CAM

Pilot
Merck, Sharpe & Dohme, LLC

Timothy Morton, CAM

Client Aviation Manager, Captain G650
TAG Aviation

Terrance Moser, CAM

Regional Sales Manager
Collins Aerospace

Kelly Nelson, CAM

Dispatcher

Andrew J. Wilmoth, CAM

Flight Standards Captain, Koch Aviation

CORPORATE AVIATORS

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corporateaviators.com

Recognizing Flight Attendants as Trained Professionals

Cabin crewmembers are part of a team that ensures safety, as well as excellent service.

Susan C. Friedenberg laughs when recalling how close she came to giving up on what has been a storied career as a professional flight attendant and training consultant. It was 1970, and she was just four weeks into her initial training for a large airline.

"I was a hippie," she explained. "I told my parents I was quitting. My mother replied, 'We already bought tickets for your graduation. You're not quitting.' To this day, I still thank her!"

That led to 15 years at the airlines, followed by more than three decades as a business aviation flight attendant.

Upon making that transition she soon realized how lax emergency training requirements were for business aviation flight attendants at the time. Friedenberg actively sought training on her own and ultimately formed her own training company, Corporate Flight Attendant Training.

While her 450-page training program encompasses all

"The FAA must mandate that any aircraft over 20,500 pounds with a seating capacity of 8-9 people have a trained flight attendant on board."

aspects of the role, egress training remains at the forefront of her safety priorities.

"You're usually the only crew member in a business jet cabin," she noted. "You must know how to lift a hefty pilot or passenger out of their seat, on your own, and evacuate them off the airplane."

Friedenberg has seen perceptions of business aviation flight attendants positively evolve over the years, but she also believes there's more to be done so that these professionals are considered vital crew members, "and not simply cabin servers or another passenger."

"The FAA must mandate that any aircraft over 20,500 pounds with a seating capacity of 8-9 people have a trained flight attendant on board," Friedenberg declared. "Why is there an AED [automated external defibrillator] on board if no one in the cabin knows how to use it? Someone going into cardiac arrest can't defib themselves!"

Fostering effective communication among all crew members is another important step in the process of elevating flight attendants. "They are a team of three," Friedenberg said, "and such complete and open communication among the flight crew team is reflective of the entire flight department." ❖

SUSAN C. FRIEDENBERG has worked as a professional flight attendant her entire career. Earlier this year, she was recognized for her contributions to the industry with the AeroTime Aviation Achievement Award as part of the publication's Women in Aviation Campaign.



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NBAA NEWS HOUR
2021 NBAA-BACE Edition

NBAA News Hour:
2021 NBAA-BACE Edition – Meet The Regulators

September 30 | 11 a.m. - 12:30 p.m. EDT

[SAVE ME A SEAT!](#)

Whether your operational questions involve COVID-era considerations or other issues, this first-ever virtual 2021 NBAA Business Aviation Convention & Exhibition (NBAA-BACE) session will feature key personnel from the CBP, CDC, and FAA.



Here's What Happened at 2021 NBAA-BACE

Did you miss anything at the 2021 NBAA Business Aviation Convention & Exhibition (NBAA-BACE)? Take a look back at one of the most exciting and impactful conventions ever.



Amazing 2021 NBAA-BACE Propels Industry to New Heights

As business Vegas for the years, the show industry built growth, fast-p commitment shared disse

[READ MORE](#)

U.S. Officials Prepare for AAM Introduction

During a panel discussion on advanced air mobility, Chris Rocheteau, acting associate administrator for aviation safety at the FAA, said he believes the first commercial AAM vehicle could be certified as soon as late 2023. That timeframe places significant pressure on the agency to have a regulatory framework in place.

[LEARN MORE](#)



Business Aviation Pledges Net-Zero Carbon Emissions By 2050

Business aviation leaders at NBAA-BACE expanded on a set of bold

NBAA
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2022 NBAA Business Aviation Convention & Exhibition (NBAA-BACE)
Oct. 18-20, 2022 | Orlando, FL

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INSIDER DAILY

Thursday, October 14, 2021

Advanced Air Mobility Innovators Outline the Path Forward

AAM company leaders described their visions for the future during the Day 2 keynote at NBAA's Business Aviation Convention & Exhibition (NBAA-BACE).

DUNCAN AVIATION

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WHEELS UP

NBAA-BACE REPORT

AAM Innovators Panel Launches Inspirational Day 2 Keynote

The Day 2 keynote of the 2021 NBAA Business Aviation Convention & Exhibition (NBAA-BACE) outlined the future of aviation and integration established throughout the show for day, beginning with reports of updates to the emerging advanced air mobility (AAM) segment. These are the companies leading their companies into the future, and will have all needed substantial resources, said NBAA President and CEO Ed Biele. The AAM panel was moderated by frequent commercial pilot and space artist Dr. Ben Proctor and championed by Optimism and Entrepreneur Johnny Horn. Read more about the Day 2 keynote.

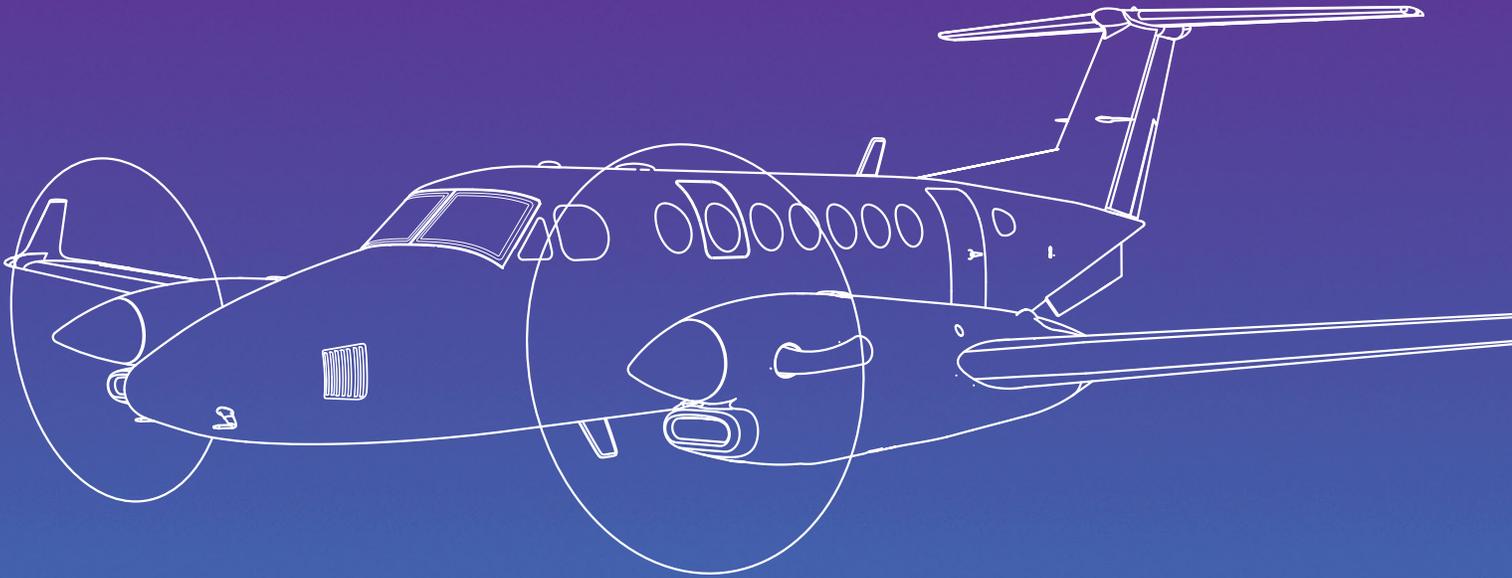
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SAVE THE DATE

Join your colleagues and fellow industry professionals for the most important three days of business aviation, featuring exhibitors promoting their latest products and services, 2 aircraft displays – one inside the exhibit hall and the other outside at Orlando Executive Airport, and more than 50 education opportunities. Save the date and visit the NBAA-BACE website to learn more.

LEARN MORE | nbaa.org/2022