Three hundred experts and leaders from around the world gathered at the RTCA Global Aviation Symposium to explore and discuss current and emerging issues throughout aviation. The Symposium offered 12 information-packed sessions ranging from the collaborative efforts by the aviation industry and the FAA to modernize the U.S. air traffic control system, to the latest initiative on the Northeast Corridor.

RTCA presented awards recognizing committee leaders for their dedication and hard work brought to the creation of policy recommendations and performance standards, and attendees were given the opportunity to network with executives and senior leaders across the government and the global aviation industry.
The 2017 RTCA Symposium began with a frank discussion between RTCA Chairman Craig Fuller and RTCA President Margaret Jenny about the state of the organization. During the conversation, President Jenny shared details about how the organization exists to coalesce the experience and knowledge of the volunteers from the aviation industry in response to FAA taskings.

Recruiting volunteers and leveraging their time and talents in developing consensus among RTCA stakeholders is crucial. Without consensus, Margaret told the audience, the industry-developed standards and policy recommendations RTCA issues may not withstand FAA scrutiny. “Even though it is advice, and the FAA can take it or leave it, they are involved throughout [the process],” Margaret said. “In the case of standards, the FAA references it as a means of compliance. The shortest time from Committee work to implementation by reference was the ADS-B [standard] that happened the same day, but sometimes they can take up to six months. That’s why there’s so much work that goes into these standards, because they become a means of compliance.”

When asked about the emphasis on transparency and whether it has been an advantage, Margaret stood on the side of openness. “It’s a good thing because you have as many people as possible involved in the process,” she said. “With an ability to influence the outcome, there’s less likelihood of people coming back around and trying to undermine it. It does come with some amount of overhead to ensure that kind of transparency.” That work includes maintaining a platform where committee members can collaborate on documents. It also involves the planning of numerous meetings among committee members, who range from on-the-ground engineers, to pilots, to FAA regulators. And looming over all of it is the specter of funding and sponsorship, which is necessary to keep the RTCA machine well-oiled.

Addressing discussions in Congress about FAA restructuring and the potential effect on RTCA, Margaret explained, “My sense is that in any reform, the FAA will continue to need and work with RTCA the [same] way they have since 1935 to do standards. That, I think, will not change. There’s a sense that whatever happens, there’s going to continue to be a need for probably even beyond what a board would provide. A need for a venue, like the NAC. Critical to maintaining that venue, Margaret told the audience, is staying connected with the industry and with each other through RTCA resources like the symposium and RTCA’s website, and demonstrating the continuing value of the critical industry relationships that RTCA supports.
NEXTGEN ADVISORY COMMITTEE: REALIZING THE RESULTS OF A NEXTGEN FLEET

Moderator: Craig Fuller, The Fuller Company
Panelists: Mark Baker, President, Aircraft Owners and Pilots Association (AOPA)
Carl D’Alessandro, Vice President, Civil Programs, Global Business Development Organization, Harris Corporation
Craig Drew, Senior Vice President, Air Operations/Director of Operations, Southwest Airlines
Jim Eck, Assistant Administrator for NextGen, FAA
Ginger Evans, Commissioner, Chicago Department of Aviation
Tracy Lee, Vice President of Network Operations, United Airlines

When asked how flying has changed with the implementation of NextGen, Mark Baker said that the world today was a wonderful place for general aviation pilots. “The location I flew yesterday was...basically cleared direct,” he said. “Just try to imagine it 25 years ago, when you were so happy to come off a dot-dash-dot-dash-dot, and then it was LORAN to R-Nav to today, using GPS.”

Craig Drew concurred, saying that advances in flight technology have been a boon for the airline pilots as well. “It really is impressive when you look at the new technology—RNP, and GPS, and others,” he said. “When Southwest bought the 737-300, we actually dumbed it down so it would look like a 200...but that's all behind us.” He also stated that by the end of September, Southwest will have a 100 percent NextGen fleet.

Underpinning new flight systems is a technology developed by Harris Corporation. Carl D’Alessandro explained the evolution of air traffic control technology, beginning with the first enroute voice switch, which was installed in a room the size of a soccer pitch. “When I walk around in an air traffic control center today, I'm struck by how empty they are because the technology has gotten
The Symposium Sessions can also be viewed online. Visit www.symposium.rtca.org and click on the Agenda Page.

Carl said, “I recently read a GAO report from June 4, 1980, complaining about how we can’t get the conflict probe to work because there’s not enough memory in computers. And of course, we don’t have those issues anymore...the technology has really advanced to the place where you can do some remarkable things.”

Ginger Evans remarked on the changes she has seen at Chicago Midway and O’Hare airports, saying that NextGen has spurred a number of changes that have enabled the airports to more efficiently use their space. “There has been a big push in the last 20 years to not just build new runways, but to build them better. The combination of technology, collaboration and real-time information is what made the incremental jump from the long-standing procedures possible, and we showed that we could reduce spacing in IFR conditions safely.”

When asked about the difficulties of coordinating surface management with flight management, Tracy Lee said that operations underwent a serious transformation to achieve the industry’s current goals of increasing reliability, predictability, and efficiency. “You talk about the transformation that’s occurred in the industry over time, and clearly that’s had a huge impact on safety. That alone is enough to justify everything that we’re doing,” he said.

Jim Eck took a more cautious approach to the efficiencies generated by the NextGen program and reminded attendees that keeping a close eye on the interrelation of flight metrics and understanding their impacts is necessary for creating a balance between reliability and efficiency. “Getting efficiency at an airspace level or at a surface level or on a particular surface or in a particular airspace is interesting and helpful, but it isn’t going to move the needle on the entire systems capability,” said Jim. “So that is one of our challenges. We’ve got to be sure as a community that we understand that, too.”

The conversation began with the panel’s thoughts on the progress of the DAC to date. Captain Tim Canoll said that safety was on the mind of everyone on the Committee, and that this should be the group’s highest priority.

Dr. Robie Samanta Roy agreed, saying that despite the enormity of their challenge, the wider community of airline pilots, general aviators, hobbyists, and regulators will ultimately come to agreement on regulations because each has a stake in the conversation. “The sheer complexity of this multi-dimensional problem at the national level is very significant,” he said. “I think the FAA and RTCA did a great job of making sure that large-systems integrators, start-up companies, users, and professional associations interests were a top priority.”

In addition to the complexities of all the stakeholders involved, some participants in the conversation also have their
own competing priorities internally, explained by Jaz Banga. He said that cities would like to use drones for police operations, inspections, and other functions, but officials and the public worry about the harm that could be caused by careless users or purposeful bad actors.

Regarding access of unmanned aerial systems to the NAS, Trish Gilbert iterated that accommodation of drones in the NAS is much different from full integration of UAS into the NAS. “We still need the technology around sense-and-avoid or detect-and-avoid. And until we get that, we're going to continue doing what we're doing today, which is accommodate those that fly through our system,” said Trish. “And when you accommodate instead of fully integrating safely, then you have workflow issues, airspace issues, and all kinds of things that could be problematic.”

Brendan Schulman added another perspective to consider by identifying some of the benefits for governments and airlines of having drones in the NAS. “We did a survey of media reports, and we found that drones have already saved at least 59 lives in the past two years,” he said. “There's a safety positive case, and we see drones being used at airports around the world to help improve airliner safety. So we have to take that into consideration even as we try to address the safety practices and local government concerns. And then we have balance, and then we can move forward.”

“I think RTCA does a really good job of facilitating panels that don't feel stuffy, and I think the panelists feel very comfortable speaking candidly and honestly.”
FAA Administrator Michael Huerta congratulated the award winners and addressed the many RTCA volunteers who meet regularly to solve what he called "the most pressing aviation policy issues of our time".

Huerta also discussed realigning the perspectives of multiple stakeholders within the industry, to create a space within RTCA’s charter and within aviation to enable productive conversations among a myriad of industry leaders and stakeholders that solve real problems in the national airspace. “We’ve come to realize in recent years, I think more than ever, that we have to focus on the business of aviation—not just the technologies, and not just the stakeholders,” Michael said. “We have to determine the needs of the aviation community and forge a consensus on how to set priorities in ways that will ensure the greatest advantage to users of the system.”

He applauded the more than 50 award recipients for their efforts to improve the aviation industry. “As an aviation community, we're very fortunate to have people like you who volunteer their time. Your efforts and your expertise contribute significantly to the many collaborative efforts that help ensure the safety and success of aviation.”

"Your efforts and expertise contribute significantly to the many collaborative efforts that help ensure the safety and success of aviation.”
— Michael Huerta
Congratulations to RTCA Achievement and Jackson Award Winners!

Achievement Award

The RTCA Achievement Award is the organization’s highest annual honor, recognizing those who have made the most significant contributions to RTCA’s mission and the aviation community over the last year.

Rick Heinrich, Rockwell Collins, Inc.

Paul McDuffee, Insitu, Inc.

Dr. George T. Ligler, Project Management Enterprise Inc.

Jim Crites, Jim Crites, LLC (formerly of Dallas Fort-Worth International Airport) and Brian Townsend, American Airlines

William E. Jackson Award

The William E. Jackson Award is given to an outstanding graduate student in the field of aviation electronics and telecommunications as a memorial to William E. Jackson, who was an enthusiastic supporter of student engineers.

Dr. Nicholas P. Hanlon graduated from the University of Cincinnati, and completed his dissertation on Simulation Research Framework with Embedded Intelligent Algorithms for Analysis of Multi-Target, Multi-Sensor, High-Cluttered Environments. Dr. Hanlon is currently an Aerospace Engineer for Air Force Research Laboratories at Wright-Patterson Air Force Base.

Dr. Nicholas P. Hanlon, University of Cincinnati
Outstanding Leader Award

The RTCA Outstanding Leader Award recognizes the added demands placed on the RTCA Committee Chairs and participants who serve in leadership roles, to ensure their respective committees publish high-quality documents.

Congratulations to RTCA Outstanding Leaders!

Laurent Azoulai
Airbus

Sai Kalyanaraman
Rockwell Collins, Inc.

Bill Carson
The MITRE Corporation

Steve Darr
Dynamic Aerospace Inc.

Chuck Stewart
United Airlines

Jerome Condis
Airbus

Jane Hamelink
Thane

Thierry Lelievre
Altran

Frederic Picard
Thales

Thomas Mustach
Federal Aviation Administration

Randy Bone
The MITRE Corporation

John Moore
Rockwell Collins, Inc.

Steve Van Trees
Federal Aviation Administration

Dawn Gidner
Honeywell International, Inc.

Jim Finley
Rockwell Collins, Inc.

Eric Kehoe
Avtech Tyee Inc.

Billy Martin
WSU-NIAR

Andrew Diaz
Panasonic

Stephan Schulte
Lufthansa

Dave Walden
Federal Aviation Administration

Robert Kebel
Airbus

Jim Crites
James M. Crites, LLC (formerly of Dallas Fort-Worth International Airport)

Brian Townsend
American Airlines

Mark Hopkins
Delta Air Lines, Inc.

David Surridge
American Airlines

Rob Lamond
National Business Aviation Association

Paul McDuffee
Insitu, Inc.

Rune Duke
Aircraft Owners and Pilots Association

John Reisinger
Jeppesen

Ilhan Ince
American Airlines

Dave Knorr
Federal Aviation Administration

Daniel Allen
FedEx Express

Steve Fulton
Sandel Avionics
Significant Contributor Award

The RTCA Significant Contributor Award recognizes individuals for very important and noteworthy contributions in their respective Special Committees.

Congratulations to RTCA Significant Contributors!

Kevin Bridges  
Federal Aviation Administration  
Mark Mutchler  
Federal Aviation Administration  
Tom Evans  
National Aeronautics and Space Administration  
Izabela Gheorghisor  
The MITRE Corporation  
Cedric D’Silva  
Thales  
Dung Nguyen  
The Boeing Company  
Mike Jackson  
Honeywell International, Inc.  
Frederic Beltrando  
Airbus  
Marc Charron  
NavCanada  
Ken Jones  
National Institute of Aerospace  
Santi Ibarz  
Airtel ATN  
Lars Suneborn  
Smart Card Alliance  
Walter Hamilton  
KD Technology Partners  
Samantha Smearcheck  
Calhoun Analytics  
Franck Campagna  
Airbus  
Scott McBride  
MI Technologies  
William Blake  
Garmin, Ltd.  
Peter Beutelman  
Rockwell Collins, Inc.  
Tim Totten  
United Parcel Service  
Francois Courbun  
Airbus  
Carsten Schwarzbach  
Lufthansa  
Erik Miller  
American Airlines  
Almira Ramadani  
Federal Aviation Administration
## EQUIPPING FOR THE FUTURE: GLOBAL AVIATION LEADERS ON TECHNOLOGY STANDARDS AND IMPLEMENTATION

**Moderator:** Lieutenant General Bob Durbin, Chief Operating Officer, Aerospace Industries Association

**Panelists:**
- David Batchelor, Head of International Affairs, SESAR Joint Undertaking
- Francois Delille, Director of Global Strategy for ATM and CNS Ground Systems, Thales
- Dr. Christopher Hegarty, Director of CNS Engineering & Spectrum, The MITRE Corporation
- Michele Merkle, Director, NAS Systems Engineering and Integration Office, FAA
- Christian Schleifer-Heingärtner, Secretary General of EUROCAE

During this session, the panel discussed processes that will allow for technological advancement while allowing regulators to maintain and rapidly develop robust standards.

Michele Merkle expounded on the idea that NextGen will be deemed successful based on the benefits it delivers to stakeholders in the airline industry, in the general aviation community, and among new entrants into the airspace, including UAS operators. “It’s important to remember that NextGen is not just an FAA or government initiative. It’s a joint government-industry initiative,” she said.

David Batchelor agreed with Michele about the importance of standardization, and shared how SESAR, while not a standards-making body, cooperates with both RTCA and EUROCAE to provide research and support the transition from research to standardization to implementation. “We have a very well-established cooperation arrangement with NextGen—with the FAA—and in a way, we use that also as a means to give visibility to each other about our respective plans so that we can try to collaborate and also feed what are often joint standardization activities between RTCA and EUROCAE,” David said.

Christian Schleifer-Heingärtner, noted that the coordination between American and European aviation leaders has been a boon for the industry on both sides of the Atlantic.
Minimum Aviation System Performance Standard for AMS(R)S Data and Voice Communications Supporting Required Communications Performance (RCP) and Required Surveillance Performance (RSP)

DO-343A, Minimum Aviation System Performance Standard for AMS(R)S Data and Voice Communications Supporting Required Communications Performance (RCP) and Required Surveillance Performance (RSP)
EUROCAE, a big question is validation of standards, and the joint work done with RTCA makes it that much easier to justify and validate the work that NextGen and SESAR are doing. “But,” he continued, “there are also some lessons learned, and we also see the environment is changing. We see for example that the question comes up again and again about validation of our standards. How do we validate before we implement it? Is it fit for the purpose? Is it fit for production?”

Those questions may dominate, but some in the industry, including Dr. Christopher Hegarty see the cooperation among SESAR, RTCA, and EUROCAE as an early positive indicator. And he says those indications are proven that much stronger each time a joint standard is produced and adopted. “They are being invoked by TSOs and ETSOs on both sides of the pond and around the world,” he said.

Francois Delille provided another perspective on the success of the standards created and adopted jointly and independently by RTCA and EUROCAE. While he remained positive overall, he felt there was still room for improvement in implementing standards worldwide. “Before we adopt a worldwide standard, we may want to ensure that there is an agreement on a timely and synchronized way to deploy.”

**IMPLEMENTING NEXTGEN PRIORITIES: AVIATION LEADERS ON THE NEXT STEPS**

**Moderator:** Trish Gilbert, Executive Vice President, National Air Traffic Controllers Association (NATCA)

**Panelists:**
- Captain Stephen M. Dickson, Senior Vice President, Flight Operations, Delta Air Lines, Inc.
- Pamela Gomez, NextGen Technical Advisor, FAA
- Dave Knorr, Division Manager for NextGen Systems Analysis and Modeling, FAA
- Captain Brian Townsend, Manager and Technical Pilot, Airspace Optimization, American Airlines
- Jesse Wijntjes, Data Communications Program Manager, FAA

**During this session, the panelists discussed the four focus areas of NextGen—DataComm, Multiple Runway Operations (MRO), Performance Based Navigation (PBN), and Surface and Data Sharing.**

Regarding multiple runway operations (MRO) and whether or not the program would be put aside in favor of other priorities, Pamela Gomez said that MRO was well-established as a priority for NextGen and will likely remain so. “One of the things NextGen did early was establish a multiple runway operations portfolio, so we had MRO activities very engrained in the FAA prior to actually establishing priorities,” she said. “So really, getting that
The panelists discussed aircraft metering and its importance to performance-based navigation (PBN).

Dan Allen explained the basic problem with implementing timing and spacing in the airspace, which lies in the fact that PBN is near complete reversal of the vector procedures that controllers have used for decades. “For over 50 years, the controller’s primary way of spacing and sequencing aircraft was this magical thing called a vector...Now we’re telling the controller ‘Don’t do that. Leave them on these controlled pro-

ceedures.’ And how do we do that? You have to time it,” he said.

When asked how to shift the culture of controllers and pilots to adjust to these new procedures, Bruce DeCleene recommended focusing on the values that airline pilots and air traffic controllers are asked to employ. “Values drive behaviors and that drives everything Dan described in terms of our decades of experience where we do delay absorption in the terminal area with vectoring onto an ILS. That’s how we do our business,” said Bruce.

Jeff Woods underscored the importance of holistic
thinking in implementing PBN and timing and supporting not only air traffic controllers and pilots, but also the system itself. “You have to have the ability to employ a tool, and at the same time sustain that tool and be able to address issues that we have with it because you’re talking about something that has to deal with a very dynamic situation every minute of the day. It’s always going to change,” said Jeff.

When asked how the avionics portion of the system is doing, Kirk Kolek said that there is progress being made in the technologies being implemented within the aircraft. “In a lot scheduled operations there is RTA capability now,” said Kirk, “but there is some discussion relative to performance and how the airplane can act and respond...collaborative specs and standards being written to help drive that uniformity is really going to help even on the RTA front.”

Steve Fulton reflected the sentiments of the rest of the panel in recommending continuing efforts to clarify standards. And in his experience as a pilot, he felt more could be done to make it easier for the human users of the system to understand temporal coordination in real time through improved tools and reporting. “There could be more graphical tools, better presentations, maybe a simple speed—you fly this speed, you get that,” he said. “These things are all going to be new, and the earlier we get started on these things, the more we’re going to learn, and the quicker we’ll get to the solution.”

“I really like that [the panelists] have a discussion about what’s going on and give us the opportunity to ask questions.”
RTCA, Inc. has teamed up with The MITRE Aviation Institute to offer high quality and relevant training for the aviation industry in understanding the requirements and parameters for avionics software development necessary to obtain FAA certification.

The two world class organizations are using their collective experience and expertise to provide training on the new standards and recommended practices contained in the DO-178C, Software Considerations in Airborne Systems and Equipment Certification.

In addition to the comprehensive course manual developed by the experts at The MITRE Aviation Institute, each training course attendee will receive the latest standards developed over a six-year period by RTCA Special Committee 205.

The course is led by instructors who will provide a thorough understanding of the requirements and the applicability of DO-178C; the fundamental techniques of software development considerations in airborne systems and equipment certification; and an introduction and overview of Software Tool Qualification Considerations, Formal Methods Supplement to DO-178C, Model-Based Development and Verification Supplement to DO-178C, and Object Oriented Technology and Related Techniques Supplement to DO-178C.

As an adjunct to DO-178C, this course will provide the background and scope on the four documents supporting DO-178C:

- DO-330, Software Tool Qualification Considerations
- DO-331, Model-Based Development and Verification Supplement to DO-178C and DO-278A
- DO-332, Object-Oriented Technology and Related Techniques Supplement to DO-178C and DO-278A
- DO-333, Formal Methods Supplement to DO-178C and DO-278A

Attendees will receive detailed instruction on DO-331 covering the objectives, activities, explanatory text and software life cycle data that should be applied when model-based development and verification are used as part of the software life cycle.

In addition, the training will cover the systems requirements linkage to the DO-178C and Supplement processes through an explanation of the interface to ARP 4754A, Guidelines for Development of Civil Aircraft and Systems.
DO-160G, ENVIRONMENTAL CONDITIONS AND TEST PROCEDURES FOR AIRBORNE EQUIPMENT, TRAINING COURSE

September 11-14 at WSU
December 12-15 at RTCA

RTCA, in partnership with Wichita State University’s National Institute for Aviation Research (WSU-NIAR), offers high quality training covering RTCA’s DO-160G, Environmental Conditions and Test Procedures for Airborne Equipment. The course will provide an understanding of the use of DO-160G and how it fits in with the greater picture of requirements, design, certification and TSOs.

Course participants will gain a clear and relevant understanding of the applicable FAA regulations, advisory material, certification procedures, design approaches/trade-offs, inspection and conformity requirements, as well as details of the necessary parts of a test plan, test report, compliance plan and compliance report. A strong focus is placed on the reduction of risk, cost and schedule throughout the design/certification process, by use of targeted design and increased first-pass success on design and testing. In addition to a comprehensive course manual, each training course attendee will receive a copy of RTCA’s DO-160G, supporting material, and will participate in real-world exercises applying the knowledge learned from the class.

DO-254, DESIGN ASSURANCE GUIDANCE FOR AIRBORNE ELECTRONIC HARDWARE, TRAINING COURSE

September 11-13 at RTCA
December 18-20 at RTCA

RTCA is hosting a three-day training course, tailored specifically to design/verification engineers and project/certification managers requiring DO-254 compliance.

This three-day course will:

• Provide an overview and application of RTCA DO-254, as defined by current FAA and EASA guidance in airborne electronic systems.

• Describe how to apply the DO-254 lifecycle and supporting processes; understand system safety assessments and the design assurance level (DAL); and set up a project correctly through proper planning and standards.

• Present techniques and writing requirements for electronic hardware, and how to optimize requirements for verification processes.

• Describe how to efficiently and effectively verify requirements with simulation and hardware tests.

• Address specific considerations for programmable logic devices (PLDs) such as FPGA/ASIC versus all electronics; commercial off-the-shelf (COTS) components usage; and tool assessment and qualification.

*Unless otherwise noted, all training courses will take place at RTCA Headquarters, located conveniently in downtown Washington, DC. For additional information, please visit www.rtca.org or email training@rtca.org.
The panelists of this session discussed ADS-B capabilities and the progress toward the US 2020 deadline of implementing enhanced airspace surveillance.

Bart Roberts began the conversation by discussing what needs to be accomplished and what challenges lie ahead in meeting the 2020 deadline for ADS-B implementation. “From an operator’s perspective and all of us who have large fleets recognize that this is going to be a challenge because of the mandate and the timeline that we have. It’s a reasonable timeline, but it’s a timeline that did not allow us to really take a lot of time to figure out how we were going to get this done,” he said.

From the general aviation perspective, ADS-B implementation requires that the industry makes more than a business case to convince end-users to comply with new standards, according to Melissa Rudinger. “If nothing else changes, we’re going to have 50 percent equipage by the 2020 deadline, and that’s not going to work,” she said.

From the avionics perspective, Carl Esposito told the audience that when asked by the NextGen Advisory Commit-
group, but he felt the 10-year timeline put in place went by much more quickly than most in the industry expected. Despite that, and some of the barriers the industry faced, he says capabilities are in place from a ground control perspective. “Hundreds of air traffic control towers now have automation that can see ADS-B if it’s equipped,” he said. “It’s on the display just like they’re seeing it, just like the regular target that’s on display. All of our centers are equipped with the technology, all of our TRACONs are equipped with the technology, and we’ve learned a lot.”

Dr. Michael Garcia said that satellite capability was also well on its way to full implementation, having celebrated the launch in January of the first 10 of more than 70 ADS-B satellites that will be in place by the 2020 deadline. “At this point, we’re getting about a billion ADS-B positions messages a month, which is pretty staggering, and it’s only going to grow from that point,” said Michael. “We see a lot of equipage all over the world, and it’s very different and dynamic.”

Joe Bertapelle described how the enhanced surveillance task group looked at where the benefits of ADS-B implementation would come from through the work of a number of subgroups and airlines. “We came down with a level setting of assumptions,” he said. “It’s the belief of the task group that we will get down closer to the 15/15 separation potential. Our recommendation is for the FAA to pursue space-based ADS-B in remote areas which we are defining as enhanced surveillance.”

**THE ENVIRONMENT AND NEXTGEN: ENVIRONMENTAL IMPACTS OF AVIATION**

**Moderator:** Margaret McKeough, Executive Vice President and Chief Operating Officer, Metropolitan Washington Airport Authority (MWAA)

**Panelists:**
- Carl Burleson, Deputy Assistant Administrator of Policy, International Affairs, and Environment, FAA
- Curtis Holsclaw, Director of Energy and the Environment, FAA
- Takafulmi Nakada, Director, Surveillance and Communications, Electronic Navigation Research Institute (ENRI)
- Gary Young, Director of Airport Affairs, City of College Park, GA
- Nancy Young, Vice President of Environmental Affairs, Airlines for America (A4A)

During this session, the panelists discussed the impact of the aviation industry on the environment. They talked about the steps the industry has taken to mitigate the environmental impacts of aviation.

Nancy Young said the industry is on track to achieve its goals, having increased fuel efficiency, reduced noise, and introduced alternative fuels throughout the air and ground systems. “Talking about fuel efficiency, for example, U.S. Airlines improved their fuel efficiency 120 percent since 1978,” said Nancy. “So what? That means we’ve saved 4 billion metric tons of carbon dioxide—that’s like taking 23 million cars off the road each of those years.”

Others on the panel agreed that steps taken by the FAA and industry leaders have already begun to take effect. Among these was Curtis Holsclaw who says that the Administration’s CLENE program is already beginning to pay off. “The aim of the program is to take technologies that NASA has developed with industry participation and try to accelerate those into commercialization,” he said. “We’re already seeing some of the technologies that have been developed make their way into aircraft that are rolling off the production line. And that means all those benefits are starting to accrue to the communities around airports.”
Takafumi Nakada says noise pollution, which is usually chief among environmental complaints around airports in the United States, is a new issue for Japanese airports and airlines primarily because other advancements have concentrated aircraft noise over smaller areas. “The [overall] noise level decreased significantly, but the concentration of noise is increasing,” Takafumi said.

This concentration of noise pollution is expected to be the biggest environmental impact of the industry in the near term and into the future as ADS-B and other advancements concentrate airplane traffic over narrower bands of airspace. Gary Young said that noise from airplanes won’t every disappear completely, so the industry needs to help local communities understand the other benefits that come with allowing airports in the community. “In the conversations that go forward with the communities, there has to be a way—there should be a way—of making sure that there is an understanding and every opportunity that is possible at the community level to see that there are benefits [to airports], that it improves the opportunities for our local economies to grow,” he said. “In rooms like this, there is a clear understanding of the benefits. At the community level, it’s the person sitting under that flight path who may not understand.”

“We’re in a dynamic state now, and changes are occurring as we’re speaking...the urgency for me to get the message out is important.”

— Robert Nichols
Federal Aviation Administration
COMPREHENSIVE FAA BILL: AVIATION LEADERS ON FAA REAUTHORIZATION

Moderator: Will Ris, former Senior Vice President and a noted aviation expert, American Airlines
Panelists:
- Edward M. Bolen, President and CEO, National Business Aviation Association (NBAA)
- James Burnley IV, Chairman, Eno Center for Transportation
- Nick Calio, President and CEO, Airlines for America (A4A)
- James W. Coon, Senior Vice President of Government Affairs and Advocacy, Aircraft Owners and Pilots Association (AOPA)
- Dr. Gerald L. Dillingham, Director of Civil Aviation Issues, Government Accountability Office (GAO)
- Paul Rinaldi, President, National Air Traffic Controllers Association (NATCA)

With members on both sides of the argument for and against FAA restructuring, the panelists shared their stances and argued their positions in regard to the reauthorization bill in Congress.

Jim Burnley began the discussion with an impassioned argument for FAA restructuring, saying that technological advances in other parts of the world have shown current US standards to be behind the times, with proof being the paper strips that air traffic controllers are still using to track incoming flights. “If the current FAA determinant to replace them stays on time...in 2028, these strips will disappear from the 89 most congested air traffic control facilities,” he said. “And if one of Paul’s members has the misfortune of being facility 90, or 91, or 92, there’s no end in sight to this.”

Reflecting this sentiment, Nick Calio said the time for change was 20 years ago when it was first recommended by then President, Bill Clinton. “We have frozen ourselves in place because of special interest opposition to any kind of change whatsoever,” said Nick.

James Coon said he’s been around this debate for decades and has found that it’s important to have a level of consensus in crafting new rules and regulations for the industry, if only to ensure that any new rules can pass hurdles in Congress.

Dr. Dillingham urged cautious optimism from the industry as NextGen efforts get underway. Despite the late start, he says his office has found that some progress has been made toward modernization efforts, which he says is positive given the complexity of the US NAS and air traffic control operations. “My organization is not in the habit of defending the FAA, but some of the work that we’ve done..."
DO-246E, GNSS-Based Precision Approach Local Area Augmentation System (LAAS) Signal-in-Space Interface Control Document (ICD)

DO-253D, Minimum Operational Performance Standards for GPS Local Area Augmentation System Airborne Equipment

RTCA GLOBAL AVIATION SYMPOSIUM SESSIONS
The Symposium Sessions can also be viewed online. Visit www.symposium.rtca.org and click on the Agenda Page.

INDUSTRY LUNCHEON: TRANSSTEM ACADEMY DIRECTOR AND STUDENTS SHARE STEM SUCCESSES

Highlighting RTCA’s interests in encouraging young people to select careers in aviation and Science, Technology, Engineering & Math (STEM), the Industry Luncheon showcased an exemplary program based in Washington, DC.

Aero Club Foundation of Washington President, Yvette Rose, spoke with TransSTEM Academy Director Cheryl Rodgers about the program’s successes and what students have accomplished since graduating from the academy.

The TransSTEM Academy, formerly TransTech, was founded in 1991 by Shirley McCall as the first transportation studies program in Washington, D.C. According to the Academy’s website, TransSTEM has provided a specialized education to students in the fields of transportation, aviation, computer sciences, engineering, and other science, technology, engineering, and mathematics disciplines for more than 25 years. More than 750 students have graduated from the Academy with more than 85 percent of students going on to attend a 2- or 4-year college or university.

When asked why she started working with the TransSTEM Academy, Cheryl said she had been working as a consultant with Shirley McCall and wanted to get more involved in improving education among underrepresented groups. “I got tired of hearing about the low reading and math scores in the lost generation, so I thought being from the same community, I could come back and share a wealth of knowledge, does not necessarily support the idea that nothing has been done—that $7 billion has been wasted,” he said. No one is really satisfied with the pace, especially in the first five or ten years of modernization, but what we’ve found is that there is progress being made. There are changes in the system.”

All members of the panel could agree that safety is the highest priority throughout the modernization process, and Paul Rinaldi said that modernization would enhance rather than imperil safety in the NAS. He cited a study of standards in other countries around the world showing that modernizing air traffic control systems has no negative impacts on safety. “History will tell you when you look at the other civilized countries that pulled out their operation away from the regulatory and safety function, that safety remained the same or was enhanced,” said Paul.

However, Ed Bolen cautioned against comparing the evolving safety standards in other countries against those of the US, saying that no other country has yet surpassed the safety levels set by the United States. “The United States has the largest, safest, most complex, most diverse, most efficient air transportation system in the world,” he said. “And I think that baseline needs to be understood and established.”

Left to Right: Yvette Rose, Cheryl Rodgers, Erisele Gonzalez, Lakisha Davis-Small
network, help them with advocating for themselves and investing in themselves,” she said.

Joining Cheryl on stage were TransSTEM graduates Erisele Gonzalez and Lakisha Davis-Small who shared their experiences with the program and how it had helped them in their careers. Both expressed immense gratitude for the program, and for Shirley McCall herself, in helping them to begin their careers in the aviation industry.

“They showed me how to be persistent,” Erisele told the audience. “All the teachers in that program were really wonderful at keeping all the kids on the right path and were always interested in what we wanted, what we were good at, and focusing in on our strengths.”

“The TransSTEM Academy basically changed my life,” Lakisha said of the program. “I was an eleventh grade student when I was offered a position to work in the summer for the FAA. And through the Academy I learned work-life skills, readiness skills, computer skills, etiquette, and how to conduct yourself in a professional setting—I owe Ms. McCall so much for that.”

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**CYBERSECURITY: LEADERS DISCUSS INDUSTRY STANDARDS**

**Moderator:** Kelle Wendling, Vice President and General Manager, Missions Networks, Harris Corporation

**Panelists:**
- Captain Joe DePete, First Vice President, Air Line Pilots Association, International (ALPA)
- Jens Hennig, Vice President, Operations, General Aviation Manufacturers Association (GAMA)
- Steven Hofmann, Senior Technology Advisor to NextGen, Department of Defense
- Dr. Daniel Johnson, Cybersecurity Fellow, Honeywell Aerospace
- Jeff Snyder, Vice President of Cyber Programs, Raytheon

Defining cybersecurity and identifying what’s most relevant for aviation in the cybersecurity realm, Dr. Daniel Johnson pinpointed safety as a key element. He also iterated that the industry is actually at an advantage in being behind technologically compared to other industries. “I hate to say this is an advantage, but we have an advantage in that we’re old technology. We haven’t connected our aircraft out to the world except in limited fashions. But the world wants to be connected to us, and we want to be connected to it. So we have the opportunity here to do it right,” he said.

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Left to Right: Jeff Snyder, Joe DePete, Dan Johnson, Steve Hofmann, Jens Hennig, Kelle Wendling
COMMERCIAL SPACE: THE FUTURE OF THE INDUSTRY

Captain Joe DePete said that connectivity could prove troublesome, but he sees a future where industry collaboration and connectivity provides new layers of support technology for pilots while safeguarding that technology with additional industry-approved cybersecurity enhancements. “Today I see a very positive collaborative effort towards [connectivity] this, and a commitment on everybody’s part to also come to a standards agreement,” said Joe.

Despite the collaborative environment that is developing thanks to connectivity issues, Steve Hofmann warned that airplanes do not necessarily need to be connected to the internet to become infected with malware, and that the industry needs to be making incremental steps at all levels to accomplish its goals. “Everything is actually in some way connected. Even disconnected things are connected when we load data, when we do software patches, those kinds of things,” he said.

Jeff Snyder told the group that industry culture, above all, is the key to limiting cybersecurity threats within a large ecosystem like the NAS. As an example, he shared that Raytheon’s cybersecurity program was modeled on one similar to FedEx, which held culture, above all other features, as key to maintaining an organization’s cybersecurity health. “What you’ll find in industry is if you use a traditional software scanning tool, you may identify 30 percent of the exploits,” said Jeff. “That leaves a huge attack surface…but when we evolve to a system-to-system architecture, you’re only as strong as your weakest link.”

Jens Hennig impressed upon the audience the importance of trusting and incorporating current maintenance procedures into standards, to ensure organizational cultures take into account the methods recommended by manufacturers to increase safety in the near-term.

“Those additional procedures you see manufacturers putting out there,” he said, “are instructions to the operator for how to maintain the maintenance computer. If you have some kind of other system that interfaces with the aircraft, there are additional procedures beyond the ICA that are now…a part of the special condition. So there’s the future state, but there’s also the very pragmatic near-term.”

Panelists shared their thoughts on how the aviation industry, the FAA and the commercial space industry can cooperate to address emerging needs in the National Airspace System (NAS).

Kevin Hatton provided the first perspective on the integration of commercial space, which he expects to become a daily presence in the NAS in the future. “We’re looking at three launches by July as a short-term goal,” he said. “Ultimately [our] aspirational goal is to be able to launch, plan, refuel, and launch again within 24 hours, the same vehicle.”
Tim Logan said his company’s goals reflect those of SpaceX, in that they hope to open space flight to the public. But in addition to daily flights, the Virgin Galactic system utilizes existing airplane technology to enable its space flight technology. As a result, it will have a unique presence in the airspace. “Our space flight system consists of an aircraft that carries our spaceship up to about 50,000 feet, where it is dropped, and a rocket is ignited and continues up about 80 kilometers.”

Eric Stallmer highlighted the excitement around the industry. He says his organization has grown to encompass the spaceflight industry internationally, including space ports, launch companies, and many others that have a stake in the emerging space industry. As a result, he’s seen first-hand the paradigm shift from high-cost space programs, to reusable, cheaper-to-launch vehicles produced by launch companies. “When you can reuse a launch vehicle, which they [launch companies] have successfully demonstrated numerous times, it dramatically brings down the cost to launch and to access space. And that opens up the ideas of what’s really possible and what you can do in space. So ideas that people had of these huge satellites that would last 10 years—that’s all been replaced with throw-away satellites that you can build in less than a week.”

Heidi Williams said that her sector of the industry is eager to open a dialogue with the commercial space industry, the FAA, and the entire aviation industry to discuss access issues and prioritization to ensure safety in the NAS. Bill Davis told the audience that above all, the FAA seeks to increase the value of the NAS for all stakeholders while resolving issues of interoperability with enterprise-wide solutions. “We see three competing business models where it started as typically the horizontal aviation, and the air traffic industry is exceedingly good at moving airplanes from airport to airport...Now we have the ability to take that and multiply it many-fold as we’re able to take on the challenge of introducing UAS [unmanned aerial systems] and commercial space,” he said.

Mike Romanowski said that his organization is unique among others in the FAA, in that it has to be extraordinarily nimble to keep pace with the rapid advances in the industry. However, he said there are necessary safeguards in place to slow the pace of that innovation to ensure that all products brought to the market are safe for inclusion in the NAS. “We have to work carefully with the industry and the partners across our agency to make sure all the issues are identified and on the table, and that we’ve got solutions identified.”
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We hope the 2017 Global Aviation Symposium was informative and worthwhile. You helped make this event a great success, and your enthusiasm helped to make our time together productive and enlightening. We look forward to seeing you next year!

—Sincerely,
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