THE STATE OF AVIATION SAFETY

(115–36)

HEARING

BEFORE THE

SUBCOMMITTEE ON
AVIATION

OF THE

COMMITTEE ON TRANSPORTATION AND INFRASTRUCTURE HOUSE OF REPRESENTATIVES

ONE HUNDRED FIFTEENTH CONGRESS

SECOND SESSION

FEBRUARY 27, 2018

Printed for the use of the
Committee on Transportation and Infrastructure

Available online at: https://www.govinfo.gov/committee/house-transportation?path=/browsecommittee/chamber/house/committee/transportation

U.S. GOVERNMENT PUBLISHING OFFICE
31–404 PDF WASHINGTON : 2018

COMMITTEE ON TRANSPORTATION AND INFRASTRUCTURE

BILL SHUSTER, Pennsylvania, *Chairman*

DON YOUNG, Alaska
JOHN J. DUNCAN, JR., Tennessee, *Vice Chair*
FRANK A. LOBIONDO, New Jersey
SAM GRAVES, Missouri
DUNCAN HUNTER, California
ERIC A. "RICK" CRAWFORD, Arkansas
LOU BARLETTA, Pennsylvania
BLAKE FARENTHOLD, Texas
BOB GIBBS, Ohio
DANIEL WEBSTER, Florida
JEFF DENHAM, California
THOMAS MASSIE, Kentucky
MARK MEADOWS, North Carolina
SCOTT PERRY, Pennsylvania
RODNEY DAVIS, Illinois
MARK SANFORD, South Carolina
ROB WOODALL, Georgia
TODD ROKITA, Indiana
JOHN KATKO, New York
BRIAN BABIN, Texas
GARRET GRAVES, Louisiana
BARBARA COMSTOCK, Virginia
DAVID ROUZER, North Carolina
MIKE BOST, Illinois
RANDY K. WEBER, SR., Texas
DOUG LAMALFA, California
BRUCE WESTERMAN, Arkansas
LLOYD SMUCKER, Pennsylvania
PAUL MITCHELL, Michigan
JOHN J. FASO, New York
A. DREW FERGUSON IV, Georgia
BRIAN J. MAST, Florida
JASON LEWIS, Minnesota
PETER A. DEFAZIO, Oregon
ELEANOR HOLMES NORTON, District of Columbia
EDDIE BERNICE JOHNSON, Texas
ELIJAH E. CUMMINGS, Maryland
RICK LARSEN, Washington
MICHAEL E. CAPUANO, Massachusetts
GRACE F. NAPOLITANO, California
DANIEL LIPINSKI, Illinois
STEVE COHEN, Tennessee
ALBIO SIRES, New Jersey
JOHN GARAMENDI, California
HENRY C. "HANK" JOHNSON, JR., Georgia
ANDRÉ CARSON, Indiana
RICHARD M. NOLAN, Minnesota
DINA TITUS, Nevada
SEAN PATRICK MALONEY, New York
ELIZABETH H. ESTY, Connecticut, Vice Ranking Member
LOIS FRANKEL, Florida
CHERI BUSTOS, Illinois
JARED HUFFMAN, California
JULIA BROWNLEY, California
FREDERICA S. WILSON, Florida
DONALD M. PAYNE, JR., New Jersey
ALAN S. LOWENTHAL, California
BRENDA L. LAWRENCE, Michigan
MARK DESAULNIER, California
STACEY E. PLASKETT, Virgin Islands

SUBCOMMITTEE ON AVIATION

FRANK A. LOBIONDO, New Jersey, *Chairman*

DON YOUNG, Alaska
JOHN J. DUNCAN, JR., Tennessee
SAM GRAVES, Missouri
DUNCAN HUNTER, California
BLAKE FARENTHOLD, Texas
BOB GIBBS, Ohio
DANIEL WEBSTER, Florida
JEFF DENHAM, California
THOMAS MASSIE, Kentucky
MARK MEADOWS, North Carolina
SCOTT PERRY, Pennsylvania
RODNEY DAVIS, Illinois
MARK SANFORD, South Carolina
ROB WOODALL, Georgia
TODD ROKITA, Indiana
BARBARA COMSTOCK, Virginia
DOUG LAMALFA, California
BRUCE WESTERMAN, Arkansas
PAUL MITCHELL, Michigan, *Vice Chair*
JASON LEWIS, Minnesota
BILL SHUSTER, Pennsylvania *(Ex Officio)*
RICK LARSEN, Washington
EDDIE BERNICE JOHNSON, Texas
DANIEL LIPINSKI, Illinois
ANDRÉ CARSON, Indiana
CHERI BUSTOS, Illinois
ELEANOR HOLMES NORTON, District of Columbia
DINA TITUS, Nevada
SEAN PATRICK MALONEY, New York
JULIA BROWNLEY, California
DONALD M. PAYNE, JR., New Jersey
BRENDA L. LAWRENCE, Michigan
MICHAEL E. CAPUANO, Massachusetts
GRACE F. NAPOLITANO, California
STEVE COHEN, Tennessee
HENRY C. "HANK" JOHNSON, JR., Georgia
RICHARD M. NOLAN, Minnesota
PETER A. DEFAZIO, Oregon *(Ex Officio)*

CONTENTS

[1] This 91-page accident report can be found online at the National Transportation Safety Board's website at https://ntsb.gov/investigations/AccidentReports/Reports/aar1801.pdf.

Page

ADDITIONS TO THE RECORD

Committee on Transportation and Infrastructure
U.S. House of Representatives
Washington DC 20515

Bill Shuster
Chairman
Mathew M. Sturges
Staff Director

Peter A. DeFazio
Ranking Member
Katherine W. Dedrick
Democratic Staff Director

February 23, 2018

SUMMARY OF SUBJECT MATTER

TO:	Members, Subcommittee on Aviation
FROM:	Staff, Subcommittee on Aviation
RE:	Hearing on "The State of Aviation Safety"

PURPOSE

On Tuesday, February 27, 2018, at 10:00 a.m., in 2167 Rayburn House Office Building, Members of the Subcommittee on Aviation will participate in a hearing to receive an update on the safety of the National Aviation System, including progress made and challenges still to be addressed. The Subcommittee will hear from representatives of the Federal Aviation Administration (FAA), National Aeronautics and Space Administration (NASA), National Transportation Safety Board (NTSB), Office of the Inspector General of the Department of Transportation (DOT IG), and Air Line Pilots Association (ALPA).

BACKGROUND

The National Airspace System currently enjoys a very high level of safety due to the sustained efforts of the aviation community, including the FAA, Congress, labor, and industry.

Commercial Aviation

At the beginning of the 21st century, U.S. airline industry and passenger traffic levels were severely impacted by the September 11th terrorist attacks and subsequent economic recessions. However, since 2009, commercial aircraft operations have stabilized, demand for air travel has increased annually, and airlines have returned to profitability. Despite the increased use of the National Airspace System, commercial aviation safety has improved as a result of collaborative efforts between government, labor, and industry.

The NTSB, the federal agency responsible for investigating transportation accidents and issuing safety recommendations without regard to cost, issued 54 recommendations and deployed teams to investigate more than 200 domestic and international accidents in 2016.[1] That same year, there were 31 accidents involving scheduled U.S. air carriers, none of which resulted

[1]National Transportation Safety Board "National Transportation Safety Board 2016 Annual Report to Congress." https://www.ntsb.gov/about/reports/Documents/NTSB-2016-Annual-Report.pdf

in fatalities or were categorized by the NTSB as a "major accident."[2] While the total number of U.S. commercial air carrier accidents increased in 2016, the increase was primarily made up of accidents classified by the NTSB as "damage" (meaning accidents in which there were no fatalities or serious injuries, but there was substantial damage to an aircraft).[3] In 2016, accidents classified by NTSB as "damage" doubled compared to 2015, while the number of accidents classified as "injury" (meaning a nonfatal accident with at least one serious injury and without substantial damage to a Part 121 aircraft) dropped substantially. The NTSB's "damage" category includes abnormal runway contact, ground handling and aircraft servicing events, landing gear collapses, and ground collisions.

The last major fatal U.S. commercial passenger airline accident occurred in 2009 when Colgan Flight 3407 crashed near Buffalo, NY, killing all onboard and resulting in one fatality on the ground.[4] In the wake of this accident, Congress mandated a number of safety reforms, including flight crew safety requirements. The flight crew safety requirements include new flight hour training requirements, new technical skills requirements, and new flight and duty time requirements for commercial pilots. The FAA has implemented most of these reforms, however progress has been slow on the remaining mandates, including the pilot records database intended to centralize information relating to pilot training performance.

General Aviation

The United States is home to a large and diverse general aviation community that includes over 220,000 aircraft and approximately 500,000 general aviation pilots.[5] Traditionally, this sector of aviation has had the highest number of accidents, injuries, and fatalities. While general aviation safety has improved in recent years, in fiscal year 2016 there were still 213 fatal accidents with 379 fatalities. As a result, the FAA, aviation industry, and Congress have made efforts to improve general aviation safety over the past decade. These efforts include streamlining certification processes, revising the third class medical process, and a number of collaborative initiatives undertaken by industry and the FAA. For example, the FAA recently implemented a new policy, Non-Required Safety Enhancing Equipment (NORSEE), which streamlines the process for general aviation operators to install non-required safety equipment on their aircraft.[6]

---

[2] NTSB classifies accidents in categories of "major", "serious", "injury", or "damage." A "major" accident is one that meets any of the following three conditions: the accident resulted in the destruction of a scheduled air carrier aircraft (part 121 aircraft), multiple fatalities, or single fatality along with a "substantially damaged" part 121 aircraft. A "serious" accident is one that results in a single one fatality without substantial damage to a part 121 aircraft or that results in a single serious injury with substantial damage to a part 121 aircraft. One accident in 2016 was classified as "serious." "2016 preliminary aviation statistics" Table 2.
https://www.ntsb.gov/investigations/data/Pages/aviation_stats.aspx

[3] "2016 preliminary aviation statistics" Table 2. https://www.ntsb.gov/investigations/data/Pages/aviation_stats.aspx

[4] In July 2013, Asiana Flight 214 crashed while landing at San Francisco International Airport, killing three passengers and injuring 187 others. In August 2013, UPS Flight 1354 crash-landed short of the runway at Birmingham–Shuttlesworth International Airport, killing the two pilots onboard. These accidents are not classified as U.S. commercial passenger airline accidents as they involved a foreign air carrier or a cargo flight, respectively.

[5] Federal Aviation Administration. "Fact Sheet – General Aviation Safety"
https://www.faa.gov/news/fact_sheets/news_story.cfm?newsId=21274

[6] Ibid.

While the number of general aviation fatalities has decreased over the past decade, there are still safety challenges and concerns within the general aviation community. Periodically, the NTSB issues its "Most Wanted List" of transportation safety improvements they believe to be priorities. Safety improvements related to general aviation have been included on the list for the last seven years. According to the NTSB, more than half of general aviation accidents are the result of loss of control, resulting in 1,194 fatalities between 2008 to 2014.[7] The FAA and the NTSB have held multiple safety forums, conducted safety education campaigns, and the FAA has established working groups with industry to discuss what steps can be taken to address this safety concern.

The NTSB has also investigated several high profile hot air balloon accidents, including one in Lockhart, Texas that killed all 15 passengers and the pilot. The NTSB found that the pilot of this hot air balloon had a "pattern of poor decision-making" and that his medical conditions and medications impaired his decision-making skills.[8] As a result of this accident, the NTSB raised concerns with the FAA's oversight of commercial balloon operators and recommended the FAA eliminate the second class medical exemption for such operators.[9]

FAA's Safety Oversight

The FAA is responsible for overseeing the safety of our Nation's civil aviation system. To carry out this responsibility, the FAA issues rules and regulations to promote the safety of the flying public, and regulates airlines, pilots (commercial and general aviation), flight attendants, mechanics, charter operators, repair stations, manufacturers, and others. Many of these regulations are in response to Congressional direction. In addition to issuing regulations, the FAA conducts regular and continuous oversight of all aspects of the aviation industry. Through inspections and enforcement actions, the FAA ensures that its safety standards are being met.

In 1998, the FAA launched an initiative known as "Safer Skies," which was intended to reduce fatal accidents by 2007.[10] To achieve this goal, the FAA established the Commercial Aviation Safety Team (CAST) and the General Aviation Joint Steering Committee (GA JSC).[11] CAST is comprised of representatives from the FAA, NASA, and industry stakeholders, and works to reduce commercial aviation fatality risks through data collection and analysis. As part of this effort, the FAA and NASA have the goal of transitioning to a "prognostic safety analysis".[12] As the aviation system safety rates have greatly improved over the decades, CAST is looking to shift its safety analysis from the traditional "diagnostic approach of examining

---

[7] According to the FAA, "loss of control" accident involves an unintended departure of an aircraft from controlled flight. "Fly Safe: Prevention of Loss of Control Accidents" Sept 27, 2016. https://www.faa.gov/news/updates/?newsId=86586 and NTSB "Prevent Loss of Control in Flight in General Aviation" https://www.ntsb.gov/safety/mwl/Pages/mwl5-2017-18.aspx

[8] NTSB "Poor Piloting Decisions, Lack of Medical Requirements, Led to Fatal Texas Balloon Crash" https://www.ntsb.gov/news/press-releases/Pages/PR-20171017.aspx

[9] Ibid.

[10] "Fact Sheet – Safer Skies," March 26, 2001. https://www.faa.gov/news/fact_sheets/news_story.cfm?print=go&contentKey=3263

[11] Ibid.

[12] "Fact Sheet – Commercial Aviation Safety Team" April 12, 2016 https://www.faa.gov/news/fact_sheets/news_story.cfm?newsid=18178

accidents after-the-fact, to a more proactive safety trend analysis.[13] Between 1998 and 2008, the fatality risk for commercial aviation in the United States fell by 83 percent.[14]

The GA JSC "works to improve general aviation safety through data-driven risk reduction efforts focused on education, training, and enabling new equipment in general aviation aircraft."[15] The GA JSC, which is also comprised of representatives from government and industry, utilizes a consensus-based approach and safety data analysis to develop strategies for the reduction of fatal general aviation accidents.[16] The present goal of the GA JSC is to reduce the general aviation fatal accident rate by 10 percent from 2008 to 2018.[17]

Department of Transportation Inspector General Reports

In recent safety audits, the DOT IG has raised concerns with FAA's oversight in several safety areas, including the following:

- The FAA is responsible for ensuring that all aircraft are appropriately maintained, which includes oversight of suspected unapproved parts (SUPs) in the aviation system. The DOT IG conducted an audit and found that the FAA's oversight of SUPs was lacking due to weaknesses in record keeping and "lack of management control," casting doubt on whether the number of SUPs was being accurately reported. [18] The DOT IG issued 11 recommendations to the FAA to improve its oversight of SUPs.
- In 2015, the DOT IG reviewed FAA's efforts in establishing the pilot records' database. As a result of that review, the DOT IG raised concerns over the delays in establishing the database and FAA's failure to make key decisions on how to incorporate records and database access.[19]
- The *FAA Modernization and Reform Act of 2012* (P.L. 112-95) directed the FAA to issue a rule on a variety of operational safety requirements for helicopter emergency medical service (HEMS) operations. In 2015, the DOT IG assessed the FAA's implementation of this final rule.[20] The DOT IG found that the FAA needed to update "key oversight policies" and gather "meaningful" safety data in order to identify trends.[21]
- More recently, the DOT IG reviewed the FAA's air traffic controller hiring process in response to concerns with the changes the FAA had implemented. In its audit, the

[13] Ibid.
[14] Commercial Aviation Safety Team. "Homepage." http://www.cast-safety.org
[15] General Aviation Joint Steering Committee. "About Us." http://www.gajsc.org/about-us/
[16] Ibid.
[17] Ibid.
[18] Inspector General of Department of Transportation. "Enhancements Are Needed to FAA's Oversight of the Suspected Unapproved Parts Program" May 30, 2017. https://www.oig.dot.gov/library-item/35715
[19] Inspector General of Department of Transportation "FAA Delays in Establishing a Pilot Records Database Limit Air Carriers' Access to Background Information." August 20, 2015. https://www.oig.dot.gov/library-item/32653
[20] Inspector General of Department of Transportation. "Delays in Meeting Statutory Requirements and Oversight Challenges Reduce FAA's Opportunities To Enhance HEMS Safety" April 8, 2015. https://www.oig.dot.gov/library-item/32450
[21] Ibid.

DOT IG found that the FAA had not effectively implemented the new hiring process, which resulted in hiring delays.[22]

Congressional Oversight and the FAA Safety, Security and Extension Act of 2016

The most recent extension of the FAA's authorization, the *FAA Safety, Security and Extension Act of 2016* (*2016 Extension Act,* P.L. 114-190,), included a number of time sensitive and safety-critical mandates and reforms. For example, the *2016 Extension Act* addressed issues relating to commercial airline and air ambulance safety, pilot training, controller staffing, repair station oversight, and aviation cybersecurity.

In the past several years, there have been a number of high profile air ambulance crashes where post-crash fires resulted in severe injuries and fatalities. In response to this, the *2016 Extension Act* directed the FAA to evaluate and update as necessary the standards for crash-resistant fuel systems on rotorcraft. The *2016 Extension Act* also set a deadline for implementation of the pilot record database originally required under the *Airline Safety and Federal Aviation Administration Extension Act of 2010* (P.L. 111-216). The FAA has since missed this deadline. Additionally, the *2016 Extension Act* revised the FAA's hiring process for air traffic controllers, an area where the FAA had failed to meet its goals for several years, resulting in nationwide staffing level concerns. Finally, the law includes reforms to the FAA's risk-based oversight of domestic and foreign repair stations and requires the FAA to complete a comprehensive and strategic framework for aviation cybersecurity. The Committee continues to monitor the FAA's progress in implementing these and other mandates.

Recent Safety Concerns

Runway Safety

In the last year, there have been a number of high profile near misses at U.S. airports as a result of aircraft attempting to land on an incorrect runway or on a taxiway. For example, at San Francisco International Airport (SFO), there were three near misses within the span of six months. On July 7, 2017, Air Canada Flight 759 nearly landed on a taxiway instead of the runway at SFO. During its nighttime visual approach, Flight 759 erroneously lined up to land on a taxiway on which four passenger planes were operating instead of the adjacent runway. Before landing, the flight crew aborted the landing attempt and self-initiated a "go around," missing the planes on the taxiway; the direction from air traffic control to initiate a "go around" came a few seconds later. The NTSB launched an investigation into the incident and found that at its lowest point, Flight 759 had only 26 feet of separation from one of the passenger aircraft on the taxiway.[23]

A few months later, on October 21, 2017, another Air Canada flight that was on the approach at SFO was instructed by air traffic control to "go-around" as it was unclear

[22] Inspector General of Department of Transportation "While FAA Took Steps Intended To Improve Its Controller Hiring Process, the Agency Did Not Effectively Implement Its New Policies" February 15, 2017 https://www.oig.dot.gov/library-item/35516

[23] https://www.ntsb.gov/investigations/Pages/DCA17IA148.aspx

whether a recently arrived aircraft had fully cleared the runway. However, the Air Canada flight did not respond and landed on the runway, which radar ultimately showed was clear of the previously arrived aircraft. According to pilots of the Air Canada flight, they had encountered radio issues and had not heard the "go around" direction from air traffic control.[24] Lastly, on January 9, 2018, an Aeromexico flight at SFO lined up on an incorrect runway that already had an aircraft on it. Air traffic controllers noticed the issue and directed the Aeromexico flight to "go around." The flight landed safely on its second landing attempt.[25]

Crash Resistant Fuel Systems on Helicopters

Although the overall rate of fatal helicopter accidents has decreased in recent years, a number of high profile air ambulance fatal crashes have raised attention to air ambulance safety. In particular, two accidents[26] for which the NTSB completed safety reports found that occupants experienced survivable impact forces, but post-crash fires caused additional injuries and fatalities.[27] The NTSB has issued several recommendations related to the installation of crash-resistant fuel systems on rotorcraft in response to these and other accidents. As a result of this, and the aforementioned legislative requirement in the *2016 Extension* Act, the FAA established the Rotorcraft Occupant Safety Working Group and tasked it with addressing issues relating to post-crash fires and rotor occupant safety in general.

UAS Collisions

Unmanned aircraft system (UAS) operations are growing at an exponential rate within the National Airspace System, particularly as a result of decreased costs and the establishment of the part 107 regulatory regime. While UASs offer exciting and innovative opportunities, recent research and incidents have raised concerns about the safety risks associated with their operation. A number of incidents in the United States and Canada have been reported in which a UAS struck or nearly struck manned aircraft. On February 14, 2018, it was reported that a Robinson R22 helicopter crashed near Charleston, South Carolina while taking evasive action to avoid hitting a UAS. While still under investigation, it is possible that this represents the first manned aircraft accident directly attributable to a UAS.[28]

---

[24] https://www.mercurynews.com/2017/10/23/again-faa-investigates-another-air-canada-runway-mix-up-at-sfo/
[25] https://www.cbsnews.com/news/aeromexico-plane-nearly-lands-wrong-runway-san-francisco-international-airport/
[26] The Subcommittee is aware that there are several helicopter crashes where there are reports of a post-crash fires, however the NTSB has not released final reports on the crashes.
[27] "National Transportation Safety Board 2016 Annual Report to Congress." p. 14 https://www.ntsb.gov/about/reports/Documents/NTSB-2016-Annual-Report.pdf
[28] Alan Levin, "Drone suspected in helicopter crash landing in South Carolina," *Insurance Journal*, February 16, 2018. https://www.insurancejournal.com/news/southeast/2018/02/16/480807.htm

WITNESS LIST

Mr. Ali Bahrami
Associate Administrator for Aviation Safety
Federal Aviation Administration

Mr. Akbar Sultan
Deputy Director of Airspace Operations and Safety Programs
National Aeronautics and Space Administration

Mr. John DeLisi
Director of the Office of Aviation Safety
National Transportation Safety Board

Mr. Matthew Hampton
Assistant Inspector General for Aviation Audits
Office of the Inspector General of the U.S. Department of Transportation

Captain Tim Canoll
President
Airline Pilots Association, International

THE STATE OF AVIATION SAFETY

TUESDAY, FEBRUARY 27, 2018

HOUSE OF REPRESENTATIVES,
SUBCOMMITTEE ON AVIATION,
COMMITTEE ON TRANSPORTATION AND INFRASTRUCTURE,
Washington, DC.

The subcommittee met, pursuant to notice, at 10:03 a.m. in room 2167, Rayburn House Office Building, Hon. Frank A. LoBiondo (Chairman of the subcommittee) presiding.

Mr. LOBIONDO. Good morning. The subcommittee will come to order. And, without objection, the Chair is authorized to declare a recess at any time. And I ask unanimous consent that members not on the subcommittee be permitted to sit with the subcommittee at today's hearing and ask questions.

Without objection, so ordered.

Thanks again for all of you being here today. Today's hearing will focus on the subcommittee's number one priority: ensuring the safety of the aviation system and the traveling public.

Our system is extremely safe; last year, nearly 850 million passengers boarded passenger aircraft within or flying to the United States and, due to the hard work of all of you and others in the aviation sector, there were no fatalities on those aircraft.

This milestone, however, does not mark the end of our work. While the high level of safety we have achieved is a result of close collaboration between Congress, the Federal Aviation Administration, industry, and labor, we must remain vigilant and recognize that we can always do more and be better to ensure the safety in our skies.

I would like to recognize the Colgan Air families who are in attendance today, and thank you for your steadfast support of safety issues, and we appreciate your being with us once again on this ninth anniversary of the tragic crash near Buffalo, New York.

Recent events and near misses remind us of the work that remains. Last year we avoided a potentially catastrophic event when an Air Canada jet carrying 140 people accidentally lined up to land on a taxiway where 4 planes were waiting to take off. These planes carried more than 900 people, and the margin between a near miss and one of the worst aviation disasters in history was less than 25 feet. That is a pretty scary thought. This near miss and others have rightfully focused our attention on runway safety.

But while we work to maintain and improve the safety of commercial airlines, we must also work to improve safety in other segments of aviation. The general aviation community makes up a

large and diverse part of our national airspace, including over 200,000 aircraft and approximately 500,000 pilots.

Again, due to the collaboration between Congress, FAA, and the aviation community, GA fatality rates have declined significantly over the past decade. However, in fiscal year 2016, there were still over 200 fatal GA accidents and over 350 total lives lost.

Helicopter safety also continues to be an area of focus for this committee. Too often we see helicopter crashes in which occupants survive, only to be injured or killed in post-crash fires. Just 2 weeks ago, a sightseeing helicopter at the Grand Canyon crashed, killing three, seriously injuring four. In this accident, there was a post-crash fire. Crash resistant fuel systems on rotorcraft continue to be a safety priority. And while the circumstances of the recent accident are still under investigation, there is a bipartisan consensus in Congress to address this issue.

Lastly, as drone operations in the national airspace continue to increase, the risk of them interfering with the safe operation of manned aircraft increases. The risk was illustrated on September 21st in 2017, when a small drone collided with a U.S. Army Black Hawk over New York Harbor, damaging the helicopter's rotor and forcing an emergency landing. While no one was injured, it is not hard to imagine that this kind of accident occurring again could have very, very serious consequences.

Aviation safety is not a destination, it is a never-ending process of evaluation, analysis, and course correction. Without continuous improvements in safety, the aviation industry as we know it would have great difficulty existing.

And as I said before, aviation safety has continued to improve as a result of Government, labor, and industry collaboration, but there is always a lot more to be done.

The FAA has primary responsibility for aviation safety, and it must ensure oversight activities that are open and transparent, as well as streamlined and efficient. Many safety improvements stem from the basic research, the introduction of new technologies, and the management of new users making their way into the airspace.

The FAA's Technical Center, located in my district—in case any of you did not realize that up to this point—Rick—plays a very critical role in the partnership between Government and industry. They continue to be a leader in conducting research and development, demonstration, and validation of the safe integration of new users and technologies into our airspace.

New technology and new users bring new risk. If not properly integrated, they could have an adverse effect on the civil aviation safety.

Each person on our panel has a unique role in ensuring the safety of the aviation system. We welcome these varied and unique perspectives as we continue to work together to ensure the United States continues to have the safest aviation system in the world.

Before recognizing Ranking Member Rick Larsen, I would like to ask unanimous consent that the record of today's hearing remain open until such time as our witnesses have provided answers to any questions that may be submitted to them in writing, and unanimous consent that the record remain open for 15 days for addi-

tional comments and information submitted by Members or witnesses to be included in the record of today's hearing.

Without objection, so ordered.

I now would like to recognize Mr. Larsen for any opening remarks.

Mr. LARSEN. Thank you, Chairman LoBiondo, for calling today's hearing on aviation safety. This is a very important hearing. Our aviation system is safe, safer than it has ever been before. No one has died in an accident involving a U.S. flight airliner since 2009, when Colgan Air flight 3407 crashed near Buffalo and claimed 50 lives.

Safe is not enough, though. This subcommittee's job is to provide the resources and oversight necessary for the Federal Aviation Administration to make the system even safer. That must be our starting point today. Everyone agrees we have the safest system in the history of flight. But what can we do to make the system safer still?

Well, for starters, that means not rolling back safety rules. Some have argued for a rollback of the strong pilot training rules that require 1,500 hours of flight time that Congress mandated after the Colgan Air crash. Those standards were the product of focused oversight by this subcommittee, and were enacted without any partisan objection.

If we want to talk about what Congress, the FAA, and others can do to make the airline pilot profession even more accessible to the next generation of pilots, we should have that conversation. But any reduction in the experience requirements for airline pilots is a nonstarter. Such a proposal has kept the Senate FAA reauthorization bill off the Senate floor for nearly a year.

Congress has never rolled back an airline safety rule, simply to respond to the market forces of supply and demand. If there is a pilot shortage—and that is a big if—we will find ways to address it without sacrificing safety.

I look forward to hearing from our witnesses about what the FAA can do to improve safety. I was pleased to join Ranking Member DeFazio and Congressman DeSaulnier last week in requesting a GAO [Government Accountability Office] study of safety in runway environments. Now is the time to take a closer look at what steps are necessary to prevent future near misses and runway incursions at airports across the U.S. A better understanding of current safety gaps would help ensure the safety of the 2.5 million people who fly in and out of U.S. airports every day.

Just last year, an Air Canada flight almost landed on top of a queue of airplanes waiting to take off at San Francisco. A landing Delta flight in Atlanta lined up with a taxiway in poor visibility before going around for another approach.

And a Horizon Air flight actually landed on the taxiway in Pullman, Washington, as did an Alaska Airlines flight in Seattle. Needless to say, we are fortunate that there were not any other planes on those taxiways.

The NTSB is investigating several of these incidents, and I understand the Department of Transportation inspector general is assessing runway safety, as well. I look forward to hearing more from

all of our witnesses about how we can prevent recurrences of these events before they lead to accidents.

I am also interested in hearing from our witnesses about what we should do to reduce the risk that a drone may one day collide with a conventional airplane. A provision in the 2012 FAA bill prohibits the FAA from directly regulating the recreational operations of drones. But, as recreational drone use flourishes, should the FAA be so restricted? What can the FAA do to prevent collisions between recreational drones and other aircraft?

Captain, Mr. Hampton, I know you have views on this subject and I look forward to hearing from you much more on that.

Chairman LoBiondo and I have a record of working together to improve safety and efficiency. And as the chairman enters the last year of his distinguished career in Congress, I look forward to continuing that work and moving the needle further. Again, Mr. Chairman, I thank you and I look forward to hearing from our witnesses.

Mr. LOBIONDO. Thank you, Rick.

Chairman Shuster?

Mr. SHUSTER. Thank you, Chairman LoBiondo. And I want to associate myself with the remarks made by both Ranking Member Larsen and LoBiondo. I share their observations, views, and concerns about safety in the air.

I also want to echo Chairman LoBiondo's thanks to the Colgan Air families for being here today, and your continued engagement in safety in our aviation system.

As pointed out many times, the United States has the safest aviation system in the world. That can never be taken for granted. It comes at a cost, it comes from hard work by the air traffic controllers, the flight attendants, the pilots, and the companies that all engage and work every day to make the system as absolutely safe as possible. So I want to thank them for that. But it will take all of us working together, Congress included, and the administration, to make sure that we have the gold standard. And safety is our highest priority.

And, with that, I yield back.

Mr. LOBIONDO. Mr. DeFazio?

Mr. DEFAZIO. Thank you, Mr. Chairman. In the 3 years since we last held an oversight hearing on safety in this committee, there have been 90 accidents involving commercial carriers. Thankfully, none of those were fatal. But still, there are a number of concerns.

In December, in my State, a SkyWest plane on approach to Medford went way below minimums and almost crashed into terrain before they did an evasive climb. Five days later, up in Washington State, a Horizon Air plane landed on the taxiway in Pullman. And in July an Air Canada A320 nearly landed on top of five jetliners with more than 1,000 people on board waiting to take off in San Francisco.

In view of this, Representatives Larsen, DeSaulnier, and I have requested the GAO review safety in the runway environment. These sort of incidents are not acceptable. And luckily, thus far, they haven't caused fatalities. But they could in the future.

I have also raised questions about the evacuation standards. We are now—as they jam more and more and more and more seats

into airplanes, we are not actually physically testing the evacuation standard any more. They use computer modeling. And I have asked for an investigation of whether that is adequate.

I mean we had one example—and this was a plane that doesn't have the more and more and more jammed-in seats, it was a 767 at O'Hare—when it took the passengers 2 minutes and 21 seconds to exit a burning aircraft, as opposed to 90. Imagine if that had been one of these low-budget airlines, where you can barely get your knees in between the seats, given the reduction in pitch.

You know, we are not going to dictate comfort, but we can certainly be concerned about safety. It took me 7 years to get a rule to get the overwing exit spacing after that horrible fire, where people were burned up trying to get out of a plane in Manchester, England. It took them 6 months. We can't be complacent about these kind of things.

For more than—just about a quarter of a century—since I had a certified mechanic working on my staff, I have been pursuing the whole issue of unapproved parts with the FAA. We are going to have the IG report soon, and we have not yet tightened up the way we need to tighten up, in terms of certifying SUPs [suspected unapproved parts].

I had the bizarre and absurd argument when I was pushing this issue before that if you take a life-limited part that could be burnished up to look kind of like new, but was only good for scrap, that you couldn't require that it be shredded or otherwise indelibly damaged, because it is a property right.

And I said, "Well, if the only value is scrap, and they are not going to try and sneak it back into the chain by burnishing it up, what is the property right that we are protecting here?"

And apparently some airlines are catastrophically destroying the parts. My staff witnessed United Airlines doing that in San Francisco. But others aren't. And you have got to wonder what happens to those parts, which could very easily take down a plane. And we have got to get that resolved.

After the ValuJet crash, my amendment, which I had offered a number of times over the years, to strip the FAA of its promotional duties and say they should focus on safety issues, was rejected in the FAA bill that year and was not in the Senate bill. But after the ValuJet crash they called me up and said, "Where would we put this in the bill?"

I said, "Well, it is not conferenceable. Wasn't it out of the bill? You rejected it." Well, most of it ended up in the bill in the end, but we still have progress to make there, in terms of FAA oversight.

As was noted by Ranking Member Larsen, we have the strongest pilot training rules in history. Unfortunately, it took a horrific accident to get to that point, and now there is tremendous pushback on that. But when you look at the first officer in that case living in her parents' basement, commuting across the country because she was earning $15,800 a year, but, you know, had probably spent a couple of hundred thousand dollars to get her license, they say, "Oh, that is—we have got a horrible shortage here." Well, market forces are starting to work. Some of these airlines are having to raise their salaries.

Yes, you are going to have a shortage if you try and pay them less than a Greyhound busdriver when they paid a quarter million bucks to get the certificate to fly the plane. I have yet to meet a person in the air that says, "Geez, if I could have got $10 off, I would be happy to have someone who has 250 hours in the front seat." Huh-uh, I don't think so. There is some pushback here that has got to be dealt with.

And then drones. Congress, rather stupidly, adopted an amendment in the FAA bill restricting the FAA regulation of drones flown by recreational users because the model airplane people objected. Well, now there are hundreds of thousands of these things out there with people who have been interfering with firefighting, they have flown one into a helicopter. We have had many near misses with jetliners.

Finally, FAA, 2½ years ago, I said, "Could you figure out what happens when a drone hits a plane?" And their first studies are it can cause catastrophic damage because these are brittle and hard. And they haven't even done the engine test yet, sucking one in and see whether we have an uncontained explosion of the engine.

So, we have got to change that, and we have got to get a handle on these recreational drones before they take down a commercial airliner and kill people. A lot of work to do.

Thank you for holding the hearing, Mr. Chairman.

Mr. LOBIONDO. Thank you, Peter, and I want to thank our witnesses today.

We have Mr. Ali Bahrami, Associate Administrator for Aviation Safety for the FAA; Mr. Akbar Sultan, Deputy Director of the Airspace Operations and Safety Program at NASA; Mr. John DeLisi, Director of the Office of Aviation Safety of NTSB; Mr. Matthew Hampton, assistant inspector general for aviation audits in the Office of Inspector General of the U.S. Department of Transportation; and Captain Tim Canoll, president of the Air Line Pilots Association.

I would like to remind and ask each of our witnesses to do your best to limit your opening remarks to no more than 5 minutes.

Mr. Bahrami, you are recognized for your opening statement. Welcome.

TESTIMONY OF ALI BAHRAMI, ASSOCIATE ADMINISTRATOR FOR AVIATION SAFETY, FEDERAL AVIATION ADMINISTRATION; AKBAR SULTAN, DEPUTY DIRECTOR, AIRSPACE OPERATIONS AND SAFETY PROGRAM, NATIONAL AERONAUTICS AND SPACE ADMINISTRATION; JOHN DELISI, DIRECTOR, OFFICE OF AVIATION SAFETY, NATIONAL TRANSPORTATION SAFETY BOARD; MATTHEW E. HAMPTON, ASSISTANT INSPECTOR GENERAL FOR AVIATION AUDITS, OFFICE OF INSPECTOR GENERAL, U.S. DEPARTMENT OF TRANSPORTATION; AND CAPTAIN TIM CANOLL, PRESIDENT, AIR LINE PILOTS ASSOCIATION, INTERNATIONAL

Mr. BAHRAMI. Thank you, Mr. Chairman. Chairman LoBiondo, Ranking Member Larsen, members of the subcommittee, thank you for inviting me to appear today to discuss the current state of aviation safety.

We are proud to say we are in the safest period in history. We have achieved this record of safety by working with industry to identify and address risks to our system. With the support of this committee we have worked to take a more proactive approach that instills a culture of safety, both within the industry and inside the FAA.

The result is the safest, largest, most complex, and most efficient air transportation system in the world.

There has not been a fatal U.S. commercial passenger accident since 2009. Last year we had the safest year ever for general aviation. All of us at the FAA are proud of the hard work that has gone into providing a basis for achieving this level of safety.

A number of initiatives led to this safety record, and I will discuss a few of them this morning. We are actively facilitating policies and management processes that transform safety culture, both within the FAA and outside organizations.

For example, we are restructuring the Flight Standards Service. This organization plays a vital role in the safety of the U.S. aviation system. We want to make sure we continue to provide a high level of service. By moving away from our organizational structure based on geographical locations to one built around functions, these changes enable flight standards to operate with greater accountability, better use of resources, and flexibility to adapt to change.

The FAA expects the restructuring to yield benefits to both the agency and aviation community by improving our ability to keep pace with changes in the aviation industry. In the area of aircraft certification, the FAA has gone beyond the reforms that Congress directed in the FAA Modernization and Reform Act of 2012. We are transforming our aircraft certification service to meet the demands of today's dynamic aviation environment. Refreshing the certification strategy means FAA will take a systems approach, allowing us to focus on areas of higher risk.

The impressive gains in safety are due, in part, to voluntary actions by industry and Government. The work of CAST, the Commercial Aviation Safety Team, has been extremely successful. It has moved beyond the historic approach of examining accident data to a more proactive approach that focuses on detecting and mitigating risks. Today, using a disciplined, data-driven approach, we strive to identify hazards before accidents or serious incidents occur. Together, Government and industry have adopted nearly 100 voluntary safety enhancements.

We also are expanding this type of cooperation in the general aviation community. Together we have been working toward a goal of 10 percent reduction in the fatal GA accidents by the close of fiscal year 2018. I am pleased to say we already surpassed that goal.

Before I conclude my remarks, I would be remiss if I did not acknowledge the support of Chairman Shuster and subcommittee chairman Mr. LoBiondo.

You have been instrumental in providing the FAA with the direction and necessary resources to maintain our position as the global leader in aviation. Your guidance and insight have made a difference in aviation, both here and abroad.

This concludes my statement. I will be happy to answer any of your questions at this time.

Mr. LOBIONDO. Thank you, Mr. Bahrami, for your statement.

Mr. Sultan, you are recognized for your statement.

Mr. SULTAN. Thank you, Mr. Chairman. Chairman LoBiondo and Ranking Member Larsen, Chairman Shuster of the committee, Ranking Member——

Mr. LOBIONDO. Excuse me, can you pull your mic a little bit closer?

Mr. SULTAN. I apologize. Chairman LoBiondo and Ranking Member Larsen, Chairman Shuster and Ranking Member DeFazio of the committee, and members of the subcommittee, thank you for this opportunity to appear before you today to testify on NASA's aviation safety research.

NASA has made decades of contributions to aviation. Every U.S. aircraft and U.S. air traffic control facility has NASA-developed technology on board. NASA has worked with FAA and industry on the long-term research to produce information and technologies to fundamentally solve aviation risks.

For example, in the 1980s, NASA initiated research efforts associated with synthetic and enhanced vision systems to allow aircraft to land in low-visibility conditions. Today a large number of aircraft offer these capabilities and multiple manufacturers have developed systems for tablets that can be used on board general aviation aircraft.

Another good example from the late 1970s was NASA research that led to the identification of cultural norms within the aviation community that resulted in increased vulnerability to crew communication errors. NASA developed training methods and technologies, techniques to support improved Crew Resource Management, or CRM. Since then, CRM has become a global standard with training requirements mandated by the FAA, ICAO, and EASA, the European Aviation Safety Agency.

Now, as we look forward, aviation is on the verge of a significant transformation with a rapid evolution of new technologies, vehicles, and operations on the horizon, while retaining the high standards for safety to which we are accustomed. Maintaining a safe system will require recognition and timely mitigation of safety issues as they emerge before they become hazards or lead to accidents. A shift toward proactive risk mitigation will become critical to meet these needs.

In collaboration with the aviation community, NASA has developed a vision for safety assurance that is achieved by leveraging growing sources of aviation data, commercial data, analytics methods, architecture, and innovative things to enable monitoring, prediction, and prognostics capabilities.

In addition, NASA is addressing difficulties associated with assuring the safety of increasingly complex and autonomous aviation systems. NASA is developing improved methods, tools, and guidance to support cost-effective verification and validation and certification of software-intensive and complex systems.

NASA contributes to the Commercial Aviation Safety Team, or CAST, Aviation Safety Reporting System, otherwise known as ASRS, and Aviation Safety Information Analysis and Sharing, also known as ASIAS.

NASA has delivered technologies to prevent loss of airplane state awareness, and is currently completing the research and development of cockpit systems with predictive algorithms to alert pilots, models for aircraft stall performance to improve fidelity of training environments, and specific flight crew training methods.

Special attention is being directed toward assuring safety of emerging operations, such as unmanned aircraft. Ongoing research is dedicated to understanding hazards unique to these vehicles and identifying data needs associated with monitoring such operations for potential risks.

Specifically, NASA's UAS [unmanned aircraft systems] in the NAS [National Airspace System] project may enable routine access to larger UAS and to regular controlled airspace by delivering data to RTCA rulemaking committees.

In addition, NASA's UTM [UAS Traffic Management] research project may enable beyond-visual-line-of-sight access by small UAS to the uncontrolled low-altitude airspace below 400 feet through technology demonstrations to validate operational concepts.

NASA is building on a long history of conducting research that advances state-of-the-art technologies to reduce the risk of flying in hazardous conditions. The phenomena that creates engine icing issues is not well understood. NASA has conducted flight tests to better characterize the environment, and has emulated these conditions in a ground facility that has already proven to be very beneficial to industry.

NASA and FAA have established Research Transition Teams, or RTTs. The RTTs have been a best-practice mechanism between NASA and FAA in ensuring effective coordination in transition of research to implementation. Through the RTTs, NASA works jointly with FAA's William J. Hughes Technical Center on joint simulation and testing of assurance tools to help FAA assess aviation systems.

NASA has a long and successful history of aviation safety research that has made a real difference in the remarkable safety record that our system enjoys. And we are constantly looking for ways to continue to contribute, with a major emphasis on more prognostic approaches that will allow the aviation community to get out in front of issues before they become safety risks.

Let me conclude by thanking you again for this opportunity to appear before you to discuss NASA's research and to answer any of your questions.

Mr. LOBIONDO. Thank you.

Mr. DeLisi?

Mr. DELISI. Good morning, Chairman LoBiondo, Ranking Member Larsen, and members of the subcommittee. Thank you for inviting the National Transportation Safety Board to testify before you today.

The NTSB is an independent Federal agency charged by Congress with investigating every civil aviation accident in the United States, and issuing safety recommendations aimed at preventing future accidents. We investigate about 1,300 accidents per year.

The U.S. aviation system is experiencing a record level of safety. Since the crash of Colgan Air flight 3407 in 2009, there have been

no passenger fatalities on board U.S. part 121 air carriers providing scheduled service.

However, there were 412 aviation deaths in 2016; 386 of those fatalities occurred in general aviation accidents, and 26 occurred in part 135 commercial operations. Although we would all like to see no fatalities, the good news is that the general aviation accident rate fell below one fatal accident per 100,000 flight hours for the first time in the NTSB's 50-year history.

The number one cause of general aviation accidents continues to be loss of control in flight, leading the Board to place this issue on our current most wanted list of transportation safety improvements. We are working with stakeholders to increase awareness, education, and training to address the risk of these events. In April we will hold a roundtable with industry and Government experts to discuss technologies and training to combat loss of control.

I want to highlight several accidents we have investigated in the last 2 years that have raised safety issues.

In 2016 the deadliest U.S. aviation accident in almost a decade occurred in Lockhart, Texas, when a commercial hot air balloon pilot and his 15 passengers died when the balloon struck power lines. The investigation found that the pilot had been previously diagnosed with medical conditions known to cause cognitive deficits, and had taken a number of impairing medications. However, commercial balloon pilots are exempt from the requirement to hold a medical certificate. The NTSB recommended that the FAA remove that exemption.

In July 2015 a helicopter crashed after takeoff in Frisco, Colorado. The pilot was fatally injured, and the other two occupants were seriously injured. We found that the impact forces of the accident were survivable. However, the post-crash fire contributed to the severity of the injuries. The NTSB made recommendations that continue to push for the installation of crash-resistant fuel systems in helicopters.

In November 2015, a part 135 air taxi crashed on approach to Akron, Ohio, and all nine people on board died. We found that the flight crew failed to follow a number of company standard operating procedures, and operated the airplane in an unsafe manner. However, the airplane was not equipped with any type of recording device that would have allowed for the company to monitor daily operations and identify deficiencies such as noncompliance with procedures. As a result, the NTSB recommended that all part 135 operators install flight data recording devices capable of supporting a flight data monitoring program.

In October 2016, an American Airlines flight experienced an engine failure and caught fire during takeoff at Chicago O'Hare International Airport. Although everyone evacuated the airplane with only one serious injury, our investigation found that the evacuation was hindered by a lack of communication between the flight deck and the cabin crew, as well as by numerous passengers retrieving their carry-on baggage.

In July an Air Canada flight was cleared to land on runway 28 right in San Francisco International Airport, but instead lined up on a taxiway where four air carrier airplanes were awaiting their takeoff clearance. The flight descended below 100 feet before exe-

cuting a go-around as it overflew the other aircraft on the taxiway. We are continuing to investigate this incident.

Advances in aviation technology, such as unmanned aircraft systems, are posing new safety challenges. The NTSB just completed the first investigation of an incident resulting from a mid-air collision between an aircraft and a drone, which occurred near Staten Island, New York, in September. The drone pilot intentionally flew his drone far beyond visual line of sight and was unaware that it had impacted the helicopter.

Thank you again for the opportunity to be here today to discuss the work that the NTSB is doing to investigate accidents and make aviation safer. I will be happy to answer any questions.

Mr. LOBIONDO. Thank you, Mr. DeLisi.

Mr. Hampton, welcome.

Mr. HAMPTON. Thank you. Chairmen Shuster, LoBiondo, Ranking Members DeFazio, Larsen, and members of the subcommittee, thank you for inviting me to testify today on aviation safety.

As the committee is well aware, FAA and the industry have achieved a remarkable and impressive safety record. My statement today will address the key aviation safety challenges that were highlighted in our recent report on the top management challenges facing the Department.

First, regional airlines now serve about 20 percent of all airline passengers, rely on a unique business model, and operate in a highly competitive environment. Our work shows that FAA can provide better guidance and tools to its inspectors so they can proactively identify risks due to changes at airlines and adjust oversight accordingly.

For example, FAA's main risk-assessment tool does not yet account for severity of risks such as key staff turnover or rapid service expansion.

Second, addressing concerns about suspected unapproved parts, or SUPs. As we recently reported, FAA lacks the mechanisms needed to have a full and complete picture of risks with unapproved parts throughout the industry. For example, we found multiple inaccuracies in the database FAA uses to capture such cases, and the agency does not ensure all reports of suspected unapproved parts from its local inspection offices make it to the central hotline office at headquarters.

Furthermore, once unapproved parts are identified, FAA does not take action to confirm that airlines and repair stations actually take them out of the supply chain. We recently learned that FAA closed one case, but we are looking into how the parts actually made it back into the supply chain.

Third, we are concerned about the number of close calls in the air and the ground at the Nation's airports. This includes the Air Canada flight 759 incident at San Francisco Airport last summer, which the safety board is currently investigating. Our work focuses on runway incursions, which have seen an overall increase.

FAA has taken several efforts over the last decade to address runway safety issues. Our results thus far show that FAA has made progress on educating pilots on visual aids at high-risk airports and communicating more with the aviation community. However, FAA faces challenges with other initiatives, including some

new technologies that were very promising. The key to addressing the upward trend in recent incidents is for the industry to continue setting priorities and measuring the effectiveness of initiatives. History has shown that FAA can, with sustained attention, successfully address runway safety issues. But a sense of urgency is needed at FAA.

Finally, UAS presents one of the most vexing and rapidly evolving safety challenges FAA has faced in decades. As UAS operations have increased, so too have sightings and concerns by pilots and others, with over 2,100 events reported in 2017. We are currently assessing FAA's efforts to grant waivers, a process the agency established to accommodate some high-value operations not covered in the small UAS rule published in 2006. FAA has received more than 15,000 applications for waivers to date. Thus far, the agency has granted about 1,500 of them, most of them for nighttime operations.

There are over 6,500 applications still pending review, and the backlog continues to grow. FAA is working on rulemaking for expanded UAS operations, but these are complicated endeavors, and it is unclear when they will be completed.

Our work shows that FAA can take steps now to advance elements of a risk-based system for UAS. This includes, among other things, completing a comprehensive system to track and analyze UAS sightings, and giving inspectors more guidance and information. Also, FAA is reaching an inflection point, where education must give way and be bolstered with more effective oversight and enforcement.

Mr. Chairman, that concludes my statement. I would be happy to answer any questions you or any members of the subcommittee may have.

Mr. LOBIONDO. Thank you, Mr. Hampton.

Captain Canoll, you are welcome.

Mr. CANOLL. Thank you and good morning, Chairman LoBiondo and Ranking Member Larsen and the subcommittee for the opportunity to be here today.

Chairman LoBiondo and Chairman Shuster, this may be my last time testifying before both of you. On behalf of ALPA's more than 60,000 members, please let me express our sincere appreciation for your leadership in advancing aviation safety.

I have been an airline pilot for 28 years. I keep current and I fly the MD–88 as often as I can. I am also proud to have served in the United States Navy Reserve as an F–18 strike fighter squadron commanding officer. And I can tell you, after flying for more than three decades, that experience counts when operating complex equipment in a changing environment. So does constantly maintaining and sharpening your skills and judgment through training.

Flying experience enables pilots to learn how to gather information through their senses about their environment and their aircraft. It cannot be simulated in training. It is learned only from time spent at the controls. The examples of the value of real-world experience are almost infinite. An airline pilot might encounter multiple aircraft talking on the radio at the same time, unexpected turbulence, or an engine malfunction, or all three at once. Today's

simulators simply can't replicate the complexity of commercial flight. Real-world experience is essential.

ALPA pilots know this, know that this subcommittee recognizes the value of flight experience, qualifications, and training for airline pilots. You led Congress in passing the Airline Safety and FAA Extension Act of 2010, the set of regulations that resulted in improved pilot training and updated certificate and type rating requirements. The results speak for themselves.

In the 20 years prior to the congressional action, more than 1,100 passengers lost their lives in U.S. part 121 airline accidents. Since Congress acted, that number has been reduced to zero.

ALPA is aware that some believe we can reduce training hours, substitute simulator or unstructured class time for experience, and still keep our skies safe. To put it plainly, we disagree. The current system allows for credit hours for different levels of training and experience. This system is working. It is keeping our passengers, crews, and cargo safe.

Let me be clear. No one is more committed than ALPA to ensuring that we have enough pilots to keep the U.S. airline industry strong and competitive. Today we have more fully qualified pilots than there are commercial positions available in this country. But how do we make sure we have the pilots we will need in the future?

One important element is protecting our industry safety record. Our union is helping lead the way. For example, we are pushing to do more to safeguard the transportation of lithium batteries by air. For similar reasons we are also working to eliminate the risk of undeclared dangerous goods.

In addition, ALPA is driving hard to reduce the safety threat from unmanned aircraft systems. We commend recent action by Congress to enable the FAA to require UAS operators to be registered. This allows us to locate responsible individuals, if needed. But we also must fix the loophole that prevents the FAA from regulating UAS used by hobbyists. Congress must repeal section 336 of the FAA Reauthorization Act of 2012.

Attracting new pilots to our industry in the future also means that U.S. airlines must offer aviators good salaries, a healthy work-life balance, and a predictable career progression. And there is more we can do.

For example, we can reform the Federal student loan programs to encourage young people to pursue our profession. Our industry can also step up efforts to reach new audiences and inspire them to work in aviation. At ALPA, we are building on decades of outreach to students of all ages. Hundreds of ALPA volunteers visit schools every year, and we have helped launch Aviation Works 4U, a one-stop shop website for exploring a career in our industry.

We are also focused on doing more to provide reliable air service to communities all across America, including in rural areas. With safety always the priority, there is more work to be done there, too.

I hope you share my optimism today as we consider the U.S. airline industry's incredible safety record. Take it from us, your pilots, experience saves lives. We look forward to working with this subcommittee to make aviation even safer. And I would be glad to take any questions that the subcommittee has.

Thank you, sir.

Mr. LOBIONDO. Thank you, Captain.

Chairman Shuster?

Mr. SHUSTER. Thank you very much, Mr. LoBiondo. My question is directed at the NTSB, the FAA, and NASA, and it is concerning space and travel—space travel.

I watched a couple weeks ago the Falcon Heavy take off, and Elon Musk said it was a 50/50 chance it was not going to succeed, and it did. It was quite impressive. But as we saw last year, there were 18 launches into space. This year they are projecting 20. And I have seen estimates that in the next several years it could be 100, over 100 launches every year, and that is critical, with the FAA, NASA—coming to work together to make sure that the airspace is safe.

And so, just wanted to first ask, starting probably with NASA, how has your relationship been with the FAA? And then, from there, move to FAA, but also then to—and the NTSB and talk about how do we—how do you investigate and how has it worked with these two other agencies when you go there?

So, Mr. Sultan, if you would be——

Mr. SULTAN. Thank you for the question. In regards to a relationship between NASA and FAA, I would describe it as it has been the closest it has ever been. We work very well, and this is the best in the history that we have ever worked together.

Currently between the two agencies, we have established these—we call them the RTTs, the Research Transition Teams.

Mr. SHUSTER. Can you move your mic a little closer to you?

Mr. SULTAN. Yes.

Mr. SHUSTER. That whole box will shift. There you go.

Mr. SULTAN. Thank you. Between the two agencies we have established these RTTs. We call them the Research Transition Teams. And right now we have six of them active on very specific, unique, and tangible products that the two agencies cooperate, and what we are doing is making sure that the work that we do as a research is, first, well coordinated with the implementing agency so that it is put on their implementation timeline well before we do the handoff, and then FAA knows actually what to do with it, and also do the implementation.

Furthermore, at the executive level, we hold, you know, extensive quarterly meetings. This is at Associate Administrator levels between the FAA's AVS [Aviation Safety] group, Air Traffic Organization, the NextGen Office, as well as international environment and energy, where the Associate Administrators do coordinated work to make sure that our efforts are fully aligned with each other's needs.

Mr. SHUSTER. So the bottom line is it has—from your point of view, it has been working extremely well.

Mr. SULTAN. Absolutely.

Mr. SHUSTER. All right. And Mr. Bahrami?

Mr. BAHRAMI. Mr. Chairman, let me highlight what you already mentioned, which is the increased number of launches. And one of the issues that we are taking very seriously is collaboration with other Government agencies that have tremendous experience, including NASA.

And on the other part of the work that we are doing is a thorough risk assessment prior to each launch, and using the expertise that we have in-house, and using the safety management principles to make sure, in the event we have an issue that we are protecting other aircraft and vehicles in the airspace.

So, as was mentioned by Mr. Sultan, we have a good working relationship, we continue to work together and improve things as we move forward.

Mr. SHUSTER. Thank you. And Mr. DeLisi, if you could, also just comment on what you have seen in the interaction and then investigations and how you would operate in that environment.

Mr. DELISI. Sure, thank you. Commercial space is certainly a game changer. It is something that didn't exist when our agency was founded, but we stand at the ready now to investigate the commercial use of space.

A few years ago we completed the investigation of the Virgin Galactic scaled composite SpaceShipTwo fatal accident. It was our first fatality involving a commercial space vehicle. But we have a relationship with the FAA's Office of Commercial Space Transportation, and our party process allowed us to form an investigation using our normal procedures, making some recommendations to both the FAA and the Commercial Spaceflight Federation regarding the design of the cockpit switchology in commercial space vehicles.

One big difference, however, would be the definition of an accident. For a commercial space vehicle that carries a command destruct system, we would not consider it to be an accident if a launch were going off target and a command destruct were initiated. As long as the debris fell in the cleared area, that would be—the substantial damage to the vehicle would not trigger an NTSB investigation. We would only get involved if there were fatalities or debris that ended up outside the expected pattern.

Mr. SHUSTER. Well, thank you. My time has expired, but I think we got to watch this very closely, because we are going to see more and more of this, and making sure, from a policy standpoint, that the right agencies are in the right place making these decisions, and not trying to set up new and different agencies that don't have the experience that you three do. So thank you very much.

Mr. LOBIONDO. Peter?

Mr. DEFAZIO. Well, and talking about agencies that don't have experience, we have the Pipeline and Hazardous Materials Safety Administration, so-called, as the principal regulator of lithium batteries on commercial aircraft. Now, isn't that interesting? And that is, you know, at the behest of this administration.

And then, of course, Congress has prohibited the regulation of lithium batteries beyond any weak rules that ICAO might adopt, which doesn't seem really wise to me—Captain Canoll, you obviously raised this concern, and you certainly know that UPS flight 1307 in 2006, UPS flight 6 in 2010, and Asiana Airlines cargo flight 991 in 2011 all were destroyed because of lithium batteries.

Now, is there anybody on this panel who thinks that Congress should prohibit the FAA from investigating the dangers of lithium batteries, and proposing more stringent regulations than those adopted by the international consensus authority, ICAO? Anybody

want to raise your hand, say that that is a prudent thing we are doing here?

OK, thanks.

How about the other prohibition that Congress has adopted because of the clout of the model aircraft lobby? Now, I know model aircraft operators, people—I used to build little planes when I was a kid. My brother did, too. You know, they are generally responsible, knowledgeable people.

But there's a few hundred thousand of them, and there are now millions of people with these little, crappy recreational drones flying around, and we have already talked about those problems. Anybody on the panel want to raise their hand and say that we, Congress, should continue to restrict the FAA from regulating beyond "we are going to educate you" about where you should fly your drone?

Anybody want to raise their hand on that one?

OK, well, maybe——

Mr. BAHRAMI. Mr. DeFazio, may I make a comment on that?

Mr. DEFAZIO. Yes.

Mr. BAHRAMI. Absolutely. We agree that something needs to happen to give us better control of the situation.

And we also want to acknowledge that the work that modelers are doing from the perspective of STEM and promoting aviation within the younger generation is really important. And as we move forward, it is very important that we work with you and your staff to find out what is the best way to go forward.

I absolutely agree with you; we need to do something. And I do not know what that is at this point. But we are certainly willing to work with you to make that happen.

Mr. DEFAZIO. Right. Well, we had that core challenge, and now we can't even require registration and/or licensure for these things. I mean in my hometown someone was using a UAS as a peeping Tom device and someone managed to bring it down. But, of course, we have no idea who it belonged to, because we can't trace them back. It seems to me that is pretty minimal, that we would require, you know, that they be registered and/or potentially licensed.

I want to go back to the suspected unapproved parts. Mr. Hampton, I mean I have been working on this for so many years. And you mentioned at the end something that—it was something about the—I don't think it was in your testimony, exactly, about some—a SUP that got back into the supply chain that is being investigated.

Mr. HAMPTON. Yes. Thank you for the question, Mr. DeFazio. During the course of our review there was a case. A gentleman put a number of parts, 65,000 Boeing parts, on the internet. And FAA investigated it and found out that he was not going to sell 65,000 parts. And we thought it was taken care of, and the issue was put to bed.

We subsequently opened another case, and we are looking into it. It appears they have now been reintroduced into the supply chain, and we are going to find out what happened to those parts.

So, it is a perfect example. It is not just the instance of what happens to a suspected unapproved part, but it has to be taken out of the supply chain. The problem is, as you well know, in many of

the cases, a suspected unapproved part doesn't affect civil aircraft, it can affect a military aircraft. Some aircraft, like in the Boeing series, can go back and forth to military and civilian fleets.

So the trick there is—and it is very important—to make sure they don't make their way back into the supply chain. Because you know the term "pedigree of the part," once it is back in, it is very hard to trace.

So we will keep the committee apprised. We are trying to figure out what happened. We don't know exactly whether these things will be used in an aviation mode; we just don't know. But we are concerned about that. And that illustrates the importance. And we have an open recommendation: FAA is finalizing how they will get their inspectors to make sure that the parts are actually taken out of the supply chain.

Mr. DEFAZIO. How about we all follow the United Airlines model and they are shredded? I mean I have never understood this property right argument that, gee, well, I don't know, maybe somebody wants to take this part that could be burnished up to look like brandnew, and turn it into a lampholder. And so, therefore, it is more valuable than scrap metal. So gee, you know? But I mean what is the deal? Seriously.

Mr. HAMPTON. We understand that FAA can't destroy it, but they have to have the person who is in possession of it take care of it and destroy the part. But your point is well taken. And that is the importance of getting rid of the part actually out of the supply chain.

Mr. DEFAZIO. OK. Thank you. Thank you, Mr. Chairman.

Mr. LOBIONDO. Thank you. Captain Canoll, ALPA has endorsed the 21st Century AIRR [Aviation Innovation, Reform, and Reauthorization] Act, and has said that the bill improves the safety of our transportation in the United States. Can you tell us how you believe that will happen, and why it does improve safety?

Mr. CANOLL. So the act, in general, has many provisions that would enhance safety, one being the enhancement to our voluntary reporting systems, which—a lot of our improvements recently have been based upon the concept that voluntarily disclosing a problem in the system and, in return receiving a level of immunity, has given us a volume of information far beyond what we had before to anticipate problems before they actually occur in the system.

We can see a particular airport, for example, has higher examples or higher incidents of unstable approaches. Then we can modify our training syllabus to address that particular approach so that the fleet of aircraft and pilots out there operating to that airport know that that is a known hazard and have been trained to deal with it. That is one example. The——

Mr. LOBIONDO. Can you—excuse me. Can you address how ALPA believes that the air traffic control reform and modernization contributes to the improvement of air safety?

Mr. CANOLL. So, in all proposals with regard to reform of the ATC system, we approach it incrementally. And the first step is an analysis of: is the proposal deemed to provide an equivalent level of safety that we have today, which, of course, as we all know, is extremely high. Our analysis of this proposal that is currently in

the House does just that, it does provide an equivalent level of safety that we are experiencing today, a very high one.

Mr. LOBIONDO. Thank you.

Mr. Sultan, can you describe how NASA uses Research Transition Teams to hand off NASA aeronautical research at the FAA Technical Center?

Mr. SULTAN. So the hand-off occurs to multiple organizations within the FAA. What we do is we work jointly with the FAA Tech Center in New Jersey on the simulations and the evaluation of and validation of the concepts in an integrated fashion with the real-world systems. So the tech center offers us that unique capability.

Likewise, on the systemwide safety assurance RTT, we work jointly with the FAA Tech Center researchers on the V&V of complex and software-intensive systems in developing algorithms and testing those algorithms in order to help certify and speed up the certification process of software-intensive systems.

Mr. LOBIONDO. OK, thank you very much.

Mr. Larsen?

Mr. LARSEN. Thank you, Mr. Chairman.

Captain Canoll, would you support the FAA reauthorization bill that we have been discussing if the ATC privatization was not in it? Would ALPA support it without the ATC privatization?

Mr. CANOLL. I hadn't contemplated it, but, you know——

Mr. LARSEN. Well, contemplate it. Would you support it without——

Mr. CANOLL. Yes, sir.

Mr. LARSEN. Thank you.

Mr. CANOLL. We would, because it has many other factors that advance safety.

Mr. LARSEN. Thank you.

Mr. Bahrami, the FAA bill—I am sorry, the FAA budget proposes $197 million in cuts, including $27 million to the FAA's operation account, $69 million to the F&E, and $101 million to the FAA's research, engineering, development accounts. That is the proposal for 2019.

What specifically would you do to ensure that these cuts, if enacted, would not adversely affect safety?

Mr. BAHRAMI. As you know, this is not the first time we are faced with these types of cuts. We typically reprioritize. We look at the sense of urgency, we look at the type of research that can only be done by Government agencies, including the FAA, and we also try to rely on those types of researches happening in industry, and try to promote and advance those types of activities.

And bottom line, we are going to have to reevaluate our work. We have to figure out where the priorities are, and fund those activities that are critical to our safety mission.

Mr. LARSEN. And you would choose a safety mission first, then?

Mr. BAHRAMI. Safety mission and enabling activities. And in terms of enabling activities, fortunately, in a lot of areas industry takes the lead, and we will make sure that we can work with them closely in those areas.

Mr. LARSEN. Mr. Hampton, based on that, what would you say—it is kind of tough to pick and choose, there is plenty of issues that

we are dealing with on aviation safety, but what would be the biggest threat, in the IG's view, to aviation safety?

Mr. HAMPTON. Thank you for the question, Mr. Larsen. We wonder back at the IG—we talked to Mr. Scovel on what keeps the inspector general up at night—and I think right now the safety of unmanned aerial systems is the big concern. It is not when but if there is a collision with a commercial aircraft. And we just hope there are no passenger injuries or fatalities.

That is our top safety concern, followed closely by the close calls at airport runways and taxiways right now.

Mr. LARSEN. Yes. And in your recommendations with regards to UAS, could you reiterate those recommendations?

Mr. HAMPTON. Sure. Most of our recommendations focus on helping FAA become more risk-based and getting their information systems lined up: a single depository for tracking all their sightings; another one for getting their systems in place. Another one is having better guidance to their inspector workforce—information to better position the agency to respond to the impact of technology on FAA and the industry.

The UAS is probably one of the most difficult and cross-cutting things that is going to affect the agency. So those are two of the recommendations we think that they can move out forthwith and make some progress on.

Mr. LARSEN. Yes. Thanks.

Mr. Bahrami, do you think the FAA has that authority to move forward on those particular steps, or do you think that you need a direction from Congress?

Mr. BAHRAMI. We are working on a number of initiatives. When we talk about UAS and the risk of UAS in aerospace, basically the issue is being able to validate and verify the sightings. This is a huge problem. We know that we started an ARC [Aviation Rulemaking Committee] that looked at the ID, remote ID. So until such time we are able to go forward with that, we are going to continue to have challenges identifying and enforcing the rules.

Mr. LARSEN. That is fair.

And Mr. Sultan, the role that NASA plays in developing a traffic management system with UAS, can you tell us where NASA is on timelines to get us to a point where we can start, you know, if you will, seeing that in the sky?

Mr. SULTAN. Thank you for the question. So we have two different projects. One is focused on the larger class, higher altitude controlled airspace access——

Mr. LARSEN. Right.

Mr. SULTAN [continuing]. And one is on the low altitude, below 400 feet, small UAS. In regards to the UTM, which is the lower altitude one, we have a set of high-fidelity field trials conducted almost on an annual basis, which will look at integration of these vehicles in higher density operations.

So we started off with just operating in rural areas. The next level was with some additional, you know, people and objects nearby. And the third one is operating beyond visual line of sight with additional vehicle integrations, manned operations. And of course, the fourth one, which will be conducted in 2020, is mainly focused on dense, urban operations, or a simulated environment of that.

The key is that this industry is still very much in infancy, in terms of the data needed in order to certify these vehicles and generate the regulation. So what NASA is doing in both of their high altitude, as well as the low-altitude UAS projects, is generating that data and delivering it to the FAA, as well as the standards organizations, such as RTCA, so that they can make informed decisions on what the regulations and certifications ought to be.

In a nutshell, we don't know what we don't know. That is what it boils down to in regards to, you know, the UAS operations. And that is the gap that NASA is trying to fill.

Mr. LARSEN. Yes, thank you. I yield back.

Mr. DAVIS [presiding]. Thank you, Mr. Larsen. The Chair recognizes the gentleman from California for 5 minutes.

Mr. LAMALFA. Thank you, Mr. Chairman. Thank you to the witnesses for appearing with us here today and for your expertise. Just a couple of things.

Mr. Hampton, I wanted to direct to you here, I come from an extremely rural district in northern California, and wanted to see if you can update on the issue of contract towers versus the regular ATC towers. A 2012 study at your office had shown they were just as safe and effective as a regular ATC tower—that being the contract towers.

So, you know, it is a good cost-saving measure, it helps our rural airports, rural areas, to hang on much longer than if they had higher costs.

And so, again, having so many rural airports in my district or a lot of districts like it in the West, I just wondered. Does that remain a priority or a good tool? Do you have any findings on contract towers?

Mr. HAMPTON. Thank you for the question. Historically, we have looked at the contract tower program, and it has been a very cost-effective and safe program. We recently received a request from this committee to update our work, and we intend to start that assignment in the not-too-distant future and complete it. Probably some time next year.

Mr. LAMALFA. Are those that are questioning them or wanting to do away with them, is there any movement that way you are aware of?

Mr. HAMPTON. Not that I am aware of.

Mr. LAMALFA. OK, good, good, just making sure you keep funding.

Mr. Bahrami, do you have any input on it, as well?

Mr. BAHRAMI. Sir, I just want to point out that we are supportive of contract towers, and we are currently revising our cost-benefit analysis for contract towers. And my role, my organization's role, is to oversee ATO. And we are making sure that those particular towers are safe and operating. And at this point I have to tell you that everything is working fine, and it is safe.

Mr. LAMALFA. OK, thank you. Let me follow up on the drone question, as well. You know, coming back to the very rural needs we have, and remoteness, it is a great tool, used properly, for inspection of hard-to-get-at power lines and, you know, some roadways, or maybe under bridges. A lot of infrastructure, where it is a very handy tool.

So, what are your thoughts that we can—instead of—in certain areas I see what the issue is. But others, we need expanded use of this. We need better permission to use them, maybe even an out-of-sight basis, as is appropriate, because we have a lot of issues with timber, timber that could be—you know, we have 129 million dead trees and counting in California, with the interface of that—with power lines or just other issues.

So it is certainly a lot better way to keep abreast of what is going on with dead trees and other infrastructure issues.

So what do you think we can do to expand the use of that, where appropriate, in those types of very rural situations?

Mr. BAHRAMI. I fully agree with you, that we have to use a risk-based approach to deciding on operational applications, and using it in areas that are not heavily populated makes a lot of sense. And we are doing that. When you look at the process that we have in place through the waiver process under part 107, we have issued many waivers for those types of operations.

Also, on the integration pilot program, we are soliciting input from those interested applicants who want to introduce new and innovative applications. The idea behind it is, of course, to continue to promote the UAS and also make sure that we learn from those experiences and apply it appropriately.

Also, as I mentioned earlier, we are in the process of proposing a rule that facilitates operation over people and at night, and that will significantly reduce the number of waivers that we have currently in house, and working on that. Going forward with ID, remote ID, we could actually address the concerns that we have from our security partners, and we can move forward. All of that——

Mr. LAMALFA. Quickly, quickly——

Mr. BAHRAMI [continuing]. Is going to help.

Mr. LAMALFA. Quickly, quick question on—just a quick one on do we want to have States and locals have their own sets of rules, or do we want to keep this kind of a more broad approach with one Federal jurisdiction, instead of multijurisdictions having their own rules?

Mr. BAHRAMI. One of the important benefits of the IPP [integration pilot program] is to actually evaluate what needs to be done with the State and local authorities with respect to their jurisdiction, and what we can do under Federal rules and regulations. What we learn from that actually is going to help us, moving forward, with the very same issue that you highlighted.

Mr. LAMALFA. OK, thank you. I appreciate——

Mr. DAVIS. The gentleman's time has expired. The Chair recognizes the gentlelady from Texas, Ms. Johnson, for 5 minutes.

Ms. JOHNSON. Thank you very much, Mr. Chairman. I really do appreciate the perspectives of the—at NASA on the importance of aviation safety research, and the partnerships that are required between the Federal Government and industry.

As ranking member of the Committee on Science, Space, and Technology, I believe that research is absolutely essential to developing unbiased practices and techniques that we can deploy to mitigate risk.

Can you, Mr. Sultan, speak more to the value of these partnerships between the Federal Government and industry, and identify

areas where the Federal Government could benefit from additional resources to address the emerging challenges in the aviation space?

Mr. SULTAN. Thank you for the question. So in regards to the partnerships between Government and industry, it is absolutely critical. Because for us in the NASA research, first of all, we use it as a guiding principle in trying to determine what are actually the community needs, what are the tall poles that the eventual users of our systems will need and will apply? So, getting that feedback is critical.

In addition, as we develop these systems, it is critical to be able to constantly evaluate the benefits of our research products in the operational environments as exercised by the users.

A good example I can give is, for instance, on our development of prognostic tools for data mining, using the data mining of the data that is within the ASRS data—we work extensively, for instance, with Southwest Airlines out in Dallas, where they exercise our algorithms and provide feedback in terms of how useful they are and what additional safety issues those tools and algorithms unearthed that were otherwise unknown. So these are kind of examples that I can provide.

Likewise, when it comes to UAS, these small operators, they have tremendous capability in terms of being able to provide capabilities, in terms of detect and avoid and communication capabilities that already exist in other realms, not just aviation, that can be brought to bear. So we work quite extensively with—I mean you can look at it in terms of the IT sector on how far advanced certain capabilities are, and can we leverage those to essentially apply it towards the aviation community.

Ms. JOHNSON. Thank you very much.

Mr. Bahrami, we have probably the safest system in the world, in terms of our safety record and our complex aviation system. Your testimony speaks to investing in the right safety enhancements by aviation industry. It is my belief that probably Congress should not dictate whether to invest in a particular technology. Rather, it should encourage the FAA to establish technology-neutral standards for industry to pursue.

Given that the United States has already deployed a comprehensive network of ground-based ADS–B receivers, and there is a mature ATC modernization outlined in the NextGen roadmap, what is the benefit of space-based ADS–B for the United States? And how does that benefit, compared to the projected cost of space-based ADS–B on the annual basis?

Mr. BAHRAMI. Thank you for the question. As you know, this was one of the mandates, that we have to study the benefits of the space-based ADS–B. And that work has been going on for some time. And I think, once we have the information, and through the NextGen Advisory Committee, and recommendations that will come to the FAA, we will decide what we can do.

At this point I can see how you may feel that there would be duplications. We already have a system in place. But until we have the experts taking a look at that to see if there are other places that we are—we do not have coverage and we could get that through the—space-based ADS–B, at this point I can't make any more comment beyond that.

Ms. JOHNSON. Thank you very much. My time has expired.

Mr. DAVIS. Thank you. The Chair now recognizes the gentleman from Michigan, Mr. Mitchell, for 5 minutes.

Mr. MITCHELL. Thank you, Mr. Chair.

Captain, let me ask you a couple of questions, if I can, please. My colleague gave you an interesting question, a closed choice between an FAA reauthorization without ATC modernization of the current system, which, of course, isn't necessarily the choice, so I am going to ask you a different question.

If you had the choice between the 21st Century AIRR Act with ATC privatization, simply FAA reauthorization without ATC—leaving it the way it is, or the progression it is on now, and the current system, which one do you want to have?

Mr. CANOLL. From a safety perspective, it is neutral for us. We believe that with or without the reform, we are going to maintain the safest system we have. If the question is not based on safety, we are looking at a profound need for a long-term, stable source of funding for our air traffic control system. We believe the one that is being offered now will provide that in the current House action.

Mr. MITCHELL. Which is the 21st Century AIRR Act, correct?

Mr. CANOLL. Yes, sir.

Mr. MITCHELL. OK. Mr. Bahrami, I am confused, but I believe your agency actually supported the 21st Century AIRR Act, did it not?

Mr. BAHRAMI. Administration, yes.

Mr. MITCHELL. That would be the pertinent question.

Mr. BAHRAMI. Yes.

Mr. MITCHELL. Thank you.

A question for you, if I can, Mr. Hampton, before I have to leave for another—quite some time ago, after 9/11, the FAA was directed by law to update and upgrade the identification process for A&P and pilots, so they had more information in terms of photos, biometrics to better secure access to airports.

To date, to the best of my knowledge, that really hasn't been—let's put it this way—significantly undertaken, let's put it that way. And I guess—I know there is another committee on which I serve is going to get into detail. Can you give us an outline as to—I think that is a safety risk that we need to look at.

Mr. HAMPTON. I would have to get back to you on the biometrics. Most of our work is focused on the updates on the pilot records database, which is currently underway. And we will get back to you on the biometrics.

Mr. MITCHELL. I appreciate—well, I appreciate that, in terms—and additionally, in terms of identification, their identification information and for A&P and mechanics, which appears to me to be a significant safety risk, where you have the ability for——

Mr. HAMPTON. Absolutely.

Mr. MITCHELL [continuing]. People to access——

Mr. HAMPTON. Yes, sir. We will get back to you. We focus mostly on the pilot records database.

Mr. MITCHELL. I appreciate that.

Mr. HAMPTON. Thank you, sir.

Mr. MITCHELL. I think it is a significant safety concern we need to be concerned about, is the safety of our——

Mr. HAMPTON. Interesting. We just had a discussion with another committee about that. I will get back to you, sir.

Mr. MITCHELL. Thank you, sir.

I yield back, thank you.

Mr. DAVIS. Thank you, Mr. Mitchell.

As a followup, Captain, to Mr. Mitchell's question, you mentioned a stable funding source that you believe the 21st Century AIRR Act would provide. That stable funding source, would you agree, would allow more safety upgrades and technological upgrades, to make it safer for everybody in the industry?

Mr. CANOLL. I don't necessarily agree that more funding is going to make us more safe. I think we are safe now. The funding would be more along the lines of expanding and making it more efficient. The safety is going to be maintained. That is an absolute, and it is an absolute requirement. We are not looking for new ways to be safe. But if we are going to continue to have the safety we experience today with increased volume, which is the objective of a new system, then, yes, we will need more funding.

Mr. DAVIS. The Chair now recognizes Ms. Brownley for 5 minutes.

Ms. BROWNLEY. Thank you, Mr. Chairman.

And Captain, I would like to also ask you a question with regards to pilot shortages, or not having pilot shortages. But we do continue to hear from our regional carriers about a pilot shortage, although the FAA data seems to paint a different picture, in that there has been a 200-percent increase in pilot licenses that have been issued since 2009.

Yet we continue to hear about it, and from both large and small carriers leaving their market. So I was wondering if you could explain a little bit more in further detail about how you think business economics are driving airline service issues in smaller communities.

Mr. CANOLL. So, ma'am, you are absolutely correct. There is no present-day pilot shortage. The FAA data is very clear. There are almost two pilots for every job available out there. The challenge is that the industry went through a rather dramatic downturn in the previous 10 to 15 years, many bankruptcies. And it, quite frankly, wasn't a very desirable profession for almost an entire generation coming through.

The good news is we have seen a turnaround in the industry, from a profitability standpoint. And when our employers are profitable, our members make more money. So that is now attracting a new generation of fliers. And we have seen enrollment at the flight schools up dramatically over the last 2 years. We have seen the production of airline transport pilot and restricted airline transport pilots increase, so the trend is very positive on the long-term picture.

For those who are having troubles attracting pilots today, they just need to look at those airlines that are not having troubles attracting pilots. And it is the free market at work, which we fully support. We fully support the activity of the free market. And while some are having no problems, we can see clearly why they pay a good wage and they have a good work-life balance and they have good career progression options for the incoming pilot. And those

who are having trouble do not, in almost all areas. It is almost that simple: supply and demand market economics.

Ms. BROWNLEY. And is there a certain profile of the new pilot coming on board?

Mr. CANOLL. So the pilots that we see today coming into the part 121 carriers are products of the new rule, since it has been in place for almost 5 years now, and that new rule calls for very structured academic training, and then a certain baseline, depending on which form of structured academic training you had. Let's say it was a 2-year aviation degree. You would need 1,250 hours of experience. A 4-year aviation degree, you would need 1,000 hours of experience. But if you came from the military, you could obtain a restricted ATP [Airline Transport Pilot] with 750 hours. So we are finding that those structured programs and that experience is producing a very high-quality candidate.

We went through a transition period right after the rule came in, where we had some people coming back into the industry who already had ATPs, but hadn't flown for many, many years, who struggled a little bit in the air carrier training course. But we have seen that wane away, and now we are seeing a very high-quality candidate.

Ms. BROWNLEY. Thank you for that. And there has been a lot of discussion today on unmanned aircraft in our national airspace. And I am just wondering, from your perspective—I haven't heard your perspective yet, although I heard you make comments in your testimony. But how do you see the Federal Government's role in developing, you know, flight standard, certification, air traffic requirements for the use of drones in our airspace?

Mr. CANOLL. So the Air Line Pilots Association is fully supportive of the development and deployment of these technologies, just as quickly as possible, as long as safety is not compromised.

From a systematic approach to it, we look at it very simply. If the vehicle under consideration is intended to fly into the national airspace—which I define as airspace shared by our general aviation community and our airlines in the military—or the vehicle has the capability to do it in a lost link concept, then the development of procedures, certification, and operation of that vehicle must be very much aligned with what we do today in manned aviation. It shouldn't be a new set of standards. The standards exist for operating in the national airspace. We need to have those same standards.

One example would be collision avoidance technologies that are mandated on all the airliners my members fly. That type of equipment must be installed on any unmanned vehicle that is intended to fly in the national airspace, as well.

Ms. BROWNLEY. Thank you, sir. My time is up. I yield back.

Mr. DAVIS. The Chair recognizes the gentleman from Minnesota, Mr. Lewis, for 5 minutes.

Mr. LEWIS. Thank you, Mr. Chairman. Thank you to everyone who is appearing in front of the committee today. We do appreciate it.

Administrator Bahrami, I have got a question on the 21st Century AIRR Act and how it applies, or some of the criticism that has been expressed on the other side of the aisle from moving air traffic

control from the FAA to a nonprofit private entity. And I would reiterate the point that this particular piece of legislation has nothing to do with privatizing profits. They don't go to the stakeholders, they are reinvested back into the system. But it is just a more nimble way to make certain that air traffic control is up to date, and just merely the model of so many other nations.

But nevertheless, some of my—our colleagues on the committee have expressed concern about managing airspace and aviation operations, and doing that the right way.

Now, I want to ask you a question about how the FAA currently contracts with private general aviation pilots. I understand there is a couple of contractors that we already use that are outside the realm of Government. Is that true?

Mr. BAHRAMI. Sir, I am not familiar with the specific contracts you are referring to.

Mr. LEWIS. Yes, go ahead.

Mr. BAHRAMI. If you want to either elaborate or give me the questions, I will make sure that I provide you the response.

Mr. LEWIS. Right now the FAA contracts with folks like Leidos, which has a presence in my district, in Minnesota, to run the flight services center which aids all general aviation pilots in planning and executing flights in the national airspace.

And I guess my question is, if that is good enough for that, what would be the fear in the 21st Century AIRR Act for moving to a similar model?

Mr. BAHRAMI. Earlier there was a question with respect to the contract towers, and we mentioned that this is something that we support. We are supportive of the contract towers. And my focus is on safety.

And I want to point out that, from the safety perspective, the ATC reform that is included in the proposed act, there would not be any adverse impact to safety. That is my belief. And I base that on the fact that there are 60 or so countries that have already done that, and the level of safety, based on various studies decided that it stayed the same or has improved.

Mr. LEWIS. So there are these successful examples. I believe, additionally, the FAA recently established the LAANC [Low Altitude Authorization and Notification Capability] program, is that right, that approves private-sector, third-party companies to manage unmanned aviation in specific other areas to make certain that our national airspace is safe?

So there are examples of non-Federal entities operating portions of the national airspace in a very proficient and safe manner, correct?

Mr. BAHRAMI. LAANC, you mentioned, is a good example of that. It has been working very well. And we are looking forward to expanding it to 50 other airports.

Mr. LEWIS. And the FAA still retains safety oversight of these programs, as it would the ATC, if it were operated independently. Is that correct?

Mr. BAHRAMI. That is correct. The responsibility of oversight is always with us, sir.

Mr. LEWIS. Very good, thank you.

I yield back, Mr. Chairman.

Mr. DAVIS. Thank you. The Chair recognizes the gentlelady from Michigan, Mrs. Lawrence, for 5 minutes.

Mrs. LAWRENCE. Thank you so much.

Captain, in your testimony you talk about how we need to ensure that safety regulations should not be driven by economic decisions. Can you elaborate on that?

Mr. CANOLL. I think the easiest example is if you listen to some of the chatter in town, and certainly in this subcommittee as well, about those who believe there is a need to reduce the number of hours required or the structured training that is currently required for an ATP or restricted ATP. Those are attempts to address a market forces issue with regard to pilot supply with a safety provision, which I do not believe is what the flying public wants us to do.

If you look more on the economic side, it is a problem for the industry that we are going to have to work through together to provide service to small communities at an affordable rate.

We are not blind to the fact that if the airplanes cost more, the fuel costs more, the pilots cost more, eventually the cost of that operation to a small community will make it unaffordable for those who want to access that. Hence the Essential Air Service and other programs that are meant to offset some of that cost.

So I think, you know, a lot of attention could be focused on that, to see if we can find ways to make it more affordable to fly into those things. But reducing safety—and, by the way, we are firm believers that just reducing the number of hours or reducing structured flight training will not address the problem of attracting pilots to the job. That is not going to solve the problem, no matter what anyone says. I know what attracts pilots to the job, and it is a good work-life balance, career progression, and a fair wage.

Mrs. LAWRENCE. Captain, I want you to know that I agree with you. And so many things that—so often, when Government looks at associations or unions or labor groups, they are labeled as the other side, where you are the ones—you are flying that plane, you are in that seat. You have the ability to speak at a level of expertise that we need to hear. And I just want you to know I do appreciate you, and because all of us fly a lot, we are so appreciative of your service, sir.

I want to ask this question to the panel. I don't think it is an exaggeration to say that the hurricane response—we will look back on it as a landmark evolution of drone usage in this country. The University of Michigan's College of Engineers is building an outdoor fly lab for testing autonomous aerial vehicles called the M-Air.

I wanted to ask this panel what are some of the challenges faced by educational institutions today, as they look at R&D in the UAS airspace?

Mr. BAHRAMI. I will start. In terms of challenges, I think there are tremendous innovative ideas out there. And often what we are learning is the best way to go forward is through prototyping, and actually put those ideas in place and document what lessons we learned, and identify those things that maybe we did not know prior to conducting that particular research.

And to some degree, collaboration with the Government agencies, industry, will help identify the research requirements, going for-

ward. And I think that is how we can take what is happening in academia, and actually transfer it into regulatory and safety requirements.

Mrs. LAWRENCE. And in that vein, to ensure that we do not stifle this industry, what are some of the recommendations that you have when it comes to regulations, the timeframe? We often hear that our regulations stifle the growth. And this industry is moving very rapidly. Do you have any recommendations for us?

You all are not into the drone industry?

Mr. CANOLL. Ma'am, I sit on the Drone Advisory Committee. I am a member of the Drone Advisory Committee.

Mrs. LAWRENCE. Thank you.

Mr. CANOLL. And we struggle with that question every day.

Mrs. LAWRENCE. OK.

Mr. CANOLL. The industry wants a lot of things. They want flight beyond visual sight, they want flight at night, they want flight over populations. These are all very desirous of the industry to make more money. But we also have to take a focus on all the challenges to doing that safely.

The most recent example of success is the UAS ID and Tracking ARC results on—in that ARC—we were a member of that Aviation Rulemaking Committee, as well. It went wonderful, and now the FAA has those recommendations, and we should be seeing rulemaking in very short order, which will enable a lot of the things the industry wants to do. That is the first and most present example of if we are actually making progress. As long as the industry and the FAA keep coordinating at the very high level they are doing right now, I think we are going to get there. You know, we are going to have to be measured, but we are going to get there.

Mrs. LAWRENCE. Thank you so much. My time is up and I yield back.

Mr. DAVIS. The gentlelady's time has expired. The Chair begrudgingly recognizes the gentleman from Pennsylvania, Mr. Perry, for 5 minutes.

Mr. PERRY. Well, thank you, Mr. Chairman. I appreciate your indulgence, begrudging indulgence.

Gentlemen, thanks for being here. I am going to stick with the line of questioning from the gentlelady from the great State of Michigan. And let me just say before I start that I was encouraged that the committee adopted an amendment I had last year, the reauthorization bill which provided the Administrator the authority to part 107 waivers for UAS carrying property beyond the line of sight.

And I will also tell you, as a rotary-wing guy who operates in the low-altitude airspace, I am particularly concerned about getting this right here on a regular basis, especially from my friends in the EMS community about close encounters, because they seem to just—you know, they are headed to an accident, and so is everybody else, right? And they want to have their own view of it, and so on and so forth.

At the same time, I think that potentially we are getting behind, we are behind, we are missing opportunities in this space. And I just want to encourage us to continue safely in this regard, but diligently.

I was pleased to know that the DOT and the FAA place strong emphasis on the application and the roll-out of the new UAS integration pilot program, so I just want to—UAS IPP is the acronym, just to be clear here.

Mr. Bahrami, acknowledging package delivery is, for the time being, prohibited under part 107. How does the FAA envision enabling delivery operations in the pilot program? Do you know if that is part of that, and how that is being worked out? Or where does that stand?

Mr. BAHRAMI. At this point I am not familiar with all the proposals. We are going through the process, as you know. We are following a very strict process. But I can tell you that, even outside the IPP, there are companies that have already approached the FAA. And we are going to be working with them to identify the operational rules that need to be in place for those types of operations.

And there are two ways we could deal with this situation. One would be for us to start looking at the regulations and come up with a proposal that goes out for public comments and all that. But the other way would be to engage with industry and let them propose ideas that are workable, given their nature of designs, and put the safety requirements, performance-based rules, that then actually can go forward and design their vehicles to those type of requirements.

We have chosen the latter. We want to work with them because we believe that would be the quickest way for us to learn some of the challenges that we are going to be facing.

Mr. PERRY. Right. And I agree with you. I hope they are not mutually exclusive. I think that we should engage with industry as the experts on this. But at the same time, I think the public comment is important. As a person who is fairly familiar, I consider myself, having flown for 30 years, familiar with the aviation process and so on and so forth, but I am also concerned about privacy, about the airspace incursions, whether for safety or for privacy, what have you. And I think those are important conversations to have. I would encourage you to continue.

I understand that DOT is required to enter into UAS IPP agreements with at least five jurisdictions by early May. That is my understanding. So if I am wrong, just please correct me. Do you anticipate a program being announced by then, or not?

Mr. BAHRAMI. I can tell you that we are on schedule.

Mr. PERRY. OK.

Mr. BAHRAMI. And I can also tell you that Secretary Chao recently announced that the number would be 10. We are doubling the numbers.

Mr. PERRY. Excellent, OK. So on schedule, doubling the numbers. I think this is good news for those of us that are interested in this. And whether—just like you said, Captain Canoll, we are concerned for safety and the airspace and interoperability and a traffic management system. Nobody wants a 50-pound metal object coming through the windscreen at whatever hundred miles an hour you are headed. It is going to be catastrophic, right? So we can't afford those kind of incidents. But at the same time, we need to move for-

ward with technology and the things that are in our world today, and just do the best we can.

So I appreciate your answers today, sir, and I thank you for your diligence, gentlemen. Thank you.

Mr. Chair, I yield.

Mr. DAVIS. Thank you to my good friend, Mr. Perry. The Chair now recognizes the gentleman from Tennessee, Mr. Cohen, for 5 minutes.

Mr. COHEN. Thank you, sir. This has been the greatest period of safety in civil aviation, I think, in our history. And yet we have got the largest, most complex system. So thank you for that. But we still have to remain vigilant to maintain those high safety standards which we have established in the United States.

Mr. DeLisi, if I can ask you on—if you recall, October 28, 2016, American Airlines flight 383 experienced an uncontained engine failure and subsequent fire. There were 161 passengers, 7 flight crew on the plane, 168 people. Several injuries were sustained, and NTSB subsequently issued an extensive investigation.

First, Chairman, can I have entered into the record the investigative report on that record, without objection?

[Pause.]

Mr. COHEN. Without objection? Thank you.

Mr. DAVIS. Yes.

[The 91-page accident report referenced by Congressman Cohen entitled "Uncontained Engine Failure and Subsequent Fire: American Airlines Flight 383, Boeing 767–323, N345AN, Chicago, Illinois, October 28, 2016" is available on the website of the National Transportation Safety Board at https://ntsb.gov/investigations/AccidentReports/Reports/aar1801.pdf.]

Mr. COHEN. Thank you.

Mr. DeLisi, you are familiar with the NTSB's investigative report regarding the flight? There were 168 people on board. Was that the capacity of that plane?

Mr. DELISI. I would have to check into that. I don't recall if that was a full flight.

Mr. COHEN. So you don't know how many passengers could have flown that plane or a similar flight. Not necessarily.

Mr. DELISI. I could find that.

Mr. COHEN. Thank you.

Mr. Bahrami, let me ask you this. In the investigative report following the accident, the NTSB recommended—some passengers evacuated and they took their carry-on bags, and that is a problem. They shouldn't have done that. Does the FAA consider the efficient, timely evacuation of planes an important factor in passenger safety, and how to accomplish that?

Mr. BAHRAMI. Absolutely. We have specific rules that—emergency evac must be completed within 90 seconds. And when we conduct that test, we have the maximum passenger loading on—and adverse situations, such as some of the exits are closed and those kinds of situations, to make sure that we get as realistic as possible to potential scenarios that may happen in service.

Mr. COHEN. Thank you, sir. Ninety seconds is what current Federal law requires all passengers to be able to evacuate.

In the case of flight 383 it took 2 minutes and 21 seconds to evacuate the passengers. Three exits were operable. The flight was below passenger capacity, yet it took 51 seconds longer, or 63 percent more time than is permissible under Federal regulations.

Subsequent to that, post to that, a U.S. circuit court decision was issued in July of 2017. And Mr. Chairman, I ask unanimous consent to enter into the record the U.S. court of appeals decision of July of 2017.

Mr. DAVIS. You didn't get me this time. Without objection.

[*Flyers Rights Education Fund, Inc. D/B/A FlyersRights.org, and Paul Hudson, Petitioners* v. *Federal Aviation Administration, et al., Respondents* (D.C. Cir. July 28, 2017) (No. 16–1101) is on pages 124–146.]

Mr. COHEN. Thank you, sir.

You are familiar with that decision, I presume, *FlyersRights* versus *U.S.A.*?

Mr. BAHRAMI. Yes, I am.

Mr. COHEN. In that decision the panel remarked that the FAA's justifications to reject the public petition to review airline seat safety as a matter of safety risk was vaporous. Even after the dangerous accident involving American Airlines flight 383, even after the NTSB's clear recommendation to review passenger deplaning times, the FAA took no significant action.

Now the U.S. court of appeals has ordered the FAA to take action to review the safety impact that changes in seat size and pitch may have. I am concerned the FAA has not taken seriously the concerns of the National Transportation Safety Board, or even the U.S. court of appeals decision, or this committee, which included a study.

Can we expect some study soon on pitch size and width of seats that are getting smaller and smaller and smaller?

Mr. BAHRAMI. As you mentioned, we have the court order to respond, and we are working on that response. It is a coordination. And I think, once that is made public, we know what type of work we need to be doing in order to satisfy the directives that we have.

Mr. COHEN. Well, I hope you will do it quickly, because lives could be in the balance. I am deeply concerned about the flight safety for the flying public. We shouldn't wait until somebody dies to respond and to take action to make our planes evacuatable within the 90 seconds that is required by law.

Seat size and pitch continue to shrink, while the average American gets larger and larger and taller and taller. And while I care about comfort, my bill, the SEAT [Seat Egress in Air Travel] Act, is focused squarely on the risk of the flying public and safety. This was part of the FAA reauthorization package.

Even if airlines did not oppose the amendment, which they didn't—everyone is for safety—I think it should be a grave concern of the American public that the FAA has repeatedly failed to act in accordance to the guidance and recommendations of not only the National Transportation Safety Board, but even the U.S. court of appeals. It is clear to me the American public is on our side in urging your agency to issue standards to keep Americans safe in our skies. And pitch and width is part of that, Mr. Bahrami, and I hope this administration will do that.

If I can have just an extra second, Captain, I want to thank you for your service——

Mr. DAVIS. No.

Mr. COHEN [continuing]. And ask you this. Do you carry a gun in the cockpit?

Mr. CANOLL. No, sir, I am not an FFDO [Federal flight deck officer].

Mr. COHEN. OK——

Mr. DAVIS. The gentleman's time has expired, thank you.

Mr. COHEN. I yield back the balance of my time.

Mr. DAVIS. The Chair recognizes the gentlelady from Nevada for 5 minutes, Ms. Titus.

Ms. TITUS. Thank you, Mr. Chairman. I would like to follow up on the question earlier about package delivery. I know that you say that there are some plans that are going to be announced in May. You don't want to tell me if Nevada is going to get one of those proposals, do you, so I can go back with some good news?

But I just worry that all of this is kind of conditional, and it is all in the future, and you are all studying and planning. As the FAA reauthorization continues to be controversial and held up over that one provision about privatization—all the rest seems to have pretty much bipartisan and industry agreement—is there anything that we can be doing to help speed along this drone package delivery?

We just see it happening every day right now, it is a reality in Europe, and we seem to be falling further and further behind.

Mr. BAHRAMI. Let me start by highlighting that we are leading when it comes to integration of drones into airspace. Many countries have chosen to segregate. But what we are trying to do is integrate, which is the—which is—puts us ahead of other countries.

Having said that, as it was mentioned several times, there is tremendous amount of energy, passion, and enthusiasm amongst the companies to move forward with these types of initiatives. Frankly, FAA does not have a choice than to continue to work with those parties and move things forward.

So, we are at the point right now that the demands are upon us to respond, and we are doing so. We are doing it in terms of partnerships for safety plans with specific companies that are in that particular business. We are trying to learn from their work and see what we could do as we move forward.

And at this point I could tell you that that is a high priority for us.

Ms. TITUS. Well, I am glad to hear that. And Nevada has one of the test centers in the State, and there is a lot of potential use for drones there. I know some of our utility companies would like to see them used in remote areas, because that would be very helpful—out of line of sight.

Some of the casinos would like to use drones to deliver drinks poolside. I mean that is—let's be creative. I noticed even in one of the big fashion houses during fashion week they had drones going down the runway, carrying ladies' purses. So, I mean, it is endless. But I appreciate that you all have made that a priority.

One thing, too, that concerned me was this rule of the administration, this two-for-one Executive order on the development of reg-

ulations, and how that affects the drone industry. I wrote Mr. Mulvaney about that, to ask him, and he wrote me back and he said that he thinks maybe that the—he says that the OMB believes that maybe the rulemaking that expands the use of drones would be considered deregulatory, so it wouldn't come under that arbitrary two-for-one elimination.

I wonder if you all have accepted that. Have you received that directive? And does the DOT agree with it, and the FAA?

Mr. BAHRAMI. Yes, we are following the directives outlined in Executive order. And when you view the requirements in there, or the draft, you are looking at two things: first, safety; and the other one is enablers, rules that are enablers. In those cases, we are moving forward with those.

And in the area of what—the rules that are considered deregulatory, which—there are a number of them identified by both industry and other sources. In those cases we have to answer two questions: what is the impact on safety if we go forward with that action, and what is the impact on FAA's roles and responsibilities? Can we still do that job? Those things go into the consideration. And at this point we are following that guidance.

Ms. TITUS. So you don't feel like that two-for-one Executive order is hindering you in the development of drones or regulations that are needed?

Mr. BAHRAMI. Not so far. I think what it does is that it forces us to do a lot more planning, because we need to know what rules we have got going and what are some of the deregulatory items, and be able to match them together so that the net effect is a positive, in terms of benefits, or neutral. And that is the work that we have to do in advance before our regulatory agenda is published.

Ms. TITUS. Thank you. Thank you, Mr. Chairman.

Mr. DAVIS. The gentlelady's time is expired. Glad I get a chance to ask my questions. You know, many that I had actually have been asked already. So it has been pretty interesting to listen to some of my colleagues. My good friend, Mr. Larsen, and I, we kind of stopped when we heard about technology delivering drinks to the pool. So we would like to get some opinions on—can you push that technology to the head of the line with your risk-based approach, sir? A simple yes or no is good.

Mr. BAHRAMI. We will do our best.

[Laughter.]

Mr. DAVIS. Thanks. Speaking of—a lot of this hearing I don't think many originally thought would center on drone and UAS technology, but I just want to let you know I appreciate the FAA's risk-based approach on UAS, and I look forward to continuing to work with you.

As you may know, and many on the panel may know, I introduced an amendment to the 21st Century AIRR Act that would create a microdrone category. And I would hope that that language is being utilized as part of your risk-based approach, as part of any advisory committee that you may be a part of, Captain, because my feeling is that manufacturers will begin to manufacture that technology in a much more safer way for our air system if they know what the minimum standards are. And that, to me, would ensure that we would keep that technology moving forward.

Mr. Bahrami, I also wanted to ask you for an update on a piece of legislation that was signed into law back in 2016. It is section 2309 of the FAA Extension, Safety, and Security Act of 2016. I had a provision based on my legislation, the Families Flying Together Act, which required DOT to review and, if appropriate, establish a policy requiring air carriers to enable children to sit with a parent or an accompanied family member.

The deadline for implementation was July 15, 2017. Do you have an update on this?

Mr. BAHRAMI. Sir, consumer protection issues are handled by the Department of Transportation, and I will be glad to take the question and provide you with an update.

Mr. DAVIS. All right. And in—thank you for doing that, I appreciate your relaying that to the DOT Aviation Consumer Protection Division. If you could, would you ask them to reach out to my office? And I would love to schedule a meeting to get a personal update from that team.

Mr. BAHRAMI. Absolutely.

Mr. DAVIS. All right, thank you.

Mr. BAHRAMI. Thank you.

Mr. DAVIS. Captain, you mentioned something. I don't remember—the hearing has gone on long—if it was your opening testimony or if it was in response to one of the initial questions, but you mentioned student loans and the debt that pilots may incur. Do you know what the average student loan debt is for a pilot going into aviation, coming out of training?

Mr. CANOLL. No, sir, we don't. I don't. We don't keep those statistics. We do know it is expensive. And the problem with the traditional student loans is the current system of caps and forbearance.

So in the higher education bill, we are urging a broader look at how student loans could help an individual interested in, let's say, being a pilot, factor in the higher cost that flight training is going to have to be included. And that would mean higher caps for that particular profession, like it has provided in other professions, and then maybe a different mechanism for forbearance on the repayment of those loans. Still a loan construct, still not the best way to do it, because loans are expensive. But nevertheless, the only way for a lot of people.

Mr. DAVIS. Well, I appreciate your comments on the forbearance issues and the Higher Ed Act, but I want to bring your attention to a bill that I have introduced called the Employer Participation in Student Loan Assistance Act. And what it does, it sets up a voluntary, private-sector approach that would allow for a company to receive a tax benefit to offer up to a little over $5,000 per year to an employee. And the benefit would be the employee wouldn't be taxed on it, either.

So it is something that could get us to pay down student debt even more, and allow it to be negotiated as part of a benefits package. So I would love for ALPA and any other organization, the Allied Pilots Association, and Southwest Airlines Pilots Association, and all of the different pilots organizations to take a look at that, because it is an idea that I think could help get much of that debt off the plate of some of your youngest pilots, and give them a chance to go into your profession easier.

And if you look at polling, millennials right now, the biggest concern they have is student loan debt.

Mr. CANOLL. Yes.

Mr. DAVIS. And they are not going to go into an expensive profession to get that education like aviation if we don't give them this assistance. So take a look at that. I appreciate the opportunity to bring that up. Thanks for your comments.

Mr. CANOLL. Yes, sir.

Mr. DAVIS. And I will yield back the balance of my time to Mr. Larsen, very quickly.

Mr. LARSEN. So Mr. Chairman, without objection, I would like to enter a letter into the record with 443 signatories of folks who oppose any attempts to privatize the air traffic control system, including the Washington Pilots Association from the great State of Washington, just to show the wisdom of this move. So I would like to enter this into the record.

Mr. DAVIS. No.

[Laughter.]

Mr. DAVIS. Without objection.

[The letter referenced by Congressman Larsen is on pages 147–154.]

Mr. LARSEN. Thank you.

Mr. DAVIS. The Chair recognizes the gentleman from California, Mr. DeSaulnier, for 5 minutes.

Mr. DESAULNIER. Thank you, Mr. Chairman. And I want to thank the chairman of this subcommittee, the ranking member, and the ranking member of the full committee on their opening comments in mentioning an issue that is very important to me and the residents of the San Francisco Bay area, and acknowledging those incidents there.

And I want to also thank, first, the captain and your association for being so great for myself and my staff to work with. I have had a lot of input from your members individually and when you have come to see us on the issue of runway incursions and near misses. I have learned a lot.

Then I want to acknowledge both the NTSB and the FAA. My initial contacts, to be honest, were not as productive as I thought. But subsequent to that, I really appreciate the meetings.

So I say this in a tone, first of all, acknowledgment that there is a problem. And although I get now in regular—still followed very closely by the bay area media, it was on two stations this past weekend—and trying to put it in context, that we should acknowledge the safety record. But on the other hand, we should be doing everything to make sure that what is happening is not a regression of the means, that we are so comfortable with our safety record that we are not looking at these near misses and learning from them.

So, Mr. DeLisi—and thank you for your career. I have great admiration for what you have done and the value you have given to the traveling public. So I want to talk a little bit about your most wanted list issue area. First, you mentioned that expanding use of recorders, both audio visual and voice and other recorders, are on your wish list. So could you expand on that?

And what is the cost for us to be able to get that, either the private sector or the Federal Government, to help you with that? And how would that help with these near misses and the runway incursions?

Mr. DELISI. Well, thank you. Certainly in the part 121 airline operation realm, aircraft are equipped with flight data recorders and cockpit voice recorders, the cockpit voice recorders only capture 2 hours' worth of information. They are designed with an impacts, which—they are really a tool for accident investigation. If the airplane is involved in an accident, it will stop recording and preserve the data.

However, in an incident in which the airplane is undamaged, likely power will remain on as passengers disembark, and the next load of passengers will get on board and, very quickly, that data is going to be overwritten. So we know that ICAO is looking at a new standard for 2021 to go to a 25-hour recording standard for CVRs [cockpit voice recorders]. We think that would be very helpful.

In the part 135 realm, we see accidents in which airplanes fall below the threshold of being required to have a flight data recorder. And in airplanes like that, when there is not an optional flight data monitoring recorder, there is no way for a company to understand how that flight is being operated. There is no way to monitor procedural compliance and stabilized approach criteria being met. There is no insight. And the accidents that we have investigated recently, like the one in Akron, Ohio, and a more recent one in Teterboro, New Jersey, show that those airplanes are not being flown in accordance with company procedures.

So the push on the part 135 operators is to require a low-cost, lightweight flight data monitoring recorder to allow that sort of monitoring.

Mr. DESAULNIER. So just the jurisdictional issues of looking at these near misses and what the triggers are—we have talked to you and looked at, is it specifics of the airport, why this—at SFO we are pushing, we are very busy, we are happy about that—the design of the airports?

But it does seem that, given all the proper restrictions for privacy and for the good relationships between the operators, the pilots, it—from a lay person's standpoint, if you made sure all of those were consistent, as they are for the voice recorders, you can go to Best Buy right now and get a device that would record the last half hour, so you at least know that conversation and what the human factors were happening in that cockpit when it happened. Could you comment on that?

Mr. DELISI. Yes. We are seeing companies—operators that are voluntarily equipping their fleets with a device like an Appareo Vision 1000 recorder that does video, audio, and some parameters, and it is a great tool for monitoring flights, and it certainly comes in handy, should those aircraft be involved in an accident or an incident.

Mr. DESAULNIER. So it would be helpful?

Mr. DELISI. Yes.

Mr. DESAULNIER. OK. Anything from the FAA in this regard, either the incursions or getting more information from the cockpit?

Mr. BAHRAMI. Well, as was mentioned by Mr. DeLisi, we definitely would like to see as much information as possible, in order to transpire what occurred prior to accident. And recorders—in this case, voice recorder—is one of those tools. And there are other ways to be able to decipher what transpired. And at this point I think we know, historically, any kind of a visual recording has been quite controversial. And if we decide to go that route we have to go through the process and deliberation and discussions before we make any policy decisions.

Mr. DESAULNIER. Well, thank you. I want to thank the chairman, too. I recognize again—and I know I have run out of time—the amazing safety record. However, if that 59 feet had finalized in a tragedy, and if it happens in the future, we are all going to be held to account, which I think would be appropriate. So we want to avoid that.

Thank you, Mr. Chairman.

Mr. PERRY [presiding]. The Chair thanks the gentleman from California. The Chair now recognizes Mr. DeFazio from Oregon.

Mr. DEFAZIO. Thank you, Mr. Chairman.

Mr. Bahrami, I keep hearing about our outmoded radar-based system, and how good it could be, and about the space-based ADS–B. Have we deployed an operable, currently operating ADS–B system that covers the entire continental United States and Alaska and part of the Gulf of Mexico?

It is a simple question. Have we? Is there such a system today that operates?

Mr. BAHRAMI. Yes, yes, of course.

Mr. DEFAZIO. OK. So we have that.

Mr. BAHRAMI. Yes.

Mr. DEFAZIO. Why aren't all the commercial airlines using it? Oh, because they haven't purchased the equipment to use it, is that correct?

Mr. BAHRAMI. Well, it is also the rule is not in effect.

Mr. DEFAZIO. Yes, we didn't mandate it until 2020.

Mr. BAHRAMI. Yes, it is——

Mr. DEFAZIO. That is correct. But it isn't like—that we can't develop the system, it doesn't exist, you know, and we are so far behind. We have it, and we are not using it, because the airlines haven't invested in the equipment because we didn't make them invest until 2020. OK?

Mr. BAHRAMI. That is right.

Mr. DEFAZIO. Thanks. So that is one of the myths here that is a bit disturbing.

Now, Captain Canoll, I understand the frustration and I understand the frustration of others, because of idiots in Congress who adopt things like sequestration and shutdowns and apply it to programs that are fully funded. That is easily solved. All we have to do is take the current system of funding off budget.

But you are supporting a bill that actually reduces the revenues by $8 billion over 10 years to support the air traffic control system. The pilots will have a place at the table, the airlines will have a place at the table to determine what new fees will be paid by passengers or airlines.

How are you going to raise $8 billion? The ticket tax goes away, 80 percent of it. That is how we fund the system now. That is $9.9 billion over 10 years. Eighty percent goes away. We have just lost $8 billion. And the airlines are going to raise their tickets by 7.5 percent, just like they did when then-Congressman Mica let it go when we temporarily suspended the tax because of some dispute he was having. For 3 weeks, every airline in America, except Alaska, raised their tickets 7.5 percent, got a windfall of $400 million. That didn't go into the trust fund. This time they are going to get a windfall of $8 billion when they raise their ticket taxes.

How do you, as, you know, your organization, as one of the organizations supporting this bill, intend to raise the $8 billion from passengers or airlines after privatization takes effect?

Mr. CANOLL. So our concept, or our policy, requires that the test be applied to ensure that any fee structure that is put in place in a successor organization is fair. And we——

Mr. DEFAZIO. Would a head tax on passengers be fair? The airlines have just claimed the $8 billion of new windfall, and now they are going to say, "Well, gee, I think we are going to have to say everybody that gets on a plane pays $25 to use the national airspace." Would that be fair?

Mr. CANOLL. That and many other ways might be fair.

Mr. DEFAZIO. Great. So we pay for higher tickets, and you pay to use the airspace every time you fly. And somehow this is an improvement over the current system?

The only problem with the current system is the idiots I work with. That is the only problem. We are raising more than enough money, we have deployed the new system. The airlines haven't bought the equipment. They are not using it. And here we are, saying, oh, we need to privatize.

I mean, seriously. I know that there are some who are saying, "Oh, gee, we might be considering pilot training if—oh, OK, well, all right, we won't consider it."

You know, I don't like the way this place is working right now. And I think there is some groups supporting this privatization who really, in their hearts, don't support it.

With that, I yield back the balance of my time.

Mr. PERRY. The Chair thanks the gentleman from Oregon. Before we adjourn, Mr. Bahrami, can you just—in keeping with the recent testimony and questioning, what is the current general aviation ADS–B equipage rate? Do you have any idea where they stand?

Mr. BAHRAMI. We are—I don't have the exact number, but I can tell you that it is not where we would like it to be.

Mr. PERRY. Can you get back to us with the exact number——

Mr. BAHRAMI. Absolutely.

Mr. PERRY [continuing]. At this time?

Mr. BAHRAMI. Of course, of course, we will do that.

Mr. PERRY. All right. I appreciate that.

If there are no further questions, I would like to thank the witnesses for being here this morning. We appreciate it. Gentlemen, this has been informative and helpful, and we appreciate your time and willingness to come and sit in the hot seat.

With that, the subcommittee stands adjourned.

[Whereupon, at 12:08 p.m., the subcommittee was adjourned.]

STATEMENT OF ALI BAHRAMI, ASSOCIATE ADMINISTRATOR FOR AVIATION SAFETY, FEDERAL AVIATION ADMINISTRATION (FAA), BEFORE THE HOUSE COMMITTEE ON TRANSPORTATION & INFRASTRUCTURE, SUBCOMMITTEE ON AVIATION: STATE OF AVIATION SAFETY, FEBRUARY 27, 2018.

Chairman LoBiondo, Ranking Member Larsen, Members of the Subcommittee:

Thank you for inviting me to appear today to discuss the current state of aviation safety. Aviation safety is the FAA's top priority. We are in the safest period in commercial aviation, and we just experienced the safest year in general aviation. We are actively leveraging our experience from commercial aviation to advance safety in other domains. We remain committed to working with industry and other stakeholders to identify and address risks. With the support of this Committee, we have worked tirelessly to take a more proactive approach that instills a culture of safety – both in the industry and inside the FAA. Additionally, industry's commitment to engage early on innovative ideas, embrace systems safety, place value on compliance, and work collaboratively with us to develop tools and measures, has been critical to our efforts.

The result is the safest, largest, most complex, and most efficient air transportation system in the world. Indeed, there has not been a fatal U.S. commercial passenger accident since 2009. I am proud of the hard work that has gone into providing a basis for achieving this level of safety. Our success in addressing risk and improving safety in aviation during these past two decades is the result of strong and mature safety partnerships between government and industry to pursue safety improvement collaboratively and in a proactive manner.

We have made significant progress, which I would like to share with you today.

Fostering a Culture of Safety

As the aviation system and its components have become increasingly more complex, we know that our oversight approach needs to evolve to accommodate the future state. In the last few years, the FAA has been shifting to a risk management based approach for its safety oversight responsibilities. A key part of this has been safety management systems, or SMS. With SMS, the FAA is taking a smarter, risk-based, comprehensive approach to managing aviation safety. It requires an organization-wide safety policy. It has formal methods for identifying hazards, mitigating and controlling risk, and continually assessing performance.

Under SMS, the FAA is a more data-driven agency. We are leveraging this approach in many areas, particularly runway approaches and landing procedures, and air carrier oversight. Following runway events at San Francisco International Airport last year, in addition to the NTSB investigation, the FAA quickly took action and established a Safety Risk Management Team. The team is composed of members from across FAA and external stakeholders, and was tasked with identifying the causes of the incident, and taking steps to mitigate and prevent similar occurrences.

In 2016, the FAA replaced its air carrier oversight system for aviation safety inspectors. Previously, inspectors used a calendar-based, non-scaling tool to conduct oversight. The FAA is now transitioning to a risk-based, scalable tool that relies on data collection to drive decisions for adjusting oversight plans. We are also working to incorporate the tools needed for inspectors to identify and adjust surveillance during times of rapid growth, or downsizing into guidance and training materials. These steps demonstrate FAA's transition from its legacy oversight model to a data-driven approach – a key part of SMS.

SMS allows operators to structure a system that matches the size, complexity, and business model of its organization. The requirement for part 121 commercial carriers to have an SMS comes into effect on March 9, 2018. SMS gives airlines a set of business processes and management tools to examine data gathered from everyday operations, isolate trends that may be precursors to incidents and accidents, take steps to mitigate the risk, and verify the effectiveness of the program. SMS stresses more than compliance with technical standards. It puts an increased emphasis on the overall safety performance. Most importantly, SMS creates a safety culture that assures hazards are identified, that actions are taken, and that results are measured. Then the process repeats itself. In the business of aviation, safety cannot be an "add-on" – it must be built in. Our stakeholders understand that and we thank the Committee for its support.

Another part of our evolving oversight model is our embrace of a new compliance philosophy, which emphasizes accountability of all stakeholders. It clearly distinguishes between compliance, which is the goal; and enforcement, which is one of our many tools. To emphasize, compliance is expected and required of everyone who operates in the airspace. We recognize our role in assuring the public of a safe system, and we will not hesitate to use strict enforcement where necessary.

I am very encouraged by the results thus far. Communications are now more open and working relationships with certificate holders has improved. Certificate holders are now more likely to call when they have questions; whereas in the past, they were might have been more reluctant to contact the FAA for fear of enforcement action. We are also seeing industry take a proactive approach to address deficiencies, even before being contacted by an FAA inspector. We know that it takes collaboration, communication, and common safety objectives to allow the FAA and the aviation community to come together, to identify system hazards, and to implement

safety solutions. Safety culture is not just a set of programs that can be "established" or "implemented." It is a way of living and working, and it requires the open and transparent exchange of information. That, in turn, requires mutual cooperation and trust.

Transforming the FAA

We are actively working to facilitate policies and management processes that promote a broad safety culture transformation both within and outside of our organization. Two of our biggest service offices, flight standards and aircraft certification, have undergone major realignments to better meet the needs of a changing industry.

Flight Standards Service (FS) plays a vital role in making the U.S. aviation system the world's safest. We want to make sure we maintain that high level of safety. We are in the process of restructuring the FS organization. By moving away from an organizational structure based on geographic locations to an organization built around functions, FS will operate with greater accountability and greater flexibility to adapt to change. The FAA expects the restructuring to yield benefits to both the agency and the aviation community by strengthening our ability to keep pace with changes in the aviation industry. We will also be able to increase our ability to maximize fixed resources, and better ensure that our employees develop and interpret regulations and policies consistently.

Additionally, in July 2017, the Aircraft Certification Service (AIR) was realigned from a product-based structure to a functional alignment. The new organizational structure is designed to enable transformation. The newly created Organizational Performance Division will oversee AIR's roadmap to transformation, and establish and track effectiveness metrics for both the FAA and industry.

With respect to aircraft certification process improvements, the FAA is moving beyond the initiatives that were driven by the FAA Modernization and Reform Act of 2012. The Aircraft Certification Service is transforming to meet the demands of today's dynamic aviation environment by moving to a systems approach. Emphasis will be placed on up front planning for new technologies, risk based level of involvement in certification programs and a robust oversight program. For example, in December of 2016, the FAA issued a complete overhaul of 14 CFR part 23, the rules for small aircraft certification. Instead of prescriptive standards that limit innovation, the new rules define performance-based objectives and give industry the flexibility to determine the best and safest way to meet them. On the international front, we signed agreements with the European Aviation Safety Agency and Transport Canada to accept each other's approvals of Technical Standards Orders and to validate basic approval with no technical review.

In previous hearings, there was discussion about the effectiveness of the Organization Designation Authorization, or ODA, and our use of metrics. Working closely with industry, we developed the ODA Scorecard. The scorecard is used to define mutually agreed measures, identify areas that need greater focus, and identify issues and concerns with respect to FAA and ODA holders' performance. We piloted the program in 2015, and set up a joint FAA/Industry Continuous Improvement team in 2016. In 2016, 40 companies participated. The goal is for our measures of success to show a year-to-year improvement. I am pleased to report that in just over a year, we have realized performance improvements in both FAA certification offices and ODA holders. The results are published on our website. By measuring appropriate indicators and developing action plans to continuously improve joint industry and FAA performance, we are positioned to optimize our involvement with no adverse impact on safety.

Working with stakeholders

With the advent of new entrants such as unmanned aircraft systems, commonly referred to as UAS or drones, and commercial space operations, a balanced approach that involves collaboration between government and industry is needed. We strive to engage stakeholders throughout the lifecycle of policymaking. For example, the FAA's commitment to the safe, secure, and efficient integration of drones and the expansion of routine drone operations requires resolving several key challenges to enable this emerging technology to safely achieve its full potential. Because drone technology is evolving at such a rapid pace, we involve stakeholders in framing challenges, prioritizing activities, and developing consensus solutions. By leveraging this expertise, we ensure that the FAA maintains its position as the leader in aviation safety.

The Drone Advisory Committee (DAC), formed in 2016, is a prime example of stakeholder engagement. Its members include representatives from industry, government, labor, and academia. The DAC allows us to look at drone use from every angle, while considering the different viewpoints and needs of the diverse unmanned aircraft systems community. Our collaborative working relationships with groups such as the DAC will help inform and prioritize integration activities, ensure we remain engaged with industry trends, and maintain clear channels of communication to convey expectations and solicit feedback.

The impressive gains in safety are due in part to the aviation industry and government voluntarily investing in the right safety enhancements. The work of the Commercial Aviation Safety Team (CAST), along with new aircraft, regulations, and other activities, reduced the fatality risk for commercial aviation in the United States by 83% from 1998 to 2008. The CAST model uses data to develop an understanding of the best actions or interventions to prevent

accidents. The goal was to collaborate on identifying the top safety areas through the analysis of past accident and incident data, charter joint teams of experts to develop methods to understand the chain of events leading to accidents, identify effective interventions to address these safety areas, and remain focused on implementing these critical interventions.

CAST has been extremely successful. It has moved beyond the historic approach of examining past accident data to a more proactive approach that focuses on detecting risk and implementing mitigation strategies before accidents or serious incidents occur with a disciplined, data driven focus. Using data from non-accident sources and voluntary reporting programs, CAST has adopted nearly 100 safety enhancements. CAST aims to further reduce the U.S. commercial fatality risk by 50% from 2010 to 2025.

In a related effort, the FAA is working to reduce safety challenges in general aviation (GA) as well. Much like CAST, the General Aviation Joint Steering Committee (GAJSC), which was formed in the mid-1990s, established a data-driven, aviation-safety strategy to reduce fatal accidents in GA. The FAA, industry, and the general aviation community are working together to mitigate the risks that lead to fatal GA accidents. One result of this collaboration is the FAA's policy on non-required safety enhancing equipment referred to as NORSEE. NORSEE encourages GA aircraft owners to voluntarily install equipment to provide pilots with better overall situational awareness.

Working with the GA community alongside industry, the efforts have been successful. We have targeted, and have been working toward, a yearly 1% reduction in fatal GA accidents to bring a cumulative 10% reduction by the close of fiscal year 2018. I am proud to say that we

have already exceeded our original goal, making last year one of the safest years we have had in general aviation.

The collaboration between government and industry, at all levels, has been instrumental to the success we have achieved in the improvement in aviation safety. Our continued success in advancing aviation safety depends on these strong safety partnerships built on trust and the ability to share and protect voluntarily provided safety information. As the work of CAST and the GAJSC has evolved, so has the agency's ability to collect and analyze safety information.

In 2007, the FAA launched the Aviation Safety Information Analysis and Sharing, or ASIAS, program to help transform safety analysis from a forensic approach, looking at accidents and incidents after they occurred, to a risk management approach, allowing for proactive discoveries of safety concerns before they lead to significant events. It took years to establish voluntary safety programs and build trust within the community. Congress has been an important advocate in helping us protect vital safety information. These safety information protections are imperative so that we can continue to provide the environment in which safety personnel are voluntarily providing safety information. This, in turn, provides carriers and government with valuable insight into potential systemic safety issues.

ASIAS partners with CAST and the GAJSC to monitor known risk, evaluate the effectiveness of deployed mitigations, and detect emerging hazards. There are currently 46 part 121 member air carriers, 63 corporate/business operators, five manufacturers and two maintenance, repair, and overhaul organizations participating in ASIAS. The program continues to evolve, and has matured to the point that the FAA and industry can leverage voluntarily provided safety data from operators that represent 99 percent of U.S. air carrier commercial

operations. ASIAS has established metrics that enable CAST and the GAJSC to evaluate the effectiveness of mitigations. It is also expanding to support other areas in aviation, such as rotorcraft.

We also regularly engage with our Federal and international partners to improve safety. Along with our law enforcement partners, the FAA maintains a multi-layered oversight of the aviation system, including its aircraft and airmen registry. This includes a team of special agents from the FAA who work with domestic and international law enforcement partners to investigate cases involving fraudulent aircraft registrations. The agency is constantly working to enhance the integrity of registry information, and is developing a plan to significantly upgrade and modernize the aircraft registration process to make the system more effective.

The online pilot record database is an example of the FAA's and Congress' commitment to establishing an electronic database for pilot records. In December of 2017, the FAA released a beta version of the database. We are deploying the database in phases to ensure minimal disruption to air carrier and operator access to existing pilot records. Initial feedback of the database has been positive. When complete, the database will enable air carriers to easily check the qualifications and background of pilots as part of the hiring process.

As safety management systems mature, our reliance on sound safety analysis to identify risks to the aviation system, mitigate hazards and track safety enhancements, will be key to sustaining a safe and efficient airspace. This type of capability is achieved only through sustained safety partnerships and the reporting of critical safety information among stakeholders. We must collaborate on safety analysis and best practices, and monitor safety performance and implementation of mitigation strategies. SMS, risk-based decision-making, and collaborative

transparent information sharing will be the cornerstone for future FAA oversight and industry's management of the safety risks that affect their operations.

Before I conclude my remarks, I would be remiss if I did not acknowledge the support of Chairman Shuster and Subcommittee Chairman LoBiondo. You have been instrumental in providing the FAA with the direction and necessary resources to maintain our position as a global leader in aviation. I thank you both for your leadership and wish you well as you retire from Congress.

Conclusion

We have been diligent in our efforts to address what is at the heart of your direction: that the system be safe, responsive, and flexible. We have made significant progress in restructuring our organization to adapt to the new business models, while keeping safety at the forefront of any decision. It is because of the collective hard work of the men and women of the FAA, the work of Congress, and stakeholders that aviation is the safest it has ever been. Aviation safety is, and must always be, our number one priority. There can be no compromise on safety. Yet, we do not want to stifle innovation. Working together with all interests, we are confident we can balance safety and innovation. The Administration is committed to working with Congress to foster American innovation and solidify America's role as the global leader in aviation.

This concludes my statement. I will be happy to answer any of your questions at this time.

Ali Bahrami, Associate Administrator for Aviation Safety, Federal Aviation Administration, Responses to Questions for the Record, "The State of Aviation Safety," February 27, 2018

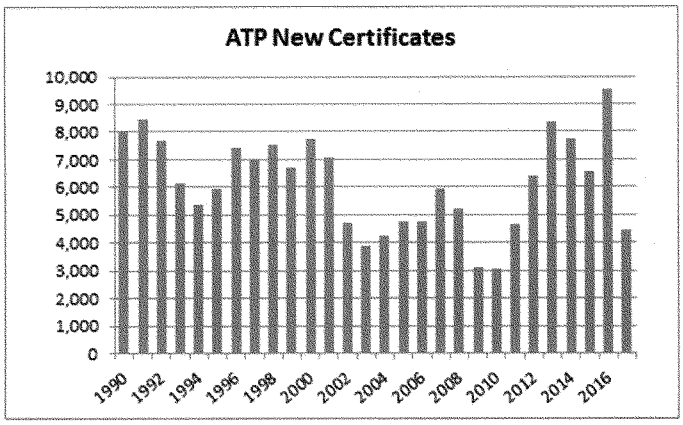
PILOT TRAINING AND QUALIFICATION REQUIREMENTS

The FAA requires all pilots in part 121 air carrier operations to hold an Airline Transport Pilot (ATP) certificate, which requires 1,500 hours of time as a pilot. This is a result of Congressional action through The Airline Safety and FAA Extension Act of 2010 (Pub. L. 111–216), which contained a self-enacting provision for all pilots in part 121 operations to hold an ATP certificate by August 2013. The Act permitted credit towards the 1,500 hours of total time for specific academic training courses. The Act also directed the FAA to conduct a rulemaking to improve the qualifications and training for pilots serving in air carrier operations. The FAA established the new requirements in the Pilot Certification and Qualification Requirements for Air Carrier Operations Final Rule, published in July 2013 (78 FR 42323).

Questions issued by Congressman Sam Graves of Missouri

QUESTION: During the hearing, a member stated that there has been a 200 percent increase in issued pilot licenses since 2009. Can the Federal Aviation Administration (FAA) please validate this figure using data from the U.S. Civil Airmen Statistics database? What has been the rate of change associated with the three main categories of airmen certificates since 2009: private, commercial, and Airline Transport Pilot (ATP)?

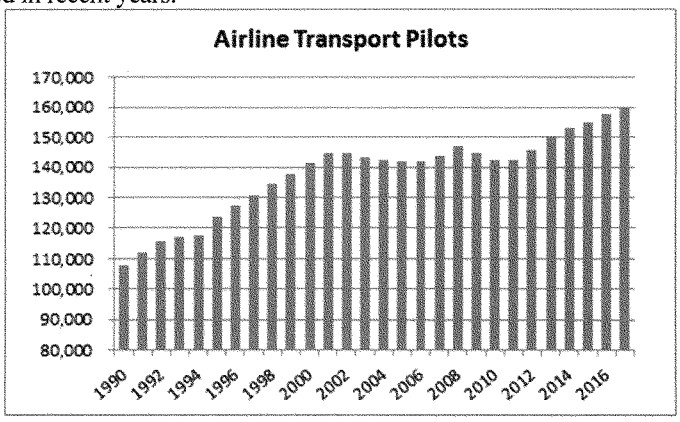
RESPONSE: For ATP certificates, the total number of new airmen certificates issued went from a low point of 3,113 in 2009 to a high point of 9,520 in 2016, which does represent approximately 200 percent increase. The change in total active certificates from 2009-2017 was -23% for private pilots, -22% for commercial pilots and +11% for ATPs. The corresponding average annual change is -3.3%, -3.0% and 1.3% respectively. See chart below.



QUESTION: What trends does FAA's data show for ATP certificates? Do these trends persist through 2017? Will the Agency share any relevant context or factors that may be influencing these changes?

RESPONSE: Since 2010, there has been an increasing trend for ATP certificates held. In 2010, there were 142,198 ATP certificates held. In 2017, there were 159,825 ATP certificates held. See chart below.

Regarding the context for any trends, the Pilot Certification and Qualification Requirements for Air Carrier Operations Final Rule implemented the requirement that all pilots in part 121 operations hold an ATP certificate by August 2013, which may have contributed to the increasing trend. In addition, airline hiring has increased in recent years.



QUESTION: Can the FAA provide context for the ATP certificate spike in 2016, given 2017 numbers are less than half those of 2016?

RESPONSE: The increase in ATP certificates issued in 2016 may be attributed to new requirements established by the Pilot Certification and Qualification Requirements for Air Carrier Operations Final Rule, published July 2013. They also may have increased due to an increase in airline hiring.

Prior to August 1, 2014, there were no training requirements for the certificate, and ATP knowledge test results with a passing grade were valid for 24 calendar months. The rule now requires pilots seeking a multiengine ATP certificate to complete an FAA-approved training course referred to as the Airline Transport Pilot Certification Training Program (ATP CTP), which is a prerequisite for the new multiengine ATP knowledge test.

Prior to the effective date of the training requirement on August 1, 2014, there was a surge in ATP knowledge tests taken. From January 2014 to July 2014, more than 25,000 knowledge tests were taken. The 24 calendar month validity period may have contributed to the increase in ATP practical tests completed in 2016.

QUESTION: A provision in S.1405, currently under consideration in the Senate, contains a provision that seeks to clarify that the FAA has the authority to create additional pilot training pathways under 14 CFR 61.160. Does the FAA interpret this amendment to require it to reduce the flight hour requirements under 14 CFR 61.159?

RESPONSE: The FAA is committed to further enhancing safety by strengthening air carrier pilot training. In Section 217(d) of the Airline Safety and Federal Aviation Extension Act of 2010, Congress provided the FAA with flexibility to allow specific academic training courses to be credited toward the 1,500 hours requirement, should the Administrator determine that it enhances safety more than simply meeting the 1,500 hours requirement alone. After determining that structured academic training integrated with flight training programs enhanced safety, we exercised this flexibility in our 2013 rule, which created additional pathways to meeting the 1,500 hours requirement, including military training and degrees from accredited aviation programs.

As Congress has recognized, there is an important balance between flight training, academic training, and operational experience to ensure that Airline Transport Pilots are equipped with a strong foundation of aeronautical knowledge and experience. We believe that the 2013 rule accomplishes this directive.

The provision in S.1405 currently under consideration in the Senate seeks to add "other structured and disciplined training courses" to the flexibility granted to the Administrator in Section 217(d). Further study is needed in order to determine whether these additional pathways would enhance safety more than requiring the pilot to fully comply with the flight hours requirement.

QUESTION: Does the FAA have concerns about the limitations of flight simulators or view them as a cost-effective training tool that should be utilized to the maximum extent practicable? Additionally, today's pilots build the vast majority of their hours to qualify for an ATP or Restricted-Airline Transport Pilot (R-ATP) certificate as certified flight instructors. Is it FAA's experience that Certified Flight Instructors (CFIs) are regularly building flight hours in variable conditions that would adequately prepare them to be an ATP?

RESPONSE: Use of training devices to supplement on-aircraft training and maintain proficiency is widely accepted within the aviation community. There is a vast range of approved and qualified devices available to training providers for use in flight training. Use of the devices is cost effective by reducing time needed in an aircraft to become proficient in a given task. It also enhances safety by allowing exposure for pilots to emergency situations and difficult operational conditions that cannot be safely accomplished in an aircraft. Current regulations limit the amount of credit a pilot can take for time in training devices that can be used toward pilot certification.

Regarding flight instructor experience, building flight time while providing flight training to pilot candidates is an acceptable method for gaining flight experience to qualify for an ATP certificate.

QUESTION: Has the FAA received any data that suggests a correlation between implementation of the 2013 First Office Qualification (FOQ) rule and an increased failure rate in airline initial training, or other measures of a potential negative impact on pilot performance?

RESPONSE: The FAA does not have official data that suggests a correlation between the implementation of new requirements and a negative impact on pilot qualification or performance. However, the FAA is aware that some airlines have found that additional training events were required for many new-hire pilots to meet the qualification standards. As a result, some airlines have elected to revise their FAA-approved pilot training programs, increasing the training footprint for

new-hire pilots. The standards for demonstrating proficiency prior to flying in airline operations, however, were not changed.

QUESTION: Have other countries followed the United States' aviation certification requirements and required 1,500 of flight experience in order to serve as a first officer at a Part 121 air carrier?

RESPONSE: The FAA is not aware of any other civil aviation regulatory authority implementing a requirement for all pilots in air carrier operations to hold an ATP certificate, which requires 1,500 hours of flight time.

Questions for the Record
Representative Mark DeSaulnier

1. In 2011, the NTSB recommended that the FAA "[p]erform a technical review of Airport Surface Detection Equipment- Model X to determine if the capability exists system wide to detect improper operations such as landings on taxiways." The FAA responded that not only did it believe that using the ASDE-X system for this expanded purpose would result in performance compromises of other components of safety alert systems, but that it would not even conduct the recommended review.

a. Please explain the FAA's unwillingness to conduct the recommended review. If a review had provided evidence of FAA's claim that expanding the use of ASDE-X would compromise performance of other safety alert systems, would that not have been important data for the safety of our air system?

Answer:
The FAA was not unwilling to conduct the review; a technological limitation at the time precluded such a review. In 2011, the ASDE-X algorithms weren't capable of accurately identifying taxiway alignments. Recent modifications have made it possible to detect taxiway alignments with a false alert rate low enough to allow for implementation.

In January 2018, the taxiway lander alert was optimized and tested at Seattle, with promising results. The FAA is currently evaluating the implementation of this taxiway lander alert functionality at all 35 ASDE-X equipped airports.

b. In response to the July 7 Air Canada incident at SFO, the ASDE-X system in the SFO air traffic control tower was adjusted so that it would detect planes incorrectly lined up on approach to landing. What lessons has the FAA learned from this change and what is preventing the FAA from exploring the feasibility of making this adjustment at other airports?

Answer:
Using lessons learned from this incident, the FAA implemented several safety enhancements at SFO. These safety enhancements have been effective in identifying wrong surface alignment earlier, allowing corrections to be made before aircraft are in conflict with one another:

- The Airport Surface Surveillance Capability (ASSC) Arrival Corridor Box is now required to be displayed within the controller's ASSC settings. This box provides air traffic controllers with a reliable visual reference to aid in identifying wrong surface alignments.
- ASSC Parameters at SFO were extended from ½ mile to ¾ mile. This provides an alert of a potential collision with an arriving aircraft and a vehicle or aircraft on the runway approximately 8 seconds earlier.
- Precision approaches are required at night when a runway is closed.
- Air traffic controller shift coverage considers factors such as construction start times and traffic load.

- Outreach to the pilot and aviation community at SFO continues through activities such as Runway Safety Action Team meetings.

2. Five separate incidents involving commercial airplanes landing on taxiways or nearly landing on taxiways or incorrect runways occurred between July 2017 and January 2018. While the specific cause of each individual incident may vary, what, in your view, is the cause behind this high frequency of close-call incidents?

Answer:
The FAA categorizes events where an aircraft lands on or aligns to the wrong runway or taxiway, departs on the wrong runway or taxiway, or lands at the wrong airport as wrong surface operations. SFO has had four wrong surface events involving two or more air carrier aircraft since February 2017. The common contributing factors to the incidents at SFO are:

- Runway Changes
- Ineffective communication of runway change between pilot and controller
- Non-standard airport geometry and traffic increase leading to waiting for gates
- Pilot mis-identifying the correct landing surface
- Airport construction/lighting

3. In addition to the five close-call incidents over the last half-year, runway incursions increased by 83 percent from 2011 to 2017. What explanation do you have for the reasons for this increase?

Answer:
In 2012, the FAA implemented new reporting requirements and a robust system to collect runway safety reports and data. As a result, since 2012, there has been an increase in reports of all types, including runway safety events, compared to the period before the new reporting requirements were in place.

A key performance metric since the Runway Safety Call to Action is the A/B runway incursion rate. This metric was established to track the safety performance associated with the most severe surface incidents—Category A and B runway incursions. These incidents may require time critical corrective/evasive response to avoid a collision. The FAA and DOT set a safety performance target for FY 2009-2018 to maintain the rate of category A and B runway incursion at or below 0.395 per 1 million airport operations. The number of incidents has been below the performance target each year and in 2017 we had the fewest Category A and B runway incursions since the metric was implemented.

4. In a 2009 after-accident report about an American Airlines incident involving an in-flight engine fire, the then-Board Member and now-Chairman of the National Transportation Safety Board Sumwalt wrote about the "casual attitude of a flight crew" that he observed in his review of the cockpit voice recorder data. He also wrote,

> *What is the best way to prepare yourself to deal with events that are unfamiliar to you - events where there are no established procedures? Based on my flying experience and aviation safety background, I firmly*

believe the answer is rigorous adherence to standard operating procedures (SOPs) and cockpit discipline on each and every flight. When you do this, you are preparing yourself for the unexpected.

- What policies or programs are needed to ensure that airlines and pilots maintain strict, rigorous adherence to safety protocols and to prevent any sliding away from such adherence? Would regular review of actual inflight performance through the use of something like a CVR better enable you to assess adherence to these protocols?

Answer:

Airlines must continuously train and evaluate crewmember performance. This evaluation of crewmember performance is accomplished regularly in simulators and with en route inspections in the operational environment. FAA has oversight of the air carrier's training program and its line operation with en route inspections that include checks of protocol adherence. Airlines are additionally required, through their Safety Management Systems (SMS), to collect and analyze operational data in order to identify and mitigate risk, which would include lapses in pilot performance. The FAA regularly reviews the collection and analysis of this data, and the effectiveness of the airline's mitigation strategies.

CVR data is intended only for use by the NTSB for the investigation of accidents and serious incidents. It is not intended to be used for routine oversight to evaluate compliance with FAA regulations. In most cases, air carriers are precluded by their pilot labor contracts from using CVR data for anything other than NTSB investigations. Oversight of flight crewmembers' adherence to safety practices and protocols is achieved through other means, including training program reviews, en route cockpit inspections, and promulgation of professional expectations. Additionally, the FAA encourages and oversees industry programs to proactively address aviation safety in this context. For example, a Line Operations Safety Assessments (LOSA) program measures adherence of flight crews to Standard Operating Practices (SOPs) by trained observers and has produced valuable results for many air carriers.

- What processes does the FAA use for systematically reviewing and analyzing self-reported data for the specific purpose of understanding risks from human factors such as fatigue, distraction, or lax adherence to safety protocols? How does the FAA translate these findings on human factors into implementation of safety measures?

Answer:

Voluntarily submitted safety data is typically analyzed in two ways: internally via the air carrier's required Safety Management System (SMS) and within the Aviation Safety Information and Analysis Sharing (ASIAS) program. Both analyze and identify risks. If a risk is identified in the carrier's SMS, the carrier is then responsible for mitigating that risk with FAA oversight. If ASIAS identifies risk on a system-wide level (meaning not limited to one carrier) the risk is mitigated jointly with the FAA and industry through Commercial Aviation Safety Team (CAST) safety enhancements. The FAA supplements the analysis of operational data with research on human factors and pilot performance.

Implementation of identified safety measures can occur in a number of ways. The traditional approach is to initiate rulemaking if the project can demonstrate sufficient safety benefit. Alternatively, the FAA and Industry can jointly develop safety enhancements through one of our many partnerships, such as the CAST, Airman Certification Standards Working Group, the Air Carrier Training Aviation Rulemaking Committee (ACT ARC) or the Performance-Based Operations Aviation Rulemaking Committee (PARC).

5. The FAA officials who met with me last month in my Washington, D.C. office cited the Aviation Safety Information Analysis and Sharing (ASIAS) program as a successful program and one that has produced a substantial amount of useful data. However, a 2013 report from the Office of the Inspector General says that several years' worth of work is needed before ASIAS can be used as a tool to help predict and prevent aviation accidents.

- A few years have passed since the 2013 report. In your view, is the ASIAS closer to becoming a useful tool for the prediction and prevention of aviation accidents?

Answer:

The ASIAS program started in 2007, and participation in the program has continued to grow over the years. Starting with just a few carriers, the program has grown to 47 air carriers contributing data to ASIAS. ASIAS data has supported several safety studies leading to the voluntary adoption of 22 safety enhancements by the Commercial Aviation Safety Team (CAST). These safety enhancements have addressed emerging risk areas as well as enhanced deployed mitigations. The FAA believes that ASIAS has been integral to achieve the safest period in aviation history.

6. The 2013 OIG report also says that "the FAA does not allow its inspectors and analysts to use ASIAS's confidential data for their air carrier oversight." The report further states that "74 percent of field inspectors and analysts who responded [to the IG's survey] and were familiar with ASIAS stated that access to national level ... trends would improve air carrier safety oversight."

- Please explain the FAA's rationale for preventing FAA inspectors and analysts from using ASIAS data. Is ASIAS without FAA oversight adequately fulfilling FAA's mission for public oversight of the aviation industry?

Answer:

ASIAS leverages proprietary data that is voluntarily provided by air carriers to advance safety. The FAA does not have direct access to the proprietary data. The MITRE Corporation ensures that the data is processed in accordance with the governance protocols and supports the safety teams in conducting safety analyses. ASIAS is not intended to be leveraged for oversight activities. It is intended to integrate data provided by the aviation industry to identify trends that would require further action. The FAA has oversight systems that support ongoing surveillance of the aviation industry.

All safety studies conducted by ASIAS and the Commercial Aviation Safety Team (CAST), along with the safety enhancements, are shared with the FAA inspector workforce. Effective March 2018, each part 121 air carrier is required to have established a Safety Management System (SMS). The FAA expects all air carriers to conduct a risk assessment on all risks

identified by ASIAS/CAST and to take appropriate action under their SMS. Providing this information to the inspector workforce will enable operators and inspectors to discuss safety issues and ensure they are addressed under the air carrier's SMS. As ASIAS matures, it continues to explore better ways for communicating actionable information to the inspector workforce.

7. It is my understanding that airlines vary in the ways or the extents to which they require pilots to use instrument approach procedures as a back-up when they are cleared for a visual approach landing. Does the FAA keep track of the status of different airline practices in this regard? It is my understanding that on July 7, the Air Canada plane that came within 59 feet of landing on a taxiway had been conducting a visual approach and that the pilots may not have been using their instruments as a back-up. What procedures does the FAA have in place to ensure that pilots use instrument approach procedures as a back-up to visual approaches?

Answer:

There are no regulatory requirements for a carrier to have an instrument back up on a visual approach. However, the FAA promotes as a best practice incorporating a back-up instrument approach to a visual approach procedure. Air carriers are required to have a Safety Management System (SMS), which must review programs to determine risks and develop an appropriate response to mitigate them. A requirement to use an instrument approach as a backup to a visual approach is one mitigation that an air carrier's SMS could identify.

Procedures of this type are not managed centrally, but are documented locally at the certificate management office. FAA oversight of these procedures is conducted via regular review of the air carrier's training program.

8. On October 12, 2017, an Air Canada plane landed on a runway in spite of repeated instructions from air traffic control to execute a go-around. The NTSB is not conducting an investigation on this incident. What work has the FAA done or is currently doing to investigate this incident and what has it learned from this investigation? What are the safety recommendations that have emerged from the investigation, and what actions is the FAA taking to implement them?

Answer:

The FAA initiated, and has now completed, an investigation into this incident. Investigators and controllers from the FAA's Air Traffic Organization (ATO) and inspectors from the FAA's Flight Standards Service collected and reviewed recorded air traffic voice communications and data, interviewed the flight crew, prepared written reports, and held discussions with Transport Canada in accordance with ICAO Annex 13 international protocols for accident and incident investigation.

The investigation revealed that the crew inadvertently switched from SFO tower frequency to the standby frequency, SFO Ground. The premature frequency change was discovered after landing rollout when a switch back to SFO tower frequency occurred. Neither pilot had any history of

any safety events, violations, or pilot deficiencies. The event was deemed an isolated occurrence and not reflective of any systematic deficiencies at Air Canada.

The FAA Executive Director of the Flight Standards service discussed this event with the Director General of Transport Canada Civil Aviation (TCCA), and the discussions resulted in several actions. For example, Air Canada is reviewing radio SOPs in order to determine what improvements need to be implemented. In addition, TCCA has informed the FAA that it will continue to provide enhanced surveillance of Air Canada, conduct monitoring of additional training events, and implement additional in-flight surveillance checks into SFO.

In addition, United Airlines, as a code-share partner with Air Canada, is working with Air Canada to ensure that Air Canada's Safety Management System is capable of effectively managing safety risks.

This event, as well as all wrong surface events, are analyzed as a part of the Air Traffic Organization's Top 5 program. The resulting information is used to identify mitigations that will reduce the risk associated with wrong surface events. Mitigations span the aviation community and include technology solutions, training, procedures modifications, and community outreach.

Ali Bahrami, Associate Administrator for Aviation Safety, FAA, responses to questions for the record issued by Rep. Daniel Lipinski of Illinois

Repair station Drug & Alcohol, and Background check rulemaking (To FAA)

Two mandates included in the FAA Extension, Safety, and Security Act of 2016 are overdue. Both standards increase the safety requirements at foreign repair stations. First, the Act required the FAA to promulgate rule mandating alcohol and controlled substances testing for all foreign repair station employees responsible for safety sensitive maintenance functions on Part 121 air carrier aircraft. In March 2014, the FAA published an Advanced Notice of Proposed Rulemaking (ANPRM) on this subject, but has yet to take any actions since closing the comment period in July of that year.

The second instructs the FAA to institute a pre-employment background investigation of employees at foreign repair stations. Both standards are standard practice here in the United States. The FAA is long overdue in enacting these safety regulations. Why has the FAA not moved to enact these commonsense safety regulations?

FAA Response

We have developed a Notice of Proposed Rulemaking (NPRM) requiring FAA-certificated foreign repair station employees who are responsible for safety-sensitive maintenance functions on U.S. air carrier aircraft to be subject to an alcohol and controlled substances testing program, as determined acceptable by the Administrator and consistent with the applicable laws of the country in which the repair station is located. The NPRM is currently in the clearance process, and we expect it to continue to move forward.

Regarding pre-employment background investigations, the FAA and the Transportation Security Administration (TSA) jointly met with the Transportation and Infrastructure Subcommittee on Aviation in October 2017 to discuss the status of implementation of these provisions in Sec. 2112(c) of the FAA Extension, Safety, and Security Act of 2016 (Public Law 114-190). It was determined that the TSA regulatory requirements for pre-employment safety background checks satisfies the Congressional mandates.

Cabin Safety (To FAA)

A number of recent aviation incidents have called into question the ability of passengers to evacuate an airliner within the required 90 second window. The NTSB has concluded that passengers attempting to retrieve carry-on bags during emergency evacuations demonstrates that FAA actions to mitigate this behavior have been ineffective.

The NTSB has found that passengers exiting an aircraft with carry-on luggage was "the most frequently cited obstruction to evacuation," and just this year recommended that the FAA determine appropriate countermeasures to mitigate this hazard. Will the FAA act on this recommendation, and what action will the agency take?

FAA Response

We agree that this is an important issue. Our current certification standards for aircraft evacuation testing include the most adverse conditions, including aircraft aisles that are obstructed, to accurately simulate a real evacuation.

We maintain a high level of cooperation with the NTSB as we work to implement safety improvements, discuss controversial issues, resolve differences, and obtain agreement on the proper approach to address safety issues. The FAA also continues to respond to individual safety recommendations that result from NTSB investigations. We recently received the NTSB recommendations for the accident that resulted in this specific recommendation for the FAA to address passenger evacuations. We are in the process of developing a response, and will continue to work with the NTSB on how to best mitigate this potential safety hazard.

Unmanned Traffic Management (To FAA)

An unmanned traffic management system, or U.T.M., is critical to the continued growth, and ultimate success, of the commercial drone industry. Other nations and regions, such as the European Union, are aggressively moving ahead with UTM implementation plans to attract investment in this rapidly evolving technology. As required by the 2016 F.A.A. extension, F.A.A. recently inaugurated a U.T.M. pilot program.

How does the Unmanned Pilot Program align with other FAA UAS initiatives, including the remote identification and tracking rulemaking, the Low Altitude Authorization and Notification Capability, or LAANC program, and the D.O.T. U.A.S. Integration Pilot Program? How does the agency see these efforts complimenting one another to move toward safer integration of U.A.S.?

FAA Response

The Unmanned Pilot Program (UPP), a congressional directive for FAA and NASA to collaborate with industry, advances UAS industry by demonstrating the technologies and capabilities required to support UTM operations at an enterprise level.

The Integration Pilot Program (IPP), a Presidential directive for the Secretary of Transportation and the FAA to create a framework for state/local and tribal governments to partner with private sector entities to develop and test innovative UAS concepts, inform future guidelines and regulations, and to evaluate involvement of state/local and tribal governments in informing policy and regulations that permit more complex, demand-driven UAS operations. We will work with applicants to see how the activities in these programs can complement existing capabilities, such as that provided by LAANC.

Ultimately, the FAA, in coordination with NASA, will apply relevant information collected during the IPP and preliminary findings to inform the development of the UAS Traffic Management System under Sec. 2208 of the FAA Extension, Safety, and Security Act of 2016 (Public Law 114-190).

HOLD FOR RELEASE
UNTIL PRESENTED
BY WITNESS
February 27, 2018

Statement of
Akbar Sultan
Deputy Director
Airspace Operations and Safety Program
National Aeronautics and Space Administration

before the

Subcommittee on Aviation
Committee on Transportation and Infrastructure
U.S. House of Representatives

Chairman LoBiondo and Ranking Member Larsen, and Members of the Subcommittee, thank you for this opportunity to appear before you today to testify on NASA's aviation safety research.

NASA Role in Aviation Safety Research

NASA has made decades of contributions to aviation; every U.S. aircraft and U.S. air traffic control facility has NASA-developed technology on board. The continuous efforts to reduce risk in commercial aviation have made it the safest mode of transportation. Addressing known hazards and responding to issues illuminated by post-hoc analysis of incidents and accidents, commercial aviation has achieved exemplary safety records and inspired the confidence of the flying public.

Historical Examples

For decades, NASA research has contributed to this outstanding safety record. For example, in the 1980s NASA initiated research and development efforts associated with synthetic and enhanced vision systems (SVS/EVS). These cockpit systems present information to pilots about the external environment derived from static databases and onboard imaging sensors. The information, displayed on the pilot's heads up display, provides enhanced awareness of terrain and other obstacles. In the early 2000's, NASA supported initial testing of EVS on a Gulfstream aircraft which supported development of certification standards for SVS/EVS systems through participation on the RTCA committee that publishes standards.

The safety benefit of these systems has been recognized by the FAA. Aircraft equipped with SVS/EVS are permitted to land in low visibility conditions, conditions that would require a missed approach for non-equipped aircraft. In addition, the Commercial Aviation Safety Team identified additional potential safety benefits of SVS/EVS in their analysis of "loss of control" accidents. A large percentage of the accidents analyzed

occurred in low visibility conditions, and SVS/EVS systems can provide information necessary for maintaining proper situational awareness in the absence of out-the-window information. Today a large number of Gulfstream, Bombardier and Boeing business jets offer SVS/EVS capabilities and multiple manufacturers have developed systems for tablets that can be used on board general aviation aircraft.

Another good example, from the late 1970's was NASA research that led to the identification of cultural norms within the aviation community that resulted in increased vulnerability to crew communication errors. The typical command hierarchy discouraged co-pilots from questioning captains when they observed them making mistakes. While the concept is in many ways intuitive, several of the deadliest accidents of the era were found, through analysis of cockpit voice recordings, to have ineffective communication as a contributing factor. NASA developed training methods and techniques to support improved Crew Resource Management (CRM). CRM training teaches crews the effective use of all available resources for flight crew personnel to reduce errors, avoid stress, and increase efficiency through better understanding of human performance capabilities and methods for effective communication in the cockpit. United Airlines was the first airline to provide CRM training for its cockpit crews in the early 1980s. Since then CRM has become a global standard with training requirements mandated by the FAA, ICAO and EASA.

Current Aviation Safety Research Challenges

Now, as we look forward, aviation is on the verge of a significant transformation with the rapid evolution of new technologies, vehicles, and operations on the horizon, while retaining the high standards for safety to which we are accustomed. Maintaining a safe system will require recognition and timely mitigation of safety issues as they emerge, before they become hazards or lead to accidents. A shift toward proactive risk mitigation will become critical to meet these needs. In collaboration with the aviation community, NASA has developed a vision for safety assurance that is achieved by leveraging growing sources of aviation data, commercial data analytics methods, architectures, and the "internet of things" to enable monitoring, prediction, and prognostics capabilities. We are building on previous research to develop the underlying methods, tools and techniques necessary to effectively monitor ongoing operations, assess operations in real-time for emerging risks, and provide in-time strategies to mitigate those risks. Partnerships with operators and the FAA provide opportunities to validate our technologies, to tailor them to meet various needs, and a path for transition to the end users.

NASA has continued to develop methods to identify and predict potential safety incidents through analysis of operational data, which would otherwise go undetected. Through direct partnerships with airlines and the FAA, NASA researchers have been able to identify and detect additional safety relevant incidents using tools tuned to analyze large sets of flight data or radar track data. The knowledge gained from these tools has led airline partners to make adjustments to procedures to address these potential safety issues before they are realized.

Current NASA work in this area is focused on advancements that will allow users and airlines to identify anomalous behavior and precursors to known hazards in real-time. Progress in this area will allow users and airlines to verify information arriving through streaming operational data, assessment of data in real-time, and greater emphasis on advanced warning, including the ability to provide information about the likelihood of an emerging risk.
Human operator fatigue is a well-known risk to aviation safety but has proven difficult to monitor in operational settings. NASA's Fatigue Countermeasures research group has made progress in developing tools to monitor pilot or controller performance and is currently conducting studies to understand how duty times and schedules affect pilot performance. The goal is to deliver, in the near-term, tools and methods that human operators and their managers can use to predict degrading levels of fatigue and make necessary adjustments to schedules or procedures to lessen the risk or likelihood of a safety incident.

In addition to developing technologies to enable in-time monitoring and mitigation of safety hazards, NASA ARMD is addressing difficulties associated with assuring the safety of increasingly complex and autonomous aviation systems. We are supporting our traditional avionics partners and the FAA by developing and making available to the broad community improved methods, tools and guidance to support cost-effective paths for achieving the level of safety assurance required for the introduction of highly reliable advanced avionics and future Air Traffic Management (ATM) systems. Industry estimates of costs associated with Verification and Validation (V&V) activities reveal that these costs are becoming unsustainable and have begun to stifle innovation. Current NASA work builds on recent experiments with industry partners and includes development of additional tools and techniques that can reduce the costs and improve effectiveness of V&V, and therefore reduce overall development costs. NASA continues to provide tools and techniques to enable assurance early in the development process, when most errors are introduced, bringing down cost and improving safety coverage. Industry is working with us to evaluate the impact of these new tools and techniques with specific use cases. In addition, we are continuing to provide tools and the guidance to the FAA that can assist in modifying standards and existing certification processes.

NASA has served as a member of the Commercial Aviation Safety Team (CAST) since its formation in 1998. Co-chaired by industry and the FAA, the team is chartered with identifying safety risks and recommending voluntary safety enhancements. NASA researchers have contributed to the analysis and research associated with many of the safety concerns tackled by CAST. Most recently NASA has contributed to the CAST activities regarding causes of loss of airplane state awareness. We are currently completing research and development of cockpit systems with predictive algorithms to alert pilots, models for aircraft stall performance to improve fidelity of training environments, and specific flight crew training methods. All of these tools enable enhanced safety and will transition directly to the commercial aviation community through the CAST.

Under contract for the FAA, NASA has established the Aviation Safety Reporting System (ASRS) data. The ASRS is an important facet of the continuing effort by government, industry, and individuals to maintain and improve aviation safety. The ASRS collects voluntarily submitted aviation safety incident/situation reports from pilots, controllers, and others. Users can then act on the information these reports contain. Using the data, users can identify system deficiencies, and issue alert messages to persons in a position to correct them. Its database is a public repository which serves the FAA and NASA's needs and those of other organizations world-wide which are engaged in research and the promotion of safe flight.

NASA also is a member of Aviation Safety Information Analysis and Sharing (ASIAS) Executive Board. ASIAS leverages internal FAA datasets, airline proprietary safety data, publicly available data, manufacturers' data and other data. ASIAS fuses various aviation data sources in order to proactively identify safety trends and to assess the impact of changes in the aviation operating environment. NASA has and continues to develop data analytic algorithms for mining of the ASIAS data to proactively identify issues, and continuously transfers these technologies to the FAA and industry partners.

Emergent Users

Special attention is being directed toward assuring safety of emerging operations, such as small unmanned aircraft operating at low altitude in the near-term and autonomous passenger aircraft in the longer-term. Ongoing research is dedicated to understanding hazards unique to these domains and identifying data needs associated with monitoring such operations for potential risks. NASA is developing and testing models of new operational concepts to enable prediction of increased risk.

The cost of certification is the primary concern of our traditional and emergent industry partners, and the aviation industry faces significant technical challenges associated with certifying increasingly complex systems. Future aviation systems and high-density operations will rely on increasing autonomous capabilities. The methods to assure the safety of autonomous systems are in their infancy, and thus approaches will need to be investigated and evaluated for effectiveness. Given our past success in applying new safety assurance methods to autonomous systems for space missions, NASA is uniquely positioned to address this challenge. We have already performed initial demonstration of some valuable tools and other governmental agencies, like FAA and AFRL, are looking to NASA for leadership in this area. Specifically, NASA initiated the Unmanned Aircraft System in the National Airspace System (UAS in the NAS) project to enable routine access to larger class UAS into the regular controlled airspace. The UAS in the NAS project is focused on development of communications standards, detect and avoid technologies, human systems integration capabilities, and approaches to determining airworthiness requirements. In addition, NASA's UAS Traffic Management (UTM) research project may enable Beyond-Visual-Line-of-Sight (BVLOS) access by small UAS to the uncontrolled low altitude airspace below 400 feet. In collaboration with the FAA, the UTM project has established a cloud based federated architecture to enable safe operations of unmanned vehicles at low altitudes. The project has focused on

standardization of altitude reference schemes, understanding effects of wind on vehicles, multi-vehicle airspace operations, and position detection technologies.

Vehicle Research

NASA is building on a strong history of conducting research that advances state of the art in vehicle technologies in order to reduce the risk of flying in hazardous conditions. For example, NASA has addressed the issue of atmospheric icing hazards for decades, and has developed some of the key design tools to better understand how to reduce the impact of airframe icing. Now engine icing research builds on this long heritage of airframe icing. The phenomena that creates engine icing issues is not well-understood so NASA has conducted flight tests to better characterize the environment and has emulated these conditions in a ground test facility that is already proving to be very beneficial to industry. NASA successfully tested a highly instrumented engine in a broad range of engine ice crystal conditions and altitudes, enabling future NASA and external users to have greater confidence in the engine data collected under these simulated conditions as compared to natural atmospheric conditions in flight. This new capability will provide NASA with reliable datasets to develop engine ice accretion tools that assist in assessing new and existing engines. NASA will confirm its capability that can simulate the high ice water content cloud conditions experienced in nature to the degree required to simulate aviation safety issue of engine icing. In addition, NASA supported the development of new radar capability to detect high altitude ice crystal icing conditions to avoid engine icing conditions, which will help aircraft avoid these conditions in the future. NASA's data collection and analysis will also provide the FAA with the basis to establish and update standards as needed.

NASA and FAA Research Transition Teams

To enhance implementation and the capabilities of NextGen, NASA and the FAA have established Research Transition Teams or RTTs to develop joint research plans, fund our respective portions, and facilitate the handoff from NASA to FAA of the research results. The RTTs have been a best practice mechanism between NASA and FAA in ensuring effective coordination and transition of research to implementation. To ensure that research and development for aviation safety is jointly identified, conducted, and effectively transitioned to the implementing agency, NASA, along with FAA's NextGen Office (ANG), Air Traffic Organization (ATO), and Aviation Safety (AVS), have jointly established RTTs for System Wide Safety Assurance, UTM, and UAS in the NAS. Under each RTT, senior researchers and program managers of both agencies define needed research products and the transition path for implementation for both current and emergent users of the national air transportation system. Furthermore, through the RTTs, NASA works jointly with FAA's William J. Hughes Technical Center on joint simulations of the research products and on testing of a suite of assurance tools to help FAA assess aviation systems.

Concluding Remarks

NASA has a long and successful history of aviation safety research that has made a real difference in the remarkable safety record that our system enjoys. And we are constantly

looking for ways to continue to contribute – with a major emphasis on more prognostic approaches that will allow the aviation community to get out in front of issues before they become safety risks. Let me conclude by thanking you again for this opportunity to appear before you to discuss NASA's Aviation Safety research and to answer your questions.

Testimony of

Mr. John DeLisi
Director, Office of Aviation Safety
National Transportation Safety Board

Before the

Subcommittee on Aviation
Committee on Transportation and Infrastructure
United States House of Representatives

— On —

State of Aviation Safety

—

Washington, DC • February 27, 2018

NTSB | National Transportation Safety Board

An Independent Federal Agency

Good morning, Chairman LoBiondo, Ranking Member Larsen, and the Members of the Subcommittee. Thank you for inviting the National Transportation Safety Board (NTSB) to testify before you today.

The NTSB is an independent federal agency charged by Congress with investigating every civil aviation accident in the United States and significant accidents in other modes of transportation—highway, rail, marine, and pipeline. We determine the probable cause of the accidents we investigate and we issue safety recommendations aimed at preventing future accidents. In addition, we conduct special transportation safety studies and coordinate the resources of the federal government and other organizations to assist victims and their family members who have been impacted by major transportation disasters.

Our Office of Aviation Safety investigates all civil domestic air carrier, commuter, and air taxi accidents; in-flight collisions; general aviation accidents; and certain public-use aircraft accidents, amounting to approximately 1,500 investigations annually since 2007. We also participate in the investigation of major airline accidents in foreign countries that involve US carriers, US-manufactured or -designed equipment, or US-registered aircraft to fulfill US obligations under International Civil Aviation Organization (ICAO) agreements.

This testimony will address the state of aviation safety from the NTSB's perspective and is based on our investigations. It will include a description of safety issues we have identified and recommendations we have made, and will conclude with a description of the work we are doing with emerging transportation technologies in aviation.

Preliminary Aviation Accident Statistics, 2016

The US aviation system is experiencing a record level of safety, and preliminary aviation accident statistics for 2016 show an overall decline in the number of US-registered civil aviation accidents.[1] For the third straight year, there were no passenger fatalities as a result of accidents involving US air carriers operating under the provisions of Title 14 *Code of Federal Regulations* (*CFR*) Part 121.[2] Notably, since the crash of Colgan flight 3407 in 2009, there have been no passenger fatalities as a result of accidents involving US air carriers operating under Part 121 providing scheduled service.[3]

Overall, aviation deaths in the United States decreased slightly from 416 in 2015 to 412 in 2016. Nearly 94 percent of aviation fatalities (386 instances) occurred in general aviation accidents, with the remainder primarily in 14 *CFR* Part 135 operations, which includes charters, air taxis, air tours, and medical services (when a patient is on board). While the number of fatalities from general aviation accidents increased slightly from 378 in 2015, the fatal accident rate fell below 1 fatal accident per 100,000 flight hours for the first time in the NTSB's 50-year history.

[1] National Transportation Safety Board, 2016 preliminary aviation statistics.
[2] In 2013, there were two fatal accidents involving nonscheduled cargo flights operating under Part 121—National Air Cargo crash after takeoff at Bagram Air Base, Afghanistan, and United Parcel Service flight 1354 crash during approach in Birmingham, Alabama.
[3] National Transportation Safety Board, *Loss of Control on Approach, Colgan Air, Inc., Operating as Continental Connection Flight 3407, Bombardier DHC 8 400, N200WQ*, Rpt. No. AAR-10-01 (Washington, DC: NTSB, 2012).

Over the last several decades, significant advances in technology, important legislative and regulatory changes, and more comprehensive crew training have contributed to the current level of aviation safety. However, we continue to see accidents and incidents that remind us of the need to be ever vigilant in improving safety.

Most Wanted List Issue Area—Prevent Loss of Control in Flight in General Aviation

On November 14, 2016, we announced our Most Wanted List of Transportation Safety Improvements for 2017–2018.[4] This list identifies 10 focus areas for transportation safety improvements based on safety issues identified by our investigations. Many of the issues on the Most Wanted List address multimodal challenges for improving safety, including many that are identified in our aviation accident investigations, such as alcohol and drug impairment, distraction, occupant protection, fatigue, medical fitness, safe shipment of hazardous materials, and use of recorders. One issue area is specific to aviation: addressing loss of control (LOC) in flight in general aviation.

Since 2008, nearly 46 percent of fatal fixed-wing general aviation accidents in the United States resulted from pilots losing control of their aircraft in flight. As defined by the Federal Aviation Administration (FAA), an LOC accident involves an aircraft's unintended departure from controlled flight, which can be due to a variety of reasons, such as pilot distraction, loss of situational awareness, or weather. The most common type of LOC is an aerodynamic stall, including the possibility of poststall spin, which can occur when the pilot allows the aircraft to enter a flight regime outside its normal flight envelope. Unfortunately, the circumstances for these accidents are often repeated over time, and too many preventable crashes occur. We have focused on working with stakeholders, including the FAA, pilots, flight instructors, and other members of the general aviation community, to increase awareness, education, and training to address the risk of these events.

In 2013, we began holding a series of safety seminars focused on general aviation safety issues, including LOC, weather, impairment, experimental aircraft, and, most recently, ensuring adequate flight experience in different types of aircraft.[5] On April 24, 2018, we will hold a roundtable of industry and government experts to discuss inflight LOC and to highlight available technologies and training. We have also held events in locations such as Alaska and New York to share lessons learned about LOC from our accident investigations with the general aviation communities in those areas. We regularly issue Safety Alerts and videos for general aviation pilots and aviation maintenance technicians to increase awareness, education, and training on issues that we have seen in our accident investigations.[6] Our focus has been on continued collaboration with the FAA and the aviation community to develop and participate in initiatives to help reduce the number of fatal accidents. These efforts have played a major role in the progress made toward improving aviation safety.

[4] National Transportation Safety Board, *2017–2018 Most Wanted List* (Washington, DC: NTSB, 2016).
[5] National Transportation Safety Board, General Aviation Safety Seminars.
[6] National Transportation Safety Board, NTSB Safety Alerts.

Most Wanted List Issue Area—Expand Recorder Use to Enhance Safety

Expanding use of recorders is another Most Wanted List issue area that is important in all modes. In aviation, data, audio/voice, and video recorders capture and store critical information that can help investigators determine the cause of plane and helicopter accidents and companies and operators take proactive steps to prevent accidents. Yet, some aircraft, especially general aviation aircraft and rotorcraft, are still not equipped with these critical technologies, even though recorders are readily available, easily installed, and largely affordable.

Although we have used recorder data to determine the cause of accidents and to develop recommendations to help prevent future accidents, some questions can only be answered through the data provided by an image recorder. These devices help investigators and operators fill in the gaps when data and voice/audio recordings cannot capture all of the information. For example, although we obtained recorded cockpit audio and extensive parametric data during our investigation of the SpaceShipTwo accident, our investigators were only able to determine the true cause of the accident from video that showed the copilot prematurely moving the feather lock handle.[7]

We have recommended use of image recorders for more than 18 years. Although there may be technical solutions other than image recorders that can capture instrument readings displayed to the flight crew, those solutions do not also capture critical information about the cockpit environment conditions (for example, crew actions and visibility), instrument indications available to crewmembers, and aircraft system degradation. In 2013, we recommended that the FAA require installation of a crash-resistant flight recorder system, which should record cockpit audio and images and parametric data in certain newly manufactured aircraft as well as in certain existing aircraft.[8] Both recommendations are currently classified "Open—Acceptable Response."

Recorders not only help with determining the cause of a crash or accident, but, perhaps more importantly, they also help companies and operators establish effective safety management strategies. Data from recorders can be used to adjust procedures and enhance crew training to prevent accidents from happening in the first place. Although some operators have implemented—or are in the process of implementing—recorder programs and systems, many are slow to do so without regulatory requirements.

Recent Aviation Accident Investigations

I want to highlight several aviation accidents that we have investigated during the last 2 years that have raised additional safety issues.

---

[7] National Transportation Safety Board, *In-Flight Breakup During Test Flight Scaled Composites SpaceShipTwo, N339SS Near Koehn Dry Lake, California October 31, 2014*, Rpt. No. AAR-15/02 (Washington, DC: NTSB, 2015).

[8] Aircraft covered by the recommendations are turbine-powered, nonexperimental, nonrestricted-category aircraft that are not equipped with a flight data recorder and a cockpit voice recorder and are operating under 14 *Code of Federal Regulations* Parts 91, 121, or 135. Safety Recommendation A-13-12 applies to newly manufactured aircraft, and Safety Recommendation A-13-13 applies to existing aircraft.

Lockhart, Texas

On July 30, 2016, the deadliest US aviation accident since Colgan flight 3407 occurred in Lockhart, Texas.[9] A commercial hot air balloon pilot and his 15 passengers tragically died when their balloon struck power lines; crashed in a field near Lockhart, Texas; and caught fire. We determined that the pilot of the balloon made several poor decisions, both before and during the flight; for instance, he elected to fly in cloudy and foggy conditions that decreased his ability to see and avoid obstacles. However, in this accident, we also identified other decisions made by the government that raise safety concerns, such as a lack of medical oversight for commercial balloon pilots and a lack of targeted FAA oversight of potentially risky commercial balloon operations.

Currently, commercial balloon pilots are not required to hold a medical certificate of any kind. The Lockhart accident pilot had been diagnosed with medical conditions known to cause cognitive deficits that may affect decision-making and, ultimately, flight safety. In addition, medications were found in the pilot's system that are known to cause impairment and are listed on the FAA's "Do Not Issue" and "Do Not Fly" lists. Altogether, these issues would likely have led an aviation medical examiner to either defer or deny a medical certificate. As a result of this accident, we recommended that the FAA remove the medical certification exemption in 14 *CFR* 61.23(b) for pilots who are exercising their privileges as commercial balloon pilots and receiving compensation for transporting passengers.[10]

The FAA conducts almost all of its oversight of balloon operators at large balloon gatherings. Thus, those operators who do not attend the gatherings, such as the accident pilot, likely do not to receive any FAA oversight. This focus on balloon gatherings does not support the FAA's risk-based, data-informed approach to oversight. It also does not provide the FAA with opportunities to educate all commercial balloon operators and mitigate risk before an accident occurs. As a result of this accident, we recommended that the FAA analyze its current policies, procedures, and tools for overseeing commercial balloon operations and develop and implement more effective ways to target oversight of the operators and operations that pose the most significant safety risks to the public.[11]

The status of each of these recommendations is "Open—Await Response."

Frisco, Colorado

On July 3, 2015, an Airbus Helicopters AS350 B3e, registered to and operated by Air Methods Corporation, lifted off from the Summit Medical Center Heliport in Frisco, Colorado, and then crashed into a nearby parking lot and caught fire.[12] The pilot was fatally injured, and the two flight nurses were seriously injured. We determined that the probable cause of this accident was the helicopter's preflight hydraulic check procedure and lack of an alert to the pilot that

[9] National Transportation Safety Board, *Impact with Power Lines, Heart of Texas Hot Air Balloon Rides, Balóny Kubíček BB85Z, N2469L*, Rpt. No. AAR-17/03 (Washington, DC: NTSB, 2017).
[10] National Transportation Safety Board, Safety Recommendation A-17-34, October 31, 2017.
[11] National Transportation Safety Board, Safety Recommendation A-17-45, October 31, 2017.
[12] National Transportation Safety Board, *Loss of Control at Takeoff, Air Methods Corporation, Airbus Helicopters AS350 B3e, N390LG*, Rpt. No. AAR-17/01 (Washington, DC: NTSB, 2017).

hydraulic pressure was not restored, which resulted in an LOC after takeoff. We found that the impact forces of this accident were survivable for the helicopter occupants; however, the helicopter's fuel system, which was not crash resistant and facilitated a fuel-fed postcrash fire, contributed to the severity of the injuries.

The helicopter in this accident did not have—and was not required to be equipped with—a crash-resistant fuel system. The AS350-series helicopters received initial FAA type certificate design approval in 1977, and were not subject to the airworthiness standards revised by the FAA in October 1994 for "comprehensive crash resistant fuel system design and test criteria."[13] These design features were intended to reduce the risk of a postcrash fire and, for more severe crashes, minimize fuel spillage near ignition sources to improve the evacuation time needed for crew and passengers to escape a postcrash fire. The improved standards were not applicable to newly manufactured helicopters whose certification basis and approval predated the effective date of the revised airworthiness standards, which was November 2, 1994. According to Airbus Helicopters and Air Methods, no options existed for retrofitting an AS350 B3e helicopter with a crash-resistant fuel system until March 2016.

Shortly after the accident in Frisco, we issued a safety recommendation to the FAA as a result of a Bell Helicopter accident in Wichita Falls, Texas, in which the helicopter crashed and was destroyed by a postcrash fire.[14] The recommendation asked the FAA to require, for all newly manufactured rotorcraft regardless of the design's original certification date, that the fuel systems meet the crashworthiness requirements.[15]

In September 2017, the FAA responded to our recommendation by noting that its aviation rulemaking advisory committee (ARAC) created a subcommittee to examine the issue. The subcommittee analyzed the costs and benefits of such a regulation and determined that, although crash-resistant fuel systems were highly effective, the cost of such a mandate outweighed the benefits. The FAA asked the subcommittee to analyze whether partial compliance with the standards might show benefits with reduced compliance costs. In June 2017, at a public meeting of the ARAC, the subcommittee reported that it examined six models of in-service helicopters from three different manufacturers that met parts of the improved standards adopted in 1994. The analysis showed that none of the helicopter models had a postcrash fire in a survivable accident, while 11 percent of helicopters that met none of fire-resistant fuel systems standards had postcrash fires. The subcommittee is examining which parts of the fuel tank standards were in the six models of helicopters and will propose partial compliance standards that should have substantially reduced compliance costs while resulting in comparable safety benefits. The status of this recommendation is "Open—Acceptable Response."

Akron, Ohio

On November 10, 2015, Execuflight flight 1526, a Hawker 700A, departed controlled flight while on approach to Akron Fulton International Airport and impacted a four-unit apartment building in Akron, Ohio. The captain, first officer, and seven passengers died. Fortunately, no one

[13] 59 *Federal Register* 50380
[14] Accident CEN15FA003
[15] National Transportation Safety Board, Safety Recommendation A-15-12, July 23, 2015.

on the ground was injured. The airplane was destroyed by impact forces and postcrash fire.[16] We determined that the probable cause of this accident was the flight crew's mismanagement of the approach and multiple deviations from company standard operating procedures (SOPs), which placed the airplane in an unsafe situation. Contributing to the accident was Execuflight's casual attitude toward compliance with standards; its inadequate hiring, training, and operational oversight of the flight crew; and its lack of a formal safety program, and the FAA's insufficient oversight of the company's training program and flight operations. Among the safety issues identified was the lack of a requirement for flight data monitoring (FDM) programs for Part 135 operators.

In this accident, Execuflight had established SOPs, but the flight crew consistently failed to follow them. Execuflight had no means of monitoring its airplanes' daily operations, identifying operational deficiencies (such as noncompliance with SOPs), and correcting those deficiencies before an accident occurred. Absent continual surveillance of an operation through en-route inspections by company check airmen, the only means an operator can use to consistently and proactively monitor its line operations is through comprehensive data collection over the entirety of its operation, which can be accomplished through an FDM program. We believe that, as demonstrated by this and many other accidents, all Part 135 operators need FDM programs. Had an FDM program been in place at Execuflight, failure of either pilot to follow SOPs on earlier flights might have provided Execuflight the opportunity to take corrective action that could have avoided the accident.

As a result of this investigation, we recommended that the FAA require all Part 135 operators to install flight data recording devices capable of supporting an FDM program, and to require Part 135 operators to establish a structured FDM program that reviews all available data sources to identify deviations from established norms and procedures and other potential safety issues.[17] We understand that the FAA plans to review whether a cost–benefit analysis will justify such mandates. The status of these recommendations are "Open—Acceptable Response" and "Open—Acceptable Alternate Response," respectively.

Chicago, Illinois; Las Vegas, Nevada; Pensacola, Florida

On October 28, 2016, American Airlines flight 383, bound for Miami, Florida, experienced a right engine uncontained failure and subsequent fire during takeoff at Chicago O'Hare International Airport.[18] The flight crew aborted the takeoff and stopped the aircraft on the runway, and an emergency evacuation was conducted. Of the 161 passengers and 9 crewmembers onboard, one passenger received serious injuries during the evacuation. The airplane was substantially damaged by the fire, which was caused by a fuel leak that resulted in a pool fire under the right wing. A turbine disk in the right engine fractured into at least four pieces, with one piece going

[16] National Transportation Safety Board, *Crash During Nonprecision Instrument Approach to Landing, Execuflight Flight 1526, British Aerospace HS 125-700A, N237WR*, Rpt. No. AAR 16/02 (Washington, DC: NTSB 2016).
[17] National Transportation Safety Board, Safety Recommendations A-16-034 and A-16-035.
[18] National Transportation Safety Board, *Uncontained Engine Failure and Subsequent Fire, American Airlines Flight 383, Boeing 767-323, N345AN*, Rpt. No. AAR -18/01 (Washington, DC: NTSB 2018).

through the inboard section of the right wing, over the fuselage, and into a warehouse facility a third of a mile away.

We are currently investigating other accidents involving uncontained engine failures. On September 8, 2015, British Airways flight 2276 experienced an uncontained failure during takeoff at McCarran International Airport, Las Vegas, Nevada.[19] The plane sustained fire damage and the 157 passengers and 13 crewmembers evacuated via emergency slides on the runway. Five people sustained minor injuries and one person suffered a serious injury as a result of the evacuation. The airplane was substantially damaged. In addition, on August 27, 2016, Southwest Airlines flight 3472, en route from New Orleans, Louisiana, to Orlando, Florida, experienced an uncontained engine failure and cabin depressurization while climbing.[20] None of the 99 passengers and 5 crewmembers onboard were injured, but the airplane sustained substantial damage. The flight crew declared an emergency and diverted to Pensacola International Airport.

We held a Board meeting on January 30, 2018, to determine the probable cause of the Chicago accident and to issue relevant safety recommendations. The Board determined that the failure was caused by an internal defect in a turbine disk, which was likely undetectable when the disk was manufactured in 1997 and during subsequent inspections. The investigation also found numerous problems with the evacuation, including a lack of communication between the flight deck and cabin crew, deviation by a flight attendant from emergency evacuation procedures, and the crew's lack of coordination following the evacuation. The Board adopted nine new recommendations—seven to the FAA and one each to Boeing and to American Airlines—and reiterated two recommendations to the FAA.

One of the recommendations to the FAA addresses passengers evacuating airplanes with carry-on baggage, which has been a recurring concern. Flight attendants are trained to instruct passengers not to evacuate with carry-on baggage because doing so could potentially slow passenger egress and block an exit during an emergency. In June 2000, we released a safety study on emergency evacuations of commercial airplanes, which found that passengers exiting with carry-on baggage was "the most frequently cited obstruction to evacuation."[21]

Video taken during the Chicago evacuation and postaccident interviews with flight attendants indicated that some passengers evacuated from all three usable exits with carry-on baggage. In one case, a flight attendant tried to take a bag away from a passenger who did not follow the instruction to evacuate without baggage, but the flight attendant realized that the struggle over the bag was prolonging the evacuation and allowed the passenger to take the bag. In another case, a passenger came to the left overwing exit with a bag and evacuated with it despite being instructed to leave the bag behind. In addition, video from the British Airways event in Las Vegas and an October 29, 2015, Dynamic International Airways event in Fort Lauderdale

[19] National Transportation Safety Board, Uncontained Engine Failure, Las Vegas, NV.
[20] National Transportation Safety Board, SWA 737 uncontained engine failure and loss of inlet cowl, Pascagoula, FL.
[21] National Transportation Safety Board, *Emergency Evacuation of Commercial Airplanes*, Rpt. No. SS-00/01, (Washington, DC: NTSB 2000).

show passengers who evacuated with carry-on baggage despite the standard instruction to leave their baggage and similar items behind in the event of an emergency.

Evidence of passengers retrieving carry-on baggage during recent emergency evacuations demonstrates that previous actions to mitigate this potential safety hazard have not been effective. As a result of the Chicago investigation, we recommended that the FAA measure the potential delays associated with passengers retrieving and carrying baggage during an emergency evacuation, and determineappropriate countermeasures to mitigate any related potential safety risks.

Current Aviation Accident Investigations

I would also like to take this opportunity to highlight and provide an update on several aviation accidents that we are currently investigating.

San Francisco, California

Around midnight on July 7, 2017, Air Canada flight 759 was cleared to land on runway 28R at San Francisco International Airport (SFO), but instead lined up on a parallel taxiway where four air carrier airplanes were awaiting takeoff clearance.[22] Flight 759 descended below 100 feet above the ground, and the flight crew initiated a go-around about the time it overflew the first airplane on the taxiway.

We were notified of the incident on July 9, 2017, and initiated an investigation. Parties to the investigation include the FAA and the National Air Traffic Controllers Association. In accordance with ICAO Annex 13, the Transportation Safety Board of Canada has appointed an accredited representative as the state of registration/operator. The Canadian accredited representative has appointed Air Canada, Transport Canada, and the Air Canada Pilots Association as technical advisors.

The investigation team has reviewed Airport Surface Detection Equipment Model X/Airport Surface Surveillance Capability data associated with the incident, and has also interviewed controllers and management personnel at the SFO air traffic control tower and the Northern California Terminal Radar Approach Control, as well as personnel among the incident flight crew and other flight crews that were landing or on the taxiway at time of the incident. The incident airplane's cockpit voice recorder had been overwritten, so NTSB investigators did not have that data.

The preliminary information from our investigation indicates that runway 28L, next to runway 28R, was closed to accommodate construction and was appropriately lit, and notices to airmen had been issued to alert operators of the runway's operational status. The appropriate runway and approach lighting for runway 28R and for taxiway C were also operational. The captain had over 20,000 total flight hours, and the first officer had about 10,000 total flight hours. There were no known air traffic control equipment discrepancies. Normal air traffic staffing for

[22] National Transportation Safety Board, Landing Approach to Taxiway at San Francisco International Airport (SFO), San Francisco, CA.

the midnight shift included two controllers. On the evening of the incident, one controller was in the tower cab.

In addition to the Air Canada incident, there are two actual runway incursions at SFO involving runway 28L that we are currently investigating.[23] Runway incursions—or the incorrect presence of an aircraft, vehicle, or person on a runway—have increased since 2011.[24] On September 19 and 20, 2017, we held a 2-day forum to bring together safety experts from the aviation industry to raise awareness of the increase in runway incursions in the United States and the need to effectively reverse the trend.[25] The forum provided the opportunity for pilots, air traffic controllers, and others involved to discuss their perspectives on the runway incursion issue and what is needed to address it. We will be releasing some of the lessons learned from that forum in the near future.

Pullman, Washington

On December 29, 2017, a Horizon Air plane landed on a taxiway at Pullman-Moscow Regional Airport in Washington. Taxiway landings are reportable incidents under 49 *CFR* 830.5, and Horizon Air notified us of this incident after it occurred. At that time, investigators requested that the cockpit voice recorder and flight data recorder be preserved, and that pilot statements be obtained. Horizon Air is a Part 121 carrier and was transporting the public. We have investigated previous Part 121 taxiway landings because of the potential for a catastrophic outcome, and decided on January 26, 2018, to launch a formal investigation.

Brampton, Ontario

On June 3, 2016, a FedEx delivery truck was making its final delivery of four large, custom-designed, lithium-ion batteries to a Brampton, Ontario, address and was destroyed by a fire. The driver discovered that one of the large battery shipments contained a smoking package and, shortly after the discovery, the package burst into flames. The fire spread to the remaining packages in the cargo area and eventually destroyed the truck. The driver was not injured. The four batteries were designed and packaged by Braille Battery Inc., and transported from their Florida facility on two FedEx cargo flights. They were then loaded onto the FedEx truck for final delivery when the incident occurred, 10 hours after they were offloaded from the second aircraft.

Although this fire occurred in Canada, we are investigating this incident because the shipment involved a US air carrier and included lithium batteries that were presumably shipped in a configuration that would ensure safe shipment and containment of any battery failure. We believe our investigation findings may have significant implications on current regulations addressing the safe transportation of lithium batteries.

---

[23] Incidents OPS17IA008A and OPS17IA014A.

[24] Federal Aviation Administration, Runway Safety Trends and Runway Incursion Analysis, September 19–20, 2017.

[25] National Transportation Safety Board Forum, Runway Incursion Safety Issues, Prevention, and Mitigation, September 19–20, 2017.

International Aviation Accident Investigations

We fulfill the US obligations to foreign accident investigations established by treaty under the auspices of the ICAO. Although accidents involving US air carriers have been declining, we are participating in some significant international accident investigations. The key objectives of our international aviation accident investigations are to:

- Identify safety deficiencies affecting US aviation interests;
- Capture safety lessons learned to prevent accidents in the US; and
- Enable credible and comprehensive accident investigations where US interests are concerned.

Given the international nature of air transportation and the leading role the United States plays in developing aviation technologies, our participation in foreign investigations is essential to enhancing aviation safety worldwide.

Emerging Transportation Technologies

Advances in technology are transforming transportation and hold promise for improving transportation safety, but they also pose new challenges. Among those advancing technologies are commercial space transportation and unmanned aircraft systems (UASs).

Commercial Space

We have been involved in commercial space accident investigations for almost 25 years, since leading the investigation of a procedural anomaly associated with the launch of an Orbital Sciences Corporation Pegasus expendable launch vehicle in 1993.[26] Most recently, we led the investigation of the fatal in-flight breakup of SpaceShipTwo in October 2014.[27] Foremost among the safety issues identified was the need to consider and protect against human error for safe manned spaceflight, which is the responsibility of designers, operators, and overseers. We made recommendations to the FAA and the Commercial Spaceflight Federation to establish human factors guidance for commercial space operators and to strengthen the FAA's evaluation process for experimental permit applications by promoting stronger collaboration between FAA technical staff and commercial space vehicle operators.

Our work in commercial space transportation supports our broader mission of improving transportation safety through investigating accidents and serious incidents, collaborating outreach and education efforts related to commercial space vehicles, and developing and disseminating safety investigation techniques in commercial space with the international community. To develop and maintain the necessary investigative expertise and tools in this emerging segment of transportation, we are focused on training for NTSB staff and outreach with commercial space stakeholders.

---

[26] National Transportation Safety Board, *Commercial Space Launch Incident, Launch Procedure Anomaly, Orbital Sciences Corporation, Pegaus/SCD-1*, Rpt. No. SIR 93/02 (Washington, DC: NTSB 1993).

[27] National Transportation Safety Board. *In-Flight Breakup During Test Flight, Scaled Composites SpaceShipTwo, N339SS, Near Koehn Dry Lake, California, October 31, 2014*, Rpt. No. AAR 15/02 (Washington, DC: NTSB 2015).

Unmanned Aircraft Systems

The growing number of UASs and reports of near-collisions with manned aircraft have raised safety concerns regarding UAS integration into the airspace. In August 2010, we revised our Part 830 regulations to clarify that accident and incident notification requirements also apply to unmanned aircraft.[28] An advisory to operators was released in July 2016 clarifying the reporting requirements (i.e., if there is death or serious injury, the aircraft weighs more than 300 pounds and sustains substantial damage, or other specific serious incidents occur).[29]

On September 21, 2017, the pilot of a US Army UH-60 helicopter reported a collision with a small drone just east of Midland Beach, Staten Island, New York, representing the first confirmed accident involving a UAS and another aircraft. The helicopter sustained damage to its main rotor blade, window frame, and transmission deck. We determined that the probable cause of the incident was the failure of the UAS pilot to see and avoid the helicopter due to his intentional flight beyond visual line of sight. Contributing to the incident was the UAS pilot's incomplete knowledge of regulations and safe operating practices.[30] As the number and complexity of UAS operations continues to grow, it is inevitable that the number of NTSB UAS investigations will also increase.

We are also performing proof-of-concept testing using UASs as an accident investigation tool in all modes. UASs are rapidly becoming a standard tool in the domestic and international accident investigation community. Small UASs can be very rapidly deployed, which allows wreckage fields to be documented quickly and thoroughly when the accident area must be cleared expeditiously for safety or operational purposes. In addition, small UASs can access unique points of view useful to the investigator as well as areas otherwise inaccessible by conventional aircraft. Data collected is shared immediately, allowing investigators, managers, and support staff in distant locations instant access to accident site information not otherwise available.

Our ability to continue to provide outstanding investigative services and analyses requires the resources to acquire additional staff, develop staff expertise, and employ the appropriate equipment and analytical tools to investigate those transportation accidents where the latest technologies may have contributed to accident.

Conclusion

Thank you again for the opportunity to be here today to discuss the work that the NTSB is doing to make transportation safer. I will be happy to answer any questions.

---

[28] 49 CFR 830.2

[29] National Transportation Safety Board, *Advisory to Operators of Civil Unmanned Aircraft Systems in the United States*, July 29, 2016.

[30] National Transportation Safety Board, Inflight collision of UAS and helicopter, Staten Island, NY.

The State of Aviation Safety
Tuesday, February 27, 2018, 10:00 a.m.
2167 Rayburn House Office Building
Washington, D.C.

Questions for the Record (QFR)

Submitted on behalf of Congressman Sam Graves (M0-05)

1. Has the National Transportation Safety Board made any aviation safety or training recommendations based on a flight hours requirement?

   The NTSB has not made recommendations for flight hour minimums for air carrier pilots. Our recommendations have instead focused on specific procedures and training, needed regulations, and needed guidance to crews and operators.

2. From previous aviation accident investigations, has probable cause been found between the number of flight hours of the pilots and the cause of the accident?

   We have cited pilots' lack of total experience or experience in an aircraft type as causal or contributing to accidents, particularly in general aviation accidents. However, we have not produced analyses that would identify a minimum experience threshold when risk decreases to some 'acceptable' level. It intuitively makes sense that more experience is better, but it is very difficult to quantify. In fact, some of the analyses of experience we have done have shown examples of safety issues that do not decrease with increased experience. For example, the analysis of accident pilot experience for our recent fuel mismanagement safety alert found that student pilots rarely ran out of fuel, but 48 percent of the fuel mismanagement accidents involved pilots with a commercial or air transport pilot certificate and 50 percent of the accidents involved a private or sport pilot.

The State of Aviation Safety Tuesday,
February 27, 2018, 10:00 a.m. 2167
Rayburn House Office Building
Washington, D.C.
John DeLisi, Director, Office of Aviation Safety, National Transportation Safety Board
Responses to Questions for the Record (QFRs)

Congressman Mark DeSaulnier

1. Because our aviation system is so safe, accidents involving commercial aircraft are few and far between. With a limited number of accidents to investigate, what benefits come from investigating non-accident incidents for generating insights and recommendations for enhancing aviation safety?

   While the safety of commercial aviation is at an unprecedented level, safety risks identified through the conduct of comprehensive incident investigation can be mitigated before they lead to an accident. In 2017, the NTSB initiated investigations into 22 incidents involving issues such as drone safety, engine fires or failures, taxiway landing, enhanced ground proximity warning system alerts, and runway incursions. While these incident investigations may lead to NTSB safety recommendations, often it is the sharing of investigative findings with the air carrier industry that allow prompt mitigation of these hazards and prevent accidents.

2. Current regulations, 49 CFR 830.5, spell out the various kinds of incidents for which aircraft operators are required to provide immediate notification to the NTSB. Absent from this extensive list is the event of an aircraft nearly landing on the wrong runway, taxiway, or other part of the airport environment other than the assigned runway. By the existing regulations, the July 7, 2017 Air Canada incident at SFO in which a plane came within 59 feet of one of the worst aviation disasters in history did not meet the requirements for immediate notification to the NTSB. If regulations were to change to require these kinds of incidents to be reported, would this change allow NTSB to begin reviewing facts about the incident more quickly and develop a better understanding of incident trends?

   Even though there was no requirement for Air Canada to immediately notify the NTSB about the July 7 SFO incident, the NTSB learned about it from the FAA and launched a full investigation. Data from the incident was obtained from the airplane's flight data recorder and from SFO's ATC radar system. In addition, timely interviews were conducted with the Air Canada flight crew and the air

traffic controllers involved. The NTSB has an informal agreement in place to receive information from the FAA on operational incidents, pilot deviations, and surface events which works well without the need for a regulatory change.

3. In 2011, the NTSB recommended that the FAA "[p]erform a technical review of Airport Surface Detection Equipment-Model X to determine if the capability exists systemwide to detect improper operations such as landings on taxiways." What is your current sense of the progress that the FAA has made in exploring the feasibility of deploying this technology as a tool for preventing incorrect landings?

   The FAA initially replied in 2011 that it did not plan to take the recommended actions because it believed that the ability to accurately predict that an aircraft is arriving on a taxiway is not possible without significant degradation in performance, timeliness, and accuracy of safety logic alerts for what the FAA believed to be the more likely event of an aircraft arriving on a closed or occupied runway. As a result, on September 14, 2011, the NTSB classified the recommendation "Closed—Unacceptable Action." However, after the event in 2017 at SFO, an FAA spokesman indicated to the media that the FAA was working on modifications to ASDE-X so they could use the system to spot airplanes that are lined up to land on a taxiway, however, they did not submit an updated response to the NTSB recommendation. The NTSB was invited to observe a test of new features in the ASDE-X system, including the prediction of taxiway landings; the FAA can likely provide further information on their current plans to implement these recommended features.

4. In a 2009 after-accident report about an American Airlines incident involving an in-flight engine fire, the then-Board Member and now-Chairman Sumwalt wrote about the "casual attitude of a flight crew" that he observed in his review of the cockpit voice recorder data. His statement goes on to provide a nuanced analysis of what he heard on the CVR, including the way the pilots articulated their words when going through its flight deck checklists as well as the presence of non-pertinent remarks during key phases of the flight. Board Member Sumwalt then concludes that this casual approach to routine operations was a manifestation of a larger problem of a less-than-rigorous adherence to protocols that would likely exacerbate, if not cause, grave danger in a serious emergency situation. Board Member Sumwalt wrote,

   > *What is the best way to prepare yourself to deal with events that are unfamiliar to you -events where there are no established procedures? Based on my flying experience and aviation safety background, I firmly believe the answer is rigorous adherence to standard operating*

procedures (SOPs) and cockpit discipline on each and every flight. When you do this, you are preparing yourself for the unexpected.

- What policies or programs are needed to ensure that airlines and pilots maintain strict, rigorous adherence to safety protocols and to prevent any sliding away from such adherence?

  As a result of the Colgan accident in 2009, we issued recommendations and held a forum focusing on professionalism in airline flight crews. In 2016, the FAA published a Notice of Proposed Rulemaking in the Federal Register for the Pilot Professional Development rule that would also address some of these issues. In addition, the implementation of safety management systems that are now required for Part 121 carriers, and effective use of flight operations quality assurance programs can potentially help air carriers to address issues related to adherence to SOPs. The NTSB has also recommended that operators incorporate line operations safety audits (LOSA) into their oversight programs which have the potential to detect issues related to adherence to SOPs.

- Are the sorts of insights Board Member Sumwalt generated obtainable through existing programs for airline personnel to self-report safety incidents or irregularities?

  Yes, an operator's SMS, which includes voluntary reporting and monitoring programs such as Aviation Safety Action Program (ASAP), Flight Operational Quality Assurance (FOQA), LOSA, and internal audits, are designed to do just that: identify gaps in existing SOPs and compliance. For example, issues identified through an operator's ASAP program will result in corrective action for the involved crewmembers that could include ground school, simulator training, and/or line operational training and evaluation. Additionally, information gleaned from an operator's ASAP and FOQA programs is used by the safety and training departments to develop guidance on lessons learned for dissemination through company safety bulletins, briefings, and other literature.

U.S. DEPARTMENT OF TRANSPORTATION
OFFICE OF INSPECTOR GENERAL

Perspectives on Maintaining Safety and Enhancing Oversight of a Diverse and Complex Aviation Industry

Statement of Matthew E. Hampton
Assistant Inspector General for Aviation Audits, U.S. Department of Transportation

Before the Committee on Transportation and Infrastructure
Subcommittee on Aviation
United States House of Representatives

February 27, 2018
CC2018002

Chairman LoBiondo, Ranking Member Larsen, and Members of the Subcommittee:

Thank you for inviting me to testify today on aviation safety. As you know, safety is the Department of Transportation's top priority. Since 1958, the Federal Aviation Administration (FAA) has overseen the safe operation of the busiest and most complex aviation system in the world, which carries over 2.5 million people on approximately 45,000 flights every day. However, recent events, such as the near-miss of Air Canada flight 759 in San Francisco[1] last summer, have drawn renewed attention to the importance of enhancing aviation safety. As FAA continues to seek ways to ensure its safety efforts keep pace with a rapidly evolving aviation industry, new and longstanding oversight needs present several challenges.

My testimony today is based on our recent and ongoing work on aviation safety and will focus on two areas: (1) addressing evolving and longstanding safety oversight challenges related to regional carriers, aircraft parts, and runway incursions and (2) integrating unmanned aircraft systems (UAS) into the National Airspace System (NAS).

Summary

FAA is taking a number of important steps to improve its safety oversight of the NAS. However, our work continues to identify several challenges for FAA that have garnered significant public interest and congressional attention. In recent years, the regional air carrier industry, which serves more than 20 percent of all airline passengers, has experienced significant operational and financial changes that can impact safety in an industry that must keep costs low. These carriers must also meet the same safety standards as mainline carriers, and several oversight adjustments are required for FAA to proactively mitigate risks. Additionally, to ensure safe aviation operations overall, FAA needs to strengthen its monitoring and investigation processes to prevent faulty or counterfeit parts from being installed on aircraft and assess its efforts to reduce runway incursions—incidents on runways involving unauthorized aircraft, vehicles, or people. FAA has launched various safety initiatives over the years to mitigate these incidents, but the number of reported incursions continues to rise. Finally, the use of UAS represents a significant safety concern for FAA, which must accommodate the expansion of commercial UAS operations as it strengthens its oversight and risk-mitigation efforts. As the aviation industry continues to evolve

[1] "National Transportation Safety Board [NTSB] Issues Investigative Update on San Francisco Airport Near Miss," NTSB news release, August 2, 2017.

in these and other areas, FAA must be able to quickly adapt to any challenges to maintain the safety of the aviation system.

Addressing Evolving and Longstanding Safety Oversight Challenges

FAA continues to demonstrate a strong commitment to improving safety oversight of our aviation system. For example, FAA recently transitioned its oversight of passenger air carriers to its risk-based Safety Assurance System (SAS) to more effectively identify and mitigate safety risks. Yet FAA faces both new and longstanding safety oversight challenges involving various aspects of the aviation industry, and enhanced management and stakeholder communication will be key to addressing safety vulnerabilities. The Agency oversees a regional airline industry that serves more than 20 percent of all airline passengers and is rapidly evolving. To help ensure safe aviation operations overall, FAA must strengthen efforts to promptly identify and remove suspected unapproved aircraft parts from the aviation supply chain and address ongoing challenges to runway safety at airports.

Keeping Pace With a Dynamic and Evolving Regional Airline Industry

Regional air carriers have been a growing segment of the aviation industry over the last several years and now operate over 10,000 flights a day and serve approximately 20 percent of all airline passengers.[2] These carriers operate in a unique and competitive environment and present a multifaceted oversight challenge for FAA. While they must meet the same safety standards as mainline carriers, they operate under a business model that requires them to keep costs low. Yet they do not benefit from upward trends in ticket prices, additional revenue from baggage fees, or passenger enplanements. Therefore, their operations are strongly impacted by changes such as service expansion, airline consolidations,[3] or new pilot requirements—all of which have taken place in recent years.

[2] According to the Regional Airline Association, the average plane size flown by regional carriers grew from 24 seats in 1990 to 61 in 2015, and the average trip increased from 194 miles in 1990 to 478 miles in 2015.

[3] Regional airlines have purchased other airlines to expand operations. For example, SkyWest Inc. purchased ExpressJet in 2011. Airlines also merge their operating certificates to streamline operations. For example, in 2014, Republic Airways Holdings merged its Chautauqua Airlines certificate with Shuttle America's certificate.

At the request of the Ranking Members of this Committee and Subcommittee, we recently reported[4] on how FAA identifies periods of transition and growth for regional air carriers and adjusts oversight in response to operational changes. We found that FAA has not provided inspectors with sufficient tools and guidance to proactively identify and mitigate operational risks at regional carriers. FAA's main risk-assessment tool is subjective and does not include risk scoring—i.e., quantitative metrics to assess the severity of risks related to major operational changes brought about by transition or growth. These include turnover in key personnel, financial distress, or rapid service expansion. In addition, tools to help inspectors assess risks related to financial condition and rapid growth or downsizing are poorly designed and confusing, which limits their effectiveness.

As a result of these weaknesses, FAA may miss opportunities to accurately assess risks and take corrective actions. In one case, FAA inspectors did not recognize multiple indicators of financial distress, as defined in FAA guidance, before a carrier filed for bankruptcy. These indicators included a drastic decline in stock prices, a decrease in scheduled flights due to a pilot shortage, a lawsuit from one of its mainline partners for failing to complete contractually scheduled flights, and an increase in the pilot attrition rate. Although inspectors were aware of these indicators, they did not believe they posed an increased risk at the carrier and attributed many of the risk indicators to a pending merger between the company's subsidiaries.

Even when inspectors are able to identify risk areas, FAA guidance is vague regarding how inspectors should adjust surveillance. Inspectors often make adjustments based on their own discretion without the benefit of specific FAA guidance or data analysis to bolster their experiences. As a result, FAA may not be well positioned to respond to changes common to the regional carrier industry that carry safety implications, such as changes in airline partnerships and bankruptcies. FAA agreed with all 10 of our recommendations and is revising its risk assessment tools, improving data sharing between offices, and clarifying the guidance it provides to inspectors. The Agency committed to implementing our recommendations by the end of this calendar year.

A related issue for the Agency is the increase in required hours of flight experience to 1,500 hours for new pilot hires[5] and the effect on the pilot population, particularly at regional carriers. FAA issued this rule in 2013 in response to congressionally mandated changes regarding pilot training and experience requirements.[6] Regional carrier officials state that these requirements have reduced the pool of qualified pilots available to hire and affected the

[4] *FAA Oversight Is Not Keeping Pace With the Changes Occurring in the Regional Airline Industry* (OIG Report No. AV2018012), December 19, 2017. OIG reports are available on our website: https://www.oig.dot.gov/.
[5] This rule requires each commercial airline pilot to obtain an Airline Transport Pilot license, which requires 1,500 hours of flight experience (unless applicants have qualifying educational or military experience).
[6] Pub. L. No. 111-216 (2013).

experience levels of new hires. However, FAA has not analyzed the impact of the 1,500-hour rule on the pilot population or reviewed industry's concerns regarding a pilot shortage. Furthermore, the Agency currently has no plans for such a study, even though pilot training, experience, and staffing levels can all play a role in maintaining safety. This raises questions about whether FAA is prepared to detect changes in the pilot pool that may introduce risk into regional air carriers' operations. This will be an important watch area for the Agency in the near and long term.

Strengthening the Investigative Process and Proactively Removing Suspected Unapproved Parts From the Aviation Supply Chain

The traveling public depends on FAA and the aviation industry to ensure that U.S. aircraft are properly maintained and airworthy. Part of this responsibility is to detect and monitor for Suspected Unapproved Parts (SUP)—aircraft parts that may have been manufactured without FAA approval, including counterfeit parts. Our office has been tracking SUPs for years, and we recently reported that FAA's process for monitoring and investigating SUPs is not as effective as it could be.[7] This is largely due to weaknesses in recordkeeping and management controls to capture and accurately report the number of SUP cases. For example, our recent analysis of all 265 SUP entries in FAA's database revealed 16 duplicate, 86 incomplete, and 28 invalid entries. While FAA guidance provides broad direction to its analysts on data gathering for Hotline submissions, it does not have specific guidance on data entry for SUPs reports. As a result, the quality of data available to FAA to analyze trends is compromised, and FAA does not have a full picture of the problems and risks involving unapproved parts within the aviation industry.

FAA also does not ensure all SUPs are reported to its Hotline office, which should be the central point of contact, where analysts can receive and track SUPs reports in order to identify trends. However, SUPs can be reported through a variety of channels, including reports made by the public to the Hotline or local inspection offices. FAA guidance states that field inspectors who receive SUPs reports from complainants should provide them to the Hotline for tracking and resolution. However, FAA inspectors do not follow the guidance, and some reports to local inspection offices never make it to the Hotline. As a result, the Agency cannot be

[7] *Enhancements Are Needed to FAA's Oversight of the Suspected Unapproved Parts Program* (OIG Report No. AV2017049), May 30, 2017.

assured that all SUPs reports to local inspection offices have been captured in the Hotline's database.

Furthermore, once unapproved parts are identified, FAA's oversight of industry actions to remove them from the supply chain is ineffective. This is because FAA does not confirm that operators (e.g., manufacturers, repair stations, and parts distributors) take appropriate action to remove unapproved parts from their inventories. For example, an FAA inspector determined that tens of thousands of privately owned commercial aircraft parts, which were for sale online via eBay, were unapproved. However, the inspector did not physically account for the location and quantities of the parts but instead accepted a letter from the owner stating that he had removed the ad from his eBay site and had not sold any parts. As of February 13, 2018—more than 4 years later—the ad for these parts and the owner's contact information could still be viewed online.

FAA agreed with all 11 of our recommendations and is committed to taking action to strengthen its management controls and ensure consistent SUPs investigations. While we are encouraged by FAA's response to our recommendations, ensuring that the hundreds of thousands of aircraft parts installed on airplanes are manufactured or repaired according to standards will continue to be a significant challenge for FAA and the aviation industry.

Addressing Reports of Increased Runway Safety Incidents

Several recent incidents involving close calls in the air and on the ground at our Nation's major airports are a cause for concern. For example, in February 2017 at the San Francisco International Airport, a controller mistakenly cleared one aircraft to land on a runway while another was waiting to depart. A surface surveillance system alerted the controller about the potential collision, and the controller instructed the arriving aircraft to abort its landing.[8] In addition, in November 2017, a commercial aircraft lined up to land on an active taxiway at Atlanta Hartfield International Airport before aborting the landing.

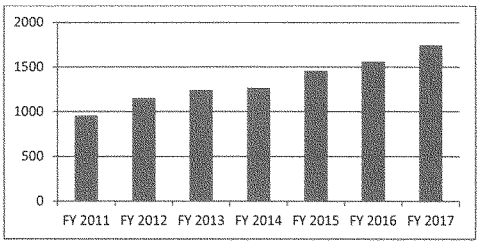
Much of our work in this area has focused on FAA's efforts to reduce runway incursions—incidents involving unauthorized aircraft, vehicles, or people on a runway—which has been a longstanding challenge for FAA. We have repeatedly reported on FAA's efforts to address this issue and made recommendations to improve the Agency's ability to implement, prioritize, and measure the

[8] As noted previously, there was another near-miss incident at the San Francisco International Airport in July 2017. Instead of landing on a runway, a commercial airplane pilot attempted to land on a taxiway where four other aircraft were awaiting takeoff. This incident has not been officially classified and is currently under investigation by the National Transportation Safety Board.

effectiveness of its runway safety initiatives.[9] The Agency has undertaken a number of safety initiatives since 2007 in response to our recommendations. These initiatives include instituting voluntary reporting mechanisms for controllers; installing new technologies, such as Airport Surface Detection Equipment, Model X (or ASDE-X), that warn controllers and pilots about runway hazards; and conducting outreach efforts at individual airports and Government-industry forums.

However, reports of incursions have increased over the last several years, with a nearly 83-percent rise in total incursions between fiscal years 2011 and 2017 (see figure 1).

Figure 1. Total Number of Runway Incursions, Fiscal Years 2011–2017



Source: OIG analysis

While the number of serious incidents is relatively low, they fluctuated over the same timeframe, ranging from a low of 7 in fiscal year 2011 to a high of 19 in fiscal year 2016. To help mitigate runway incursions, FAA initiated a Call to Action forum in 2015 that focused on developing short-, medium-, and long-term initiatives. We are currently evaluating the Agency's progress in this effort. Our preliminary results indicate that FAA has had success in educating pilots about visual aids at high-risk airports and in conducting outreach to the aviation community. However, the Agency faces challenges in implementing other initiatives, including those associated with new technologies, such as Data

[9] *FAA's Call to Action Plan for Runway Safety* (OIG Report No. AV-2010-071), July 21, 2010; *FAA Operational and Programmatic Deficiencies Impede Integration of Runway Safety Technologies* (OIG Report No. AV-2014-060), June 26, 2014; *Management Limitations May Hinder FAA's Ability To Fully Implement and Assess the Effectiveness of Its Runway Safety Initiatives* (OIG Report No. AV-2014-130), September 25, 2014.

Communications (DataComm),[10] and measuring their effectiveness at mitigating runway incursions. We anticipate issuing our report later this year.

Integrating Unmanned Aircraft Systems Into the National Airspace System

The growing use of UAS for commercial purposes—ranging from filmmaking to package delivery—represents a substantial economic opportunity for the United States. However, it also presents one of the most significant safety challenges FAA has faced in decades. In addition to managing the regulatory challenges of this evolving industry, FAA must also develop strategies for overseeing an increasing number of operations and mitigating safety risks.

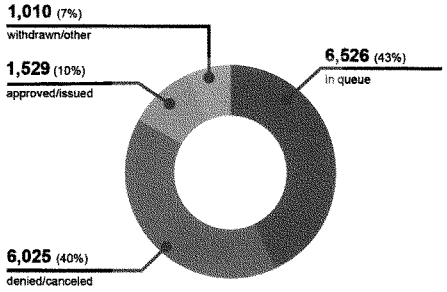
Meeting the Regulatory Challenges of an Evolving and Diverse Commercial UAS Industry

FAA recently forecast that the number of UAS in the United States is likely to be about 4 million by 2021, increasing from 1.1 million in 2016. The growing demand for commercial UAS presents new regulatory challenges for FAA, which must develop rules to govern UAS usage while maintaining safety. To advance the safe integration of UAS in domestic airspace, FAA published a new rule in June 2016[11] for small UAS (i.e., systems weighing less than 55 pounds). However, the rule does not permit several potential uses for UAS that are highly valued by industry, such as operating beyond line of sight or at night. To accommodate these operations, the rule allows operators to apply for waivers from its provisions. As shown in figure 2, as of January 2018, the Agency has received more than 15,000 waiver applications and reviewed more than 7,500, issuing approvals for nearly 1,530 waivers. However, just over 6,500 applications are still pending, and the Agency's backlog continues to grow.

[10] DataComm is expected to provide 2-way digital communications between controllers and flight crews by reducing radio voice communications, improving accuracy, safety, and reducing time. While DataComm is being used at over 50 airport towers, the Agency does not expect controllers to use the technology to issue taxi instructions until 2026 at the earliest.

[11] 14 CFR Part 107 (June 2016).

Figure 2. Number of Waiver Applications Processed by FAA Since August 2016



Source: OIG analysis of FAA data

While most of these approved waivers (more than 90 percent) have been for night flying, others have been granted for more complex activities, such as for flying over people or beyond line of sight. The commercial activities that typically receive waivers for UAS operations are filmmaking, photography, real estate, and construction.

Developing Strategies for Overseeing Operations and Mitigating Risks as UAS Integration Continues

The increasing number of UAS operators presents significant oversight and risk-mitigation challenges for FAA. The Agency is in the early stages of developing a risk-based oversight process for commercial UAS operators. For example, FAA recently published national program guidelines that instruct Flight Standards field offices to plan at least one operator inspection per year. However, this guidance does not include risk or operational factors field offices should consider when they decide which UAS operators to visit, and it did not take effect until the beginning of fiscal year 2018.

Developing an effective oversight strategy is particularly important given the safety issues that arise as UAS increasingly operate in the same airspace as manned aircraft. UAS sightings by pilots and other sources have increased

dramatically. Over 2,100 events were reported in 2017 and more than 1,800 in 2016, compared to about 1,100 in 2015 and just 238 in 2014, according to FAA's UAS event data. However, FAA still lacks a cohesive system for tracking and analyzing UAS sightings and incidents, which is an essential element of a risk-based oversight system. This limits the Agency's ability to identify, analyze, and mitigate safety risks.

A recently released report from FAA's Center of Excellence for UAS Research on the potential impact of UAS collisions further highlights the importance of mitigating these risks.[12] Specifically, the research shows that small UAS can cause greater structural damage to manned aircraft, including wings and engine fan blades, than bird strikes. The Center plans to conduct additional research on engine ingestion of UAS in collaboration with engine manufacturers, as well as additional studies on airborne collisions with helicopters and general aviation aircraft. These research projects began last year and will run through fiscal year 2021.

Another UAS oversight challenge for FAA is to identify and locate UAS operators, if the Agency needs to contact them or take enforcement action after an incident or violation. FAA established an aviation rulemaking committee, which recently gave the Agency recommendations and options for remotely identifying and tracking UAS owners and operators, as directed by Congress in the FAA Extension, Safety, and Security Act of 2016.[13] Based on the act's requirements, FAA is also in the process of developing a pilot program to manage UAS in low-altitude airspace (i.e., at or below 400 feet). These efforts could help FAA respond to the challenge of identifying and managing small UAS operations in the NAS.

Finally, prosecuting UAS owners who violate FAA regulations or engage in illegal flight activities has been challenging. Since 2016, our Office of Investigations has opened 23 cases involving illegal operation of UAS. However, 10 of these cases were closed in the preliminary complaint phase, and 9 were declined for prosecution for various reasons, such as the inability to prove criminal intent and a lack of prior prosecutions. Ultimately, further attention is needed to ensure FAA has strong oversight and enforcement mechanisms in place so it can effectively identify violations and mitigate the safety risks associated with increased UAS operations.

---

[12] *The sUAS Air-to-Air Collision Severity Evaluation Final Report*, Alliance for System Safety of UAS through Research Excellence (ASSURE), November 2017.
[13] Pub. L. No. 114-190 (2016).

Conclusion

FAA has taken important steps to meet its primary mission of ensuring aviation safety and is committed to carrying out a number of our recent recommendations to enhance its safety oversight. However, as the aviation industry continues to evolve, FAA must ensure it can quickly adapt to new oversight challenges, while also addressing longstanding safety concerns. Increased management attention and a strong commitment to risk-based oversight will be vital to ensure FAA continues to maintain one of the safest aviation systems in the world. We remain committed to supporting FAA's efforts through our audits and investigations to ensure the safety of the NAS, and we will continue to update you on our work on these and related matters.

This concludes my prepared statement. I would be happy to address any questions from you or Members of the Subcommittee at this time.

U.S. DOT OIG
Fraud & Safety
Hotline

hotline@oig.dot.gov | (800) 424-9071

https://www.oig.dot.gov/hotline

Our Mission

OIG conducts audits and investigations on behalf of the American public to improve the performance and integrity of DOT's programs to ensure a safe, efficient, and effective national transportation system.

OFFICE OF INSPECTOR GENERAL
U.S. Department of Transportation
1200 New Jersey Ave SE
Washington, DC 20590

www.oig.dot.gov

Matthew E. Hampton, Assistant Inspector General for Aviation Audits, Office of Inspector General, U.S. Department of Transportation
Responses to Questions for the Record
The State of Aviation Safety
February 27, 2018

Questions issued by Congressman Mark DeSaulnier of California

QUESTION:

The FAA officials who met with me recently cited the ASIAS program as a successful program and one that has produced a substantial amount of useful data. However, a 2013 report from the OIG says that several years' worth of work is needed before ASIAS can be used as a tool to help predict and prevent aviation accidents. In your view, is the ASIAS closer to becoming a useful tool for the prediction and prevention of aviation accidents?

ANSWER:

Yes. ASIAS is a useful tool to help identify risks that can lead to aviation accidents and serious incidents, but complex development work remains before it can help FAA and the aviation industry predict accidents. FAA's efforts to improve ASIAS continue, and—as the Agency has planned—they will take years to implement. For example, FAA is still working to improve the program's capabilities to combine data voluntarily reported by pilots and air traffic controllers with other information, such as mandatory incident reports from the Agency's air traffic facilities. In addition, FAA plans to enhance the identification of safety risks by discovering and examining aviation system vulnerabilities. FAA's most recent plan for ASIAS outlines improvements and milestones through 2023, and indicates that the transition to prognostic safety analyses will be implemented over the next decade.

DeSaulnier QFR #2: ASIAS

QUESTION:

The OIG report also says that "the FAA does not allow its inspectors and analysts to use ASIAS's confidential data for their air carrier oversight." The report further states that, "74 percent of field inspectors and analysts who responded to the OIG's survey and were familiar with ASIAS stated that access to national level...trends would improve air carrier oversight." Do you believe that our aviation safety system is relying on self-reporting and self-monitoring at the expense of oversight of the airlines? What, in your view, is an appropriate way to strike a balance between voluntary action and government oversight?

ANSWER:

We have not found that our aviation system overly relies on self-reporting and self-monitoring at the expense of airline oversight. As we and others have reported, ASIAS can provide insights into actual flight operations along with possible safety risks and accident precursors that would otherwise not be available to FAA. Using these data, FAA and airlines can improve safety by enhancing the effectiveness of airline training programs, flight procedures, maintenance processes, and air traffic control operations. However, it is important for FAA to strike a balance between voluntary action and oversight—there is no substitute for effective Government oversight of airline operations.

In our view, there are two ways to achieve this balance. First, FAA needs to share ASIAS data and resulting safety enhancements with field staff to incorporate into day-to-day oversight activities. For example, FAA inspectors could identify a higher risk for air carriers that do not implement recommended safety enhancements. In response to our recommendations, FAA is implementing a process to provide ASIAS safety enhancement data and new oversight tools to aviation safety inspectors in the field.

Second, as we have recommended, reports to voluntary programs should not include information related to accidents. We believe these data are not appropriate for the program because voluntary reports would not include the possibility of disciplinary actions against employees that may have caused the accidents.

WRITTEN STATEMENT OF

AIR LINE PILOTS ASSOCIATION, INTERNATIONAL (ALPA)

BEFORE THE

SUBCOMMITTEE ON AVIATION

OF THE

COMMITTEE ON TRANSPORTATION AND INFRASTRUCTURE

U.S. HOUSE OF REPRESENTATIVES

FEBRUARY 27, 2018

"STATE OF AVIATION SAFETY"

Air Line Pilots Association, International
1625 Massachusetts Avenue, NW
Washington, DC 20036
(202) 797-4033

The Air Line Pilots Association, International (ALPA), represents more than 60,000 professional airline pilots flying for 34 airlines in the United States and Canada. ALPA is the world's largest pilot union and the world's largest non-governmental aviation safety organization. We are the recognized voice of the airline piloting profession in North America, with a history of safety and security advocacy spanning more than 85 years. As the sole U.S. member of the International Federation of Airline Pilots Associations (IFALPA), ALPA has the unique ability to provide active airline pilot expertise to aviation safety issues worldwide, and to incorporate an international dimension to safety advocacy.

Overview

While 2017 was the safest on record globally, U.S. airlines operated under Part 121 have not experienced a single passenger fatality resulting from an accident since 2009; over 9 years. This is due to the efforts of aviation industry and our government partners BUT also due to the efforts of Congress. Prior to the passage of the Aviation Safety and FAA Reauthorization Act of 2010 the passenger airline industry lost approximately 1100 passengers in aircraft accidents. Since the passage of that bill there has not been a single passenger fatality.

When compared to the rest of the world, the United States passenger airline record is truly remarkable. In the same 9-year timeframe that there have been no fatal United States passenger airline accidents, there have been 81 fatal passenger accidents

around the world, which includes more than 4,100 fatalities. The most important work this committee can accomplish is to ensure the United States maintains the highest safety levels in the world and continue to lead by example. This allows passengers to board a passenger airline, or send their mail, cargo, and gifts via an all-cargo airline, and know, without a doubt in their mind, that all will get there safely. From day one in 1931, ALPA has maintained our motto of "schedule with safety". It hasn't changed; safety is still our top priority.

Thus, the hearing today is very important to ALPA. I thank you for putting the spotlight on safety because we need to keep the focus on safety constantly, and the committee is to be recognized for its efforts to do so.

We were pleased the committee chose to hold this hearing in February. As you know, the most recent passenger airline accident occurred on a cold snowy February evening in 2009, in Clearance Center, New York when Colgan Airlines Flight 3407 crashed on approach to landing. Fifty people lost their lives. Earlier this month the pilots of ALPA, and many others directly impacted by that tragic accident remembered those we lost, and recalled the horror that for some, will always be etched in our hearts and in our minds.

While we still mourn the loss of family, friends and fellow co-workers we also are able to appreciate the tremendous advancements in safety that has resulted from the focus members of Congress, the Federal Aviation Administration (FAA), and industry

collectively put into ensuring an accident like Colgan flight 3407 would be less likely happen in the future. And, given the laws and rule changes that have taken place, it appears that Congress, the FAA and industry got it right!

However, in order for the United States aviation industry to continue to be the safest and most efficient airspace system in the world, this committee has very important work to do that needs to be accomplished, without delay. Unless we keep airline safety the top priority we risk digression and an increase in accidents that impact our ability to make progress on other important aspects of aviation such as airspace capacity and operational efficiencies.

First Officer Qualifications Have Improved Aviation Safety

The best and most important safety feature of any airline operation is a well-trained, fully qualified, highly experienced, and adequately rested professional flight crew. With a solid foundation of training and experience, pilots are essential in maintaining the safety of our system and ensuring that aviation safety continues to advance. Several regional airline accidents from 2004 to 2009 identified numerous training and qualification deficiencies that ultimately led to congressional action and regulatory changes that significantly improved airline safety. The last of these accidents occurred February 12, 2009, near Buffalo, N.Y. Fifty lives were lost—49 in the aircraft and one on the ground. This accident is now viewed as a "watershed event" for the airline industry and aviation safety by resulting in improvements in

pilot training, qualification, and flight experience requirements as well as implementation of science based flight, duty, and rest requirements.

The following year, Congress acted decisively and forcefully on the identified safety deficiencies by sending legislation to the president that addressed the documented shortcomings. P.L. 111-216, the "Airline Safety and Federal Aviation Administration Extension Act of 2010," was signed into law on August 1, 2010.

Following the establishment of the law, and based on industry recommendations, the FAA, citing 31 accidents over a nine-year period, issued regulations effective August 1, 2013 to establish minimum first officer training and qualification requirements.

These regulations require that all airline pilots flying under 14 Code of Federal Regulations (CFR) Part 121 must hold the air transport pilot (ATP) certificate. They also created the restricted ATP (R-ATP) certificate pathway, which could be obtained with fewer flight hours than the ATP, if the pilot applicant receives academic and flight training from the military or an accredited aviation college or university.

The new rules emphasize significantly greater focus on academics and instruction, areas of knowledge, and flight experience in various weather and operational situations. The rules also require a type rating in the aircraft to be flown for the airline if operated in FAR Part 121 service, among other numerous safety improvements such as increased experience in multi-engine aircraft. The FAA made a specific

mention of the importance of academic training when it published the final rule, and how the accredited academics along with ground and flight training was necessary to qualify for a reduction in hours.

As mentioned, the law also resulted in science-based flight, duty, and rest requirements for airlines. Unfortunately, these new flight and duty requirements were only applied to passenger airline operations. Cargo airline operations were carved out.

Based on the safety improvements with minimum pilot training and qualification requirements achieved since P.L. 111-216 became law, we strongly urge the committee to preserve these critically important safety regulations. *We urge the committee to reject any proposal to modify or change that weakens the current minimum first officer qualifications. These rules are working very well in all aspects, and lives have been saved.*

Safety regulations should not be driven by the economic decisions of airlines.

There are some people and organizations who want to fix business-related industry problems by weakening the First Officer Qualification (FOQ) rules. These organizations believe safety is something that can be negotiated. They believe that rolling back provisions in P.L. 111-216 is the best way to fix their business challenges by widening the employment pool. By that same logic, would these same groups be

lobbying to shorten the duration of medical school in an attempt to attract more doctors to work in rural areas?

It is somewhat ironic that some who called for the changes in P.L. 111-216 have since become critical of the new rules, arguing that the new First Officer Qualifications have created a pilot shortage. Small communities which have experienced changes to the levels of airline services are also citing a pilot shortage. However, in both cases, there is no reliable data to support these positions.

There are several business-related reasons that proponents cite for relaxing the safety rules. They say that the rules have negatively affected the industry in a number of ways.

For example, while some have pointed out that the rules have created a pilot shortage, the data says differently. There is an adequate supply of qualified pilots and a robust pipeline of pilots to meet the needs of commercial aviation. In 2016, the FAA issued more than 9,500 ATP certificates, which includes more than 2,100 R-ATP certificates. In 2016, our research revealed that the airlines hired somewhere between 3500-4000 pilots, which is considerably fewer than the number of pilots who were qualified to fly for the airlines that year.

Flight Training Costs Not Impacted by FOQ

The FOQ rules have not driven increases in flight training costs. The flight training a pilot is required to receive to obtain a commercial pilot certificate is the same today as it has been for decades. Once pilots achieve their commercial pilots certificate, they stop paying for their flight time. Instead, pilots obtain commercial flight experience through paid employment as flight instructors, corporate, cargo, or charter pilots. The hours and experience garnered in these entry-level commercial flight environments are critical to the successful creation of a well-trained, experienced, and fully qualified airline pilot.

Pilot Experience before Airline Flying is Critical

The length of time from when a pilot obtains their commercial pilots license to when they have accumulated the hours and flight experience necessary to qualify for the ATP or R-ATP certificate is measured in months, not years or decades. Pilots who graduate from an accredited, structured university that are qualified for the R-ATP pathway can currently expect to spend 12 months flying in entry level commercial operations before transitioning to an airline.

Because each airline conducts training differently, and because they use different terminology and require pilots to adapt to procedural philosophies that are most likely unique, there will be some adjustments needed by pilots. While regional airlines would like pilots to come pre-programmed from a flight training environment that minimizes the adjustments needed by pilots entering an airline's flight training

environment, the pilots are also bringing with them real-world experience that includes a variety of weather, terrain, and air traffic control environments.

It is important to note that airlines do NOT provide ANY training or provide pilots with aircraft to obtain experience in factors such as weather (e.g., thunderstorms, snow, tropical storms), terrain (e.g., high altitude, mountain flying), and high-density air traffic (e.g., New York City and Los Angeles metroplex). Today's flight simulation environment cannot adequately replicate these factors. Therefore, it is critical for pilots to obtain flight time and experience in commercial operations after they have obtained the commercial pilots license, but before being inserted into the Part 121 airline operating environment. The FAA wisely recognized that the combination of an accredited university, structured FAA approved flight training, and some commercial piloting experience in pre-airline commercial operations was the best and safest training pathway to fully address the shortcomings identified from fatal passenger airline accidents.

Pilot Supply Isn't Driving Airline Service Changes

The changes in airline services to any airport large or small, are driven by several variables including passenger demand, an airline's access to an appropriately sized aircraft, economic incentives, access to ground services and equipment. Like any other business, however, airlines must decide where they are able to profitably provide affordable air transportation services. Airlines change service levels to all airports on a regular basis. As just one example, last November, Southwest airlines

announced that it would end service to Flint, Michigan. But the company was clear about the true reason for the change in service: the airport was not a good business fit. The same issue that Southwest airlines admitted to in Flint, Michigan (see: http://www.mlive.com/news/flint/index.ssf/2017/11/southwest_airlines_pulls_plug.html) is an issue in other small communities as well.

Other considerations include proximity to larger airports with air travel that is less expensive due to the use of larger aircraft. Sometimes, airlines enhance the service to small communities by changing from a propeller aircraft to jet aircraft, which adds seats in almost all cases. By adding seats, the airline reduces the frequency of the flights but may actually provide more capacity than with propeller aircraft. ALPA is a strong proponent for ensuring that all Americans have access to passenger airline services, and when possible the services should be made available to the small communities across the nation. Lowering safety standards will not increase service to small communities it will simply make flying to those communities more dangerous. There are other rules and policies that can be changed to more fully support air travel from small communities.

Flight Training Enrollments Are Increasing, Not Decreasing

Several accredited universities with flight training programs have stated that enrollments of professional pilot students are significantly higher this year as compared to last year, and demand for future years remains strong. This is a strong indicator that the R-ATP pathway that is available to students who enroll at

accredited aviation colleges and universities is working. Pilots can and do complete a two- or four-year university degree program and accumulate 12-18 months of flying experience in entry-level commercial aviation employment before progressing to airline flying.

By calling for changes to safety rules as their number one solution to their business problem, these other interested parties are telling the traveling public and elected officials that they need to accept reduced levels of safety in pilot training and qualifications so that business problems can be fixed. They are saying that no other law, regulation, or policy change in all of the United States code, and associated regulations can solve their problem. Intentionally or otherwise, they are also telling the traveling public that they need to accept reduced levels of safety when flying to small communities. They are telling the public that we need to go back to the way it was in February 2009.

Pilot free market supply and demand will dictate if we continue to have enough pilots in the future, ALPA and the flying public will not accept a reduction in safety in an attempt to influence the pilot supply free market.

Those few regional cargo and passenger airlines that report a shortage of pilots typically offer lower salaries and benefits, poor work-life balance, and fewer opportunities for career progression than airlines that are not reporting such a shortage. Qualified pilots have many employment opportunities and some regional

airlines have realized that to attract qualified candidates, they have to be competitive in salary and benefits to attract pilots.

We urge the committee to seek to understand the issues that appear to be forcing the airlines and small community airport advocates to call for changes in safety rules, in order to fix a problem that is purely about economics. Travelers in the United States should not be required to sacrifice levels of safety to access airline travel from their home airports. But weakening first officer qualification rules attempt to do just that.

Safe Shipments of Hazardous Materials

ALPA has long advocated for improved transport requirements for hazardous materials. As witnessed in 2015 with hoverboards, and again last winter with the Samsung Galaxy Note 7, lithium batteries and other hazardous materials can create real safety threats in the absence of proper regulations. Mitigating the risk to aviation safety from hazardous materials requires a focus on two specific areas: improving hazardous materials regulations and eliminating shipments of undeclared hazardous materials.

The significant consumer demand for these high-density power sources has resulted in rapid expansion in lithium battery production, supply, and proliferation. Consequently, this hazard is increasing exponentially. While lithium batteries represent a significant technological improvement over older battery technology, their high energy density and flammability make these batteries more prone to

failure, resulting in fire and explosion. The lack of comprehensive hazardous materials regulations for the carriage of lithium batteries as cargo onboard commercial aircraft, both passenger and cargo, continues to pose risks to air transportation.

New standards implemented by the International Civil Aviation Organization (ICAO) on April 1, 2016, made significant improvements to provisions under which lithium batteries are shipped as cargo by air around the globe. And while the Department of Transportation has begun the process of harmonizing these into the U.S. regulations, no proposed or final rule has been issued after 22 months. We were very pleased to see language included in H.R. 2997 to require DOT to harmonize its regulations with the new ICAO standards.

While the ICAO limitations are a good first step, they do not go far enough in addressing the safety risk created by lithium batteries. Work must continue to develop and mandate performance-based packaging standards that will prevent and/or contain a lithium battery fire. These standards must also address the threat from external fires.

In the FAA Modernization and Reform Act of 2012 (P.L. 112-95), Section 828, Congress directed the DOT not to regulate lithium batteries carried as cargo on aircraft stricter than the ICAO standards unless a fire onboard an aircraft could be proven to have substantially contributed to a fire involving lithium batteries in the

cargo hold. There have now been three such accidents (UPS 1307, UPS 6, and Asiana 991), two of which were fatal to the pilots on board and all three of which destroyed the aircraft. The accident reports attribute lithium batteries as a large factor in all of these events.

The National Transportation Safety Board (NTSB), following the most recent accident involving Asiana Airlines Flight 991, issued a safety recommendation stating that it "believes that the circumstances and findings in the Asiana Flight 991 accident constitutes such credible evidence that demonstrates a deficiency in cargo-segregation requirements that would permit the HMR [hazardous materials regulations] to be changed to be more stringent than the current ICAO requirements."

ALPA agrees with the NTSB that the threshold set by legislation has been met and it is time to move forward on comprehensive regulations governing cargo shipments of lithium batteries.

Hazardous materials, comprised of liquids, flammables, and other materials, shipped as cargo without being identified by the shipper are considered undeclared hazardous materials. There are no official estimates of what percentage of parcel shipments contain undeclared hazardous materials; however, the FAA tracks incidents where hazardous materials shipments create safety hazards for various reasons, such as a leaking package or other type of external evidence that the package

is a safety concern. In 2015, the FAA received 1,129 reports of such events, and 564 of the incidents involved undeclared hazardous materials.

ALPA's research indicates that the biggest weakness in the shipment of hazardous materials by air is the reliance on an "honor system" approach by the airlines and regulators. Increased attention to and accurate data is needed to eliminate undeclared hazardous materials shipments by air.

FAA Leads the Way on Portable Device Safety in Checked Baggage

ALPA concerns about lithium battery fires in checked luggage spiked early in 2017 when security issues drove many passengers to store their large personal electronic devices in their checked baggage.

We were pleased to see that the FAA has taken the significant step at ICAO to propose a prohibition of installed lithium batteries in certain electronic equipment from checked baggage on passenger aircraft. ALPA fully supports this proposal, which was based on testing conducted by the FAA at the William J. Hughes Technical Center (the Technical Center), outside of Atlantic City, New Jersey. The FAA expertise and rigor applied to the testing, and proposal development is to be commended.

Safe Integration of Unmanned Aircraft Systems

With the rapidly growing use of Unmanned Aircraft Systems (UAS) for any number of applications and uses, the safety risks to airline operations needs to be monitored

very closely. We applaud this committee's commitment to ensure UAS safety, by holding a hearing at the end of last year on the topic, and by probing the need for a robust risk mitigation plan. Clearly, at some point in the future, UAS will be integrated into the national airspace system (NAS), interacting with other aircraft in a manner similar to "pilot on board" aircraft today.

However, it seems at times that the FAA is struggling to keep pace with the expansion of the UAS industry. We must not allow pressure to rapidly integrate UAS into the NAS without appropriate safeguards in place. This process must be focused on safety as the highest priority. Risk mitigation plans, which have yet to be fully developed, combined with consensus-based technology standards that will ensure interoperability with manned aircraft, must be in place before a UAS can occupy the same airspace as manned aircraft or operate in areas where it might inadvertently stray into airspace occupied by airliners. When UAS operate in the same airspace as airline aircraft, the pilots will need to be able to see them on cockpit displays, and air traffic controllers will also need to see them on their displays to safely separate air traffic. Further, the UAS must be equipped with active collision-avoidance technology. We will oppose any integration that does not include collision avoidance systems that are interoperable with airline collision avoidance systems.

If a UAS operator does not intend to fly in the same airspace as airliners, then limitations that ensure that the UAS stays out of the airspace must be programed into the UAS in a way that cannot be overridden.

FAA Authority to Fully Regulate all UAS

The FAA has established 14 CFR Part 107, which are rules for small UAS (sUAS). The regulatory framework created is limited to commercial operations only. This is because Congress prohibited the FAA from promulgating any new rules on "hobbyists" operators in Section 336 of P.L. 112-95 of the FAA Modernization and Reform Act of 2012. This law was cited in an appeals court decision in early 2017 that struck down the FAA regulatory requirement that requires all operators of sUAS that weigh more than .55 pounds to register with the FAA. Fortunately, this committee's bill - HR-2997-- includes a provision that would legislate the FAA's authority to require registration of all sUAS above the minimum weight threshold of 0.55 pounds. Additionally, Congress saw fit to include this same registration requirement in the annual National Defense Authorization Act signed into law in December 2017 and ALPA was fully supportive of this effort.

The prohibition against the FAA's authority to regulate hobbyist sUAS also creates an interesting situation where commercial sUAS pilots who are certified by the FAA have more operational restrictions on them than the hobbyist operators. While commercial sUAS operators must obtain explicit approval from air traffic control to operate in the vicinity of an airport with an operating control tower, model/hobby sUAS operators merely need to advise ATC. This seems somewhat counter-intuitive from a safety perspective. The operators who are not trained, and who have not been

issued a certificate from the FAA, should have more safety restrictions than commercial operators.

As has been widely reported, a drone recently collided with a U.S. Army helicopter one mile east of Midland Beach in Staten Island, New York. From the investigation, we know that a Temporary Flight Restriction (TFR) was in effect for the area of the flight, the UAS was not equipped with any type of identification or tracking technology. The National Transportation Safety Board used pieces of the sUAS that were found lodged in the aircraft, and using the information from these pieces, the hobbyist pilot of the sUAS was identified and located. The individual operating the sUAS routinely operated his hobby aircraft in the vicinity of the collision site, which was beyond his visual line of sight. After losing control of the aircraft, and because it failed to return to his position, he indicated that he simply believed his aircraft had "gone down" and he was unaware that it had been involved in a mid-air collision.

In another recently reported event, a drone appears to have captured video of an ALPA-crewed airline aircraft flying underneath the drone while on approach to landing. In light these situations, we have reached out to all members of Congress with the support of other organizations, calling for it to give the FAA the ability to fully regulate all UAS operations.

And we say it again today, ALPA strongly urges the committee to remove the current restrictions that Congress has placed on the FAA's ability to fully regulate all UAS,

including hobby sUAS. We are not calling on Congress to apply overly restrictive and burdensome regulations on the recreational segment of the sUAS industry. However, we are calling on Congress to allow the FAA to use its regulatory authority to address the known and constantly increasing risk to airline safety.

sUAS Identification and Tracking Technologies are Needed

ALPA also encourages Congress to work closely with the FAA to implement mandatory identification and tracking capabilities as quickly as possible. An aviation rulemaking committee (ARC) recently concluded its work in this very important area, and provided the FAA with recommendations that should result in a regulatory framework that increases safety and addresses security concerns as well. ALPA participated on the ARC, and I can tell you that a very diverse group of participants worked very well together to achieve excellent results.

If an identification and tracking system had been in place prior to the October collision with the Army helicopter, much more information would have been immediately available to accident investigators and law enforcement. Such a system would likely have prevented the collision in the first place, because law enforcement may have observed the sUAS operating on a previous flight, and proactively contacted the hobbyist about the illegal use of the aircraft. Until there is a way for law enforcement to identify and track down the sUAS pilots, there is very little incentive for non-conformist hobby operator to do so safely.

Strengthening the Voluntary Safety Reporting Programs

Voluntary safety reporting programs such as the Aviation Safety Action Program (ASAP) and Flight Operations Quality Assurance (FOQA) are important, collaborative tools that enhance aviation safety through the analysis of voluntarily reported safety events and discrepancies that lead to the prevention of accidents and incidents. The purpose of ASAP and FOQA is to encourage and use voluntarily reported safety information provided by frontline employees and airlines, respectively, to identify safety risks. Without these valuable safety reports, unidentified risks go unmitigated and remain within the system.

For example, more than a decade ago the implementation of stabilized approach technology and procedures became a top safety priority upon discovering the frequency of non-stabilized approaches being reported by pilots. More recently, data sources have been combined to identify potential risks that are initially identified through the voluntary safety programs. Ground radar data, historical weather information, and other data sources were used to identify instances when aircraft traffic and terrain warning systems were repeatedly alerting to false alarms. These voluntary safety programs triggered these studies, which ultimately led to the discovery that improvements to airspace and procedures design would reduce the false alarms. These examples prove that the underlying voluntary safety program reporting by the operators is the best source to identify potential risk areas and to investigate and ultimately mitigate these risks.

Automatic Acceptance

We can improve and increase the safety benefit of ASAP and voluntarily submitted aviation safety information by automatic acceptance of ASAP reports. Several programs already have automatic acceptance protocols built in (e.g., American and Delta Air Lines). However, where ASAP reports are not automatically accepted, the safety benefit is delayed, sometimes by weeks or longer, waiting for an Event Review Committee (ERC) to meet, review, and accept these reports. Under an automatic-acceptance scenario, the safety benefit of the information would be realized immediately. However, a report could be excluded when the ERC convenes and it is determined to meet established exclusionary criteria. The automatic acceptance model works and should be universal to ASAP. ALPA is pleased that HR 2997 includes this very important provision.

Addressing Cargo Safety

Many of the safety and security layers working to protect our passenger airline industry are absent from all-cargo operations. Cargo airlines fly the same aircraft, takeoff and land from the same airports, utilize the same airspace, and fly over the same cities as passenger aircraft. From a safety and security standpoint, there is every reason to hold all-cargo operations to the same standards as passenger operations. All-cargo airline operations currently experience an accident rate that is seven times higher than passenger airline operations worldwide.

While many of the same regulations are used for both commercial passenger and all-cargo airlines, there are lesser requirements placed on all-cargo operations in several very important areas, which results in unnecessary safety risk.

One example of this safety double standard between cargo and passenger operations is flight crew flight, duty, and rest regulations. While new flight- and duty-time regulations for passenger operations were issued in 2011 and implemented in 2014, those rules apply only to flight crew members at passenger airlines and do not include all-cargo pilots. The FAA's original rule included all pilots, passenger, and cargo operations, but the cargo sector was removed by the Office of Management and Budget due to a flawed cost-benefit methodology. We believe that science-based flight, duty, and rest regulations must be developed for flight crew members of all-cargo operations.

Another example of a safety gap is that all-cargo operations are exempted from Aircraft Rescue and Fire Fighting (ARFF) requirements contained in 14 CFR Part 139. This means that ARFF is not required to be staffed or even present at airports during operations of cargo aircraft.

Further, cargo aircraft carry some very hazardous cargo such as blood-borne pathogen, chemical, and even radioactive material. Not only should ARFF be staffed during cargo operations, but ARFF personnel must be trained for dealing with fires on cargo airliners. Measures need to be developed and implemented that will

properly prepare firefighters for dealing with a cargo aircraft fire. There is a lack of proper ARFF equipment needed to fight all-cargo aircraft fires at some airports, including nozzle tips designed for penetrating cargo airliner hulls, and a lack of funding, because the exemption of cargo from 14 CFR Part 139 requirements interferes with fire departments' ability to get the money they need for staffing, equipment, training, and developing strategy for cargo-specific events.

ALPA has maintained a strong stance that all-cargo operations must have the same level of safety as passenger airlines. The facts however, speak for themselves. The United States fatal accident rate of all-cargo operations is significantly higher than that of passengers. In the same period that there have been no fatal passenger accidents on U.S. airlines, there have been several fatal cargo accidents. These facts are the reason why ALPA has invested our resources in the efforts of the Commercial Aviation Safety Team (CAST) and their technical groups, to identify the differences between passenger and all-cargo that need to be addressed. We appreciate the Committee's support of the work being done by CAST and the Aviation Safety Information Analysis and Sharing (ASIAS) activity. We know that with the support of Congress, we will achieve the safety goals that all are striving to achieve.

ALPA and Aviation Safety

We appreciate the committee's invitation to offer our insights and perspectives on these important safety issues. More importantly, we appreciate the leadership that is being exerted by the committee to advance these high-priority safety issues. The

airline industry is best positioned to fully meet the needs of all passengers and shippers when safety levels remain at their current levels. It is in our collective best interest as legislative leaders, labor organizations, companies, and regulators, to ensure the foundation of safety is solid, and continues to lead the rest of the world. I look forward to working these issues with you in the coming months as we strive to make meaningful safety improvements to aviation in the work we are doing together.

Captain Tim Canoll, President, Air Line Pilots Association, International, responses to questions for the record issued by Rep. Daniel Lipinski of Illinois

Required Experience for R-ATP Certification (To ALPA)

The FAA gives credit toward the minimum requirements to former military pilots and graduates of certain flight training institutions. Often, these pilots have had advanced training in simulators capable of testing scenarios that wouldn't otherwise be safe to demonstrate in the real world. In your opinion, should more credit be given for simulator time? Are simulators more useful for developing skills than, say, accruing time as a flight instructor, when the pilot gains hours just watching another pilot fly?

ANSWER: Simulators are good for training standard operating procedures and practicing flight maneuvers that are performed during normal operations as well as some selected system and aircraft malfunctions. Simulators don't accurately reflect the real world of line operations that are subject to dynamically changing weather and operating scenarios. The use of simulators is conducted with the assumption that the pilot already has a base level of understanding that he or she gained during his or her hours of flight experience. That baseline is used as a foundation for them to learn in a simulator the procedures of a particular aircraft model.

Every hour of flight is valuable and provides a base of understanding of the dynamics of flight that's transferable across all aircraft. Pilots develop judgment and decision-making skills based on experience in real-world conditions. Regardless of the aircraft they fly, they still have to work with ATC, the weather, and aircraft issues, so that's transferrable experience. Most pilots who are building toward an ATP or an R-ATP get those flight hours in corporate, business aviation, and/or other forms of commercial experience before moving to the airlines. They perform Part 135 flight operations such as air taxi services and in-flight instruction, which are done in real-world "dynamic" conditions such as shifting weather, changing communications, and developing aircraft maintenance issues.

ALPA's position is that any reduction in the 750, 1,000, 1,250, or 1,500 flight hours required is a step away from a safe system toward a less-safe system.

United States Court of Appeals

FOR THE DISTRICT OF COLUMBIA CIRCUIT

Argued March 10, 2017 Decided July 28, 2017

No. 16-1101

FLYERS RIGHTS EDUCATION FUND, INC., D/B/A FLYERSRIGHTS.ORG, AND PAUL HUDSON,
PETITIONERS

v.

FEDERAL AVIATION ADMINISTRATION, ET AL.,
RESPONDENTS

On Petition for Review of an Order of
the Federal Aviation Administration

Joseph E. Sandler argued the cause and filed the briefs for petitioner.

Karen Schoen, Attorney, U.S. Department of Justice, argued the cause for respondents. With her on the brief were *Benjamin C. Mizer*, Principal Deputy Assistant Attorney at the time the brief was filed, and *Mark B. Stern*, Attorney.

Before: ROGERS, MILLETT, and PILLARD, *Circuit Judges*.

Opinion for the Court filed by *Circuit Judge* MILLETT.

Opinion concurring in part and concurring in the judgment filed by *Circuit Judge* ROGERS.

MILLETT, *Circuit Judge*: This is the Case of the Incredible Shrinking Airline Seat. As many have no doubt noticed, aircraft seats and the spacing between them have been getting smaller and smaller, while American passengers have been growing in size. Paul Hudson and the Flyers Rights group became concerned that this sharp contraction in passenger seating space was endangering the safety, health, and comfort of airline passengers. So they petitioned the Federal Aviation Administration to promulgate rules governing size limitations for aircraft seats to ensure, among other things, that passengers can safely and quickly evacuate a plane in an emergency. The Administration denied the petition, asserting that seat spacing did not affect the safety or speed of passenger evacuations. To support that conclusion, the Administration pointed to (at best) off-point studies and undisclosed tests using unknown parameters. That type of vaporous record will not do—the Administrative Procedure Act requires reasoned decisionmaking grounded in actual evidence. Accordingly, we grant the petition for review in part and remand to the Administration.

I

A

Congress has charged the Federal Aviation Administration with ensuring the safety and security of commercial airline passengers. *See* 49 U.S.C. §§ 44701, 40101(d); *see also Wallaesa v. Federal Aviation Admin.*, 824 F.3d 1071, 1079 (D.C. Cir. 2016). In fulfilling that role, the Administration has "'*plenary authority* to [m]ake and enforce safety regulations governing the design

and operation of civil aircraft' in order to ensure the '*maximum possible safety.*'" *Bargmann v. Helms*, 715 F.2d 638, 642 (D.C. Cir. 1983) (alteration in original) (quoting H.R. REP. NO. 2360, 85th Cong., 2d Sess. 2, 7 (1958)).

As relevant here, the Federal Aviation Act charges the Administration with "promot[ing] safe flight of civil aircraft in air commerce by prescribing * * * minimum standards required in the interest of safety for * * * the design, material, construction, quality of work, and performance of aircraft," as well as "regulations and minimum safety standards for other practices, methods, and procedure[s] * * * necessary for safety in air commerce[.]" 49 U.S.C. § 44701(a)(1), (5). When issuing such minimum safety standards and regulations, the Administration must consider "the duty of an air carrier to provide service with the highest possible degree of safety in the public interest[.]" *Id.* § 44701(d)(1)(A). In addition, the Administration "shall consider the following matters, among others, as being in the public interest: (1) assigning, maintaining, and enhancing safety and security as the highest priorities in air commerce[, and] (2) regulating air commerce in a way that best promotes safety and fulfills national defense requirements." *Id.* § 40101(d)(1), (2). The Administration thus has broad authority to promulgate regulations "reasonably related to safety in flight." *Wallaesa*, 824 F.3d at 1079 (internal quotation marks and citation omitted).

Members of the public may petition the Administration to promulgate, amend, or repeal regulations. *See* 49 U.S.C. § 106(f)(3)(A); 14 C.F.R. § 11.61(a). Such a petition must include, among other things, the purpose of the proposed action, an "explanation of why [the] proposed action would be in the public interest," and "[a]ny specific facts or circumstances that support" the proposed action. 14 C.F.R. § 11.71(a). Once it receives a petition, the

Administration has six months to respond either "by dismissing such petition[], by informing the petitioner of an intention to dismiss, or by issuing a notice of proposed rulemaking or advanced notice of proposed rulemaking." 49 U.S.C. § 106(f)(3)(A); *see* 14 C.F.R. § 11.73(a), (e).

B

On August 26, 2015, Paul Hudson and the non-profit organization Flyers Rights Education Fund of which he is president (collectively, "Flyers Rights") petitioned the Administration to promulgate rules governing the minimum requirements for seat sizes and spacing on commercial passenger airlines. In its petition, Flyers Rights provided evidence that commercial airline seat and spacing dimensions have steadily decreased in size over the last several decades. The petition noted that economy-class "seat pitch"—the distance between a point on one seat and the same point on the seat directly in front of it—has decreased from an average of 35 inches to 31 inches, and in some airplanes has fallen as low as 28 inches. Evidence in the petition further indicated that average seat width has narrowed from approximately 18.5 inches in the early-2000s to 17 inches in the early- to mid-2010s. The petition also noted that, since the 1960s, the average American flyer had grown steadily larger in both height and girth. Flyers Rights expressed concern that the decrease in seat size, coupled with the increase in passenger size, imperiled passengers' health and safety by slowing emergency egress and by causing deep vein thrombosis (a potentially fatal condition involving blood clots in the legs),

as well as "soreness, stiffness, [and] other joint and muscle problems." Pet. for Rulemaking 6.[1]

Accordingly, Flyers Rights asked the Administration to: promulgate regulations that would (i) "set[] maintenance standards and limit[] the extent of seat size changes [on commercial airlines] in order to ensure consumer safety, health, and comfort"; (ii) "plac[e] a moratorium on any further reductions in seat size, width, pitch, padding, and aisle width until a final rule is issued"; and (iii) "[a]ppoint an advisory committee or task force to assist and advise the [Administration] in proposing seat and passenger space rules and standards[.]" Pet. for Rulemaking 3.

On February 1, 2016, the Administration denied Flyers Rights' petition for rulemaking. The Administration explained that, in addressing petitions for rulemaking, it weighs: "(1) [t]he immediacy of the safety or security concerns * * * raise[d], (2) [t]he priority of other issues the [Administration] must deal with, and (3) [t]he resources we have available to address these issues." Denial of Pet. for Rulemaking 1; *see also* 14 C.F.R. § 11.73(a). The Administration then concluded that Flyers Rights' concerns

---

[1] Flyers Rights is not alone in its concerns. *See* Press Release, Office of the Hon. Steve Cohen, Tenn. 9th Dist., Reps. Cohen and Kinzinger, Senators Blumenthal, Schumer, Markey, Menendez and Feinstein Introduce Bipartisan, Bicameral SEAT Act (March 9, 2017), https://cohen.house.gov/media-center/press-releases/reps-cohen-and-kinzinger-senators-blumenthal-schumer-markey-menendez-and [https://perma.cc/KL7J-GE62] (last accessed July 21, 2017) ("The average distance between rows of seats has dropped from 35 inches before airline deregulation in the 1970s to about 31 inches today. The average width of an airline seat has also shrunk from 18 inches to about 16½.").

did not warrant action because the issues raised "relate[d] to passenger health and comfort, and d[id] not raise an immediate safety or security concern." Denial of Pet. for Rulemaking 2. The Administration reasoned that it already "require[s] full-scale evacuation demonstrations and analysis that set the limit for the maximum number of passengers for any given airplane model," including for aircraft with "interior configurations that are more critical (less seat pitch and higher number of passengers) than most configurations operated by the airlines," and that emergency egress tests "have been successfully conducted at 28- and 29-inch pitch[.]" *Id.* The Administration added that "[s]eat pitch alone does not determine the amount of space available between seats * * * [because] modern, thinner seats at lower seat pitch provide more space than older seats did at higher pitch." *Id.* The Administration further noted that the medical concerns identified in the petition exist "irrespective of the seat pitch[.]" *Id.* With respect to Flyers Rights' concerns about deep vein thrombosis, the Administration concluded that the condition was "rare"; it can occur with "any long-duration seated activity"; and its risks are "the same for economy-class and business-class." *Id.*

The Administration's denial of the petition for rulemaking did not cite any studies or tests to corroborate its representations. Nor did it challenge Flyers Rights' characterization of seat dimension decreases or passenger size increases.

Flyers Rights sent a follow-up letter to the Administration's Director of the Aircraft Certification Service asking the Administration to "formally cite the study(ies) [it] * * * rel[ied] on" in denying the petition. J.A. 173. In response, the Administration identified a series of its own reports on airplane emergency egress and links to medical

websites that discussed deep vein thrombosis. The studies cited in the letter did not address the impact of smaller seat dimensions or increased passenger size on the ability of passengers to expeditiously leave their seats and reach the emergency exits.

Dissatisfied with the Administration's unsubstantiated representations about matters of passenger health and safety, Flyers Rights timely petitioned this court for review.

II

We review the Administration's actions to determine whether they were "arbitrary, capricious, an abuse of discretion, or otherwise not in accordance with law." *Safe Extensions, Inc. v. Federal Aviation Admin.*, 509 F.3d 593, 604 (D.C. Cir. 2007) (quoting 5 U.S.C. § 706(2)(A)). Under that standard, we will reverse "only if the agency's decision is not supported by substantial evidence, or the agency has made a clear error in judgment." *Id.* (citation omitted). Upon review, we may "affirm, amend, modify, or set aside any part of the order and may order the * * * Administrat[ion] to conduct further proceedings." 49 U.S.C. § 46110(c).

Because Flyers Rights challenges the Administration's decision not to engage in rulemaking—the Administration's *inaction*—our review is "extremely limited." *WildEarth Guardians v. EPA*, 751 F.3d 649, 651 (D.C. Cir. 2014) (citation omitted); *see Massachusetts v. EPA*, 549 U.S. 497, 527 (2007) ("narrow" review of agency decision not to act). That is because an agency has "broad discretion to choose how best to marshal its limited resources and personnel to carry out its delegated responsibilities." *Massachusetts*, 549 U.S. at 527; *see also Defenders of Wildlife v. Gutierrez*, 532 F.3d 913, 919 (D.C. Cir. 2008) ("[A]n agency's refusal to

institute rulemaking proceedings is at the high end of the range of levels of deference we give to agency action under our 'arbitrary and capricious' review.") (internal quotation marks and citation omitted).

In reviewing such decisions, we ask "whether the agency employed reasoned decisionmaking in rejecting the petition," *Defenders of Wildlife*, 532 F.3d at 919, and we will overturn the agency's decision "only for compelling cause, such as plain error of law or a fundamental change in the factual premises previously considered by the agency," *WildEarth Guardians*, 751 F.3d at 653 (internal quotation marks and citation omitted). Our review turns, more specifically, on whether the agency "adequately explained the facts and policy concerns it relied on and [whether] * * * those facts have some basis in the record." *Id.* (alterations in original; citation omitted).

III

Flyers Rights challenges two aspects of the Administration's denial of its petition for rulemaking: (1) its conclusion that current seat pitch and width, as well as passenger size, do not negatively impact emergency egress, and (2) its denial of authority to consider matters related to passenger health and comfort. We agree with Flyers Rights that the Administration failed to provide a plausible evidentiary basis for concluding that decreased seat sizes combined with increased passenger sizes have no effect on emergency egress. But we disagree with Flyers Rights' challenge to the Administration's declination to regulate matters of physical comfort and routine health.

Emergency egress

Flyers Rights' petition for rulemaking reasonably identified a safety concern arising from the commercial airlines' documented pattern of placing ever larger passengers in ever smaller seats with still less space between them. The petition explained why such seating constrictions could make it more difficult for passengers to quickly leave their seats and escape an aircraft in the event of an emergency. Specifically, the petition asserted that, in an emergency, decreased seat spacing would increase panic, delay access to the center aisle, and impede the escape of injured passengers. The petition also included multiple comments from airline passengers expressing safety concerns. One commenter stated that current seat spacing made it "necessary to climb onto [her] seat to get out." J.A. 167. Another commenter asserted that, given current seat spacing, "[i]n an emergency, there is no way we would have been able to get to an exit row in less than three or four minutes[.]" J.A. 169.

The Administration has a broad mandate to protect and promote passenger safety. Ensuring that all passengers can rapidly evacuate an airplane is of central importance to that safety mission. *See* 14 C.F.R. § 25.803(c) (requiring that aircraft with a capacity of more than forty-four passengers be capable of evacuation within ninety seconds, and that actual egress demonstrations be undertaken to ensure compliance with Administration regulations). The Administration does not dispute that. Accordingly, when the Administration responds to a petition for rulemaking that exposes a plausible life-and-death safety concern, the Administration must reasonably address that risk in its response.

The Administration failed that task here. In asserting that decreasing seat size and pitch had no effect on emergency

egress, the Administration pointed to certain studies and demonstration tests. But the cited studies say nothing about and do not appear to control for seat pitch, width, or any other seat dimension. Nor do they address or control for how increased passenger size interacts with the current seat dimensions to affect emergency egress. Studies cannot corroborate or demonstrate something that they never mention or even indirectly address.

The Administration argues that the omission of information about seat dimensions from the tests means that seat dimensions are categorically unimportant to emergency egress. That makes no sense. Tests generally require a limited number of variables to be workable and verifiable. The omission of other variables says nothing about such variables' relevance to what is being tested; it says only that they were not recorded, measured, or altered for that particular test. Take, for example, a study on tooth decay that only recorded participants' sugar consumption. The study's silence on the question of brushing and flossing would surely not imply that brushing and flossing have no effect on the risk of getting a cavity.

The Administration's rationale also blinks reality. As a matter of basic physics, at some point seat and passenger dimensions would become so squeezed as to impede the ability of passengers to extricate themselves from their seats and get over to an aisle. The question is not whether seat dimensions matter, but when.

Indeed, an Administration study that addressed passenger size in a slightly different context actually corroborates Flyers Rights' point. The study considered, among other things, the ability of wider passengers to pass through the emergency exit row and door. Importantly, this test found that increased

passenger width had the greatest effect on exit speed of all the variables tested. *See* J.A. 89 (chart indicating "[w]aist [s]ize" had the largest "[r]elative [m]agnitude of [e]ffect[]" of the ten variables tested). Yet nowhere did the Administration explain why passenger size would impede progress through the relatively wide emergency exit rows, yet have no impact on passenger movement through the far more cramped (seat-pitch-decreased) seating rows.[2]

The Administration also overlooks that its studies are outdated. They were conducted in the 2000s when, according to the petition, seat dimensions were larger. Agency reasoning, however, must adapt as the critical facts change. *See American Horse Prot. Ass'n v. Lyng*, 812 F.2d 1, 5 (D.C. Cir. 1987) ("[A] refusal to initiate a rulemaking naturally sets off a special alert when a petition has sought modification of a rule on the basis of a radical change in its factual premises.").

The Administration points out that evacuation tests must be run with the maximum allowable passenger occupancy for any given aircraft model. *See* 14 C.F.R. § 25.807(g) (regulating the number of passengers allowed in each specified aircraft model to promote emergency egress); *id.* § 25.803(c) (tests must be run with maximum allowable occupancy). The problem for the Administration is that maximum occupancy is not an adequate proxy for cabin-seat or passenger dimensions. Because planes commonly include different seating classes like first class, business class, and

---

[2] A second study in part examined the impact of passenger size on injuries sustained when traveling through the emergency exit door. Notably, that study observed that "physical characteristics (gender, age, waist size, height) [were] previously shown to significantly affect emergency egress[.]" J.A. 39.

economy plus, limiting the number of seats in an aircraft does not limit seat pitch and width in *all of the seats*, and especially in the ordinary economy-class seats. That means that economy-seating pitch could decrease to levels that could impede emergency egress, while the pitch and width in the first class and business class seats would not.

Finally, the Administration stated in its decision that emergency evacuation tests have been successfully run with seat dimensions as small as those being used by commercial airlines. The problem is that not one of those tests is in the record. So they provide no evident support for the Administration's conclusion.

The Administration says they were omitted because the tests are "proprietary." Administration's Br. 13. Of course, an agency may decline to include confidential business information in the public administrative record in certain narrow situations, as long as it discloses as much information publicly as it can. *See MD Pharm., Inc. v. Drug Enforcement Admin.*, 133 F.3d 8, 13 (D.C. Cir. 1998) (upholding an agency's decision not to include confidential business information in the public record of a licensing hearing); *cf. Mead Data Central, Inc. v. United States Dep't of the Air Force*, 566 F.2d 242, 260 (D.C. Cir. 1977) (Under the Freedom of Information Act, "[i]t has long been a rule in this Circuit that non-exempt portions of a document must be disclosed unless they are inextricably intertwined with exempt portions.").

The problem here is that the Administration has given no reasoned explanation for withholding the tests in their entirety, and it has declined to file them under seal or in redacted form. Yet the Administration explicitly relied on those missing studies in reaching its decision to deny the

petition for rulemaking. *See* Denial of Pet. for Rulemaking 2 ("Full scale evacuation tests on widely used airplanes have been successfully conducted at 28- and 29-inch pitch[.]"); J.A. 178. And the Administration asks the court to trust those studies in reviewing the Administration's decision. *See* Oral Arg. Tr. 29–33; Administration's Br. 11–13.

But that is not how judicial review works. We cannot affirm the sufficiency of what we cannot see. "[A]n agency decision based on 'reliable data reposing in the [agency's] files'" but hidden from judicial view "simply cannot withstand scrutiny." *United States Lines, Inc. v. Federal Maritime Comm'n*, 584 F.2d 519, 535 (D.C. Cir. 1978).

Indeed, we have long held that, when "the data relied on by [an agency] in reaching its decision is not included in the administrative record and is not disclosed to the court[,]" we cannot "determine whether the final agency decision reflects the rational outcome of the agency's consideration of all relevant factors[.]" *United States Lines*, 584 F.2d at 533 (footnote omitted). Whatever deference we generally accord to administrative agencies, "we will not defer to a declaration of fact that is 'capable of exact proof' but is unsupported by any evidence." *McDonnell Douglas Corp. v. United States Dep't of the Air Force*, 375 F.3d 1182, 1190 n.4 (D.C. Cir. 2004) (citation omitted).[3]

---

[3] *See also Safe Extensions*, 509 F.3d at 605 ("[A]n agency's 'declaration of fact that is capable of exact proof but is unsupported by any evidence' is insufficient to make the agency's decision non-arbitrary.") (citation omitted); *cf. Chamber of Commerce of U.S. v. SEC*, 443 F.3d 890, 899 (D.C. Cir. 2006) (for an informal rulemaking, "[a]mong the information that must be revealed for

The problems with the Administration's position do not stop there. Even with respect to its unseen tests, the agency cannot say whether those tests accounted for increased passenger size, which is a critical component of the egress problem raised by Flyers Rights' petition. When questioned at oral argument, counsel for the Administration was unaware whether such tests take into account larger passengers. *See* Oral Arg. Tr. 29, 33–34.

To be sure, the record needed to support an agency's decision not to engage in rulemaking can be sparser than that needed to support rulemaking. Normally, it "need only include the petition for rulemaking, comments pro and con where deemed appropriate, and the agency's explanation of its decision to reject the petition." *WWHT, Inc. v. FCC*, 656 F.2d 807, 818 (D.C. Cir. 1981).

But this case is different because the Administration admits it relied materially on information it has not disclosed, *and* the Administration has pointed this court to that information as a basis for affirmance. Having invited the court into its record, the Administration cannot hide the evidentiary ball. *Cf. CTS Corp. v. EPA*, 759 F.3d 52, 64 (D.C. Cir. 2014) ("It is black-letter administrative law that in an [Administrative Procedure Act] case, a reviewing court should have before it neither more nor less information than did the agency when it made its decision.") (alteration in

---

public evaluation are the technical studies and data upon which the agency relies") (internal quotation marks and citation omitted).

original; internal quotation marks and citation omitted). To do otherwise would reduce judicial review to a rubber stamp.[4]

In short, when an agency denies a petition for rulemaking, the record can be slim, but it cannot be vacuous. Especially so when, as here, the petition identifies an important issue that falls smack-dab within the agency's regulatory ambit. While we do not require much of the agency at this juncture, we do require something. And information critically relied upon by the agency that no one can see does not count. We accordingly remand to the Administration to adequately address the petition and the emergency egress concerns it raises. If the petition for rulemaking is again denied, the Administration must provide appropriate record support for its decision.[5]

---

[4] *See WildEarth Guardians*, 751 F.3d at 653 (a reviewing court must determine "whether the agency adequately explained the facts and policy concerns it relied on and [whether] * * * *those facts have some basis in the record*") (alterations in original; emphasis added; internal quotation marks and citation omitted); *American Radio Relay League, Inc. v. FCC*, 524 F.3d 227, 238 (D.C. Cir. 2008) ("Allowing such omissions in data and methodology may ma[ke] it impossible to reproduce an agency's results or assess its reliance upon them.") (alteration in original; internal quotation marks and citation omitted); *Air Prods. & Chems., Inc. v. FERC*, 650 F.2d 687, 699 (5th Cir. 1981) (noting that "official notice of unspecified information in the files of an agency precludes effective judicial review").

[5] *See generally Florida Power & Light Co. v. Lorion,* 470 U.S. 729, 744 (1985) ("If the record before the agency does not support the agency action, if the agency has not considered all relevant factors, or if the reviewing court simply cannot evaluate the challenged agency action on the basis of the record before it, the

Flyers Rights asks the court to go further and order the Administration to institute rulemaking. That we will not do. "Our cases make clear * * * that such a remedy is appropriate only 'in the rarest and most compelling of circumstances.'" *American Horse Prot.*, 812 F.2d at 7 (quoting *WWHT*, 656 F.2d at 818). Rather, remand is the presumptive remedy when the agency record is insufficient "to permit [the court] to engage in meaningful review." *See id.* (internal quotation marks and citation omitted). Because the Administration claims to have access to the information that would fully justify its denial of the petition for rulemaking, an order to engage in rulemaking is unwarranted at this point.

Health and comfort concerns

Flyers Rights also objects to the Administration's failure to address its concerns regarding passenger health and comfort. More specifically, Flyers Rights' petition worried that cramped seat conditions cause deep vein thrombosis, "soreness, stiffness, [and] other joint and muscle problems[.]" Pet. for Rulemaking at 6. The Administration rejected such concerns partly on the ground that they "relate to passenger health and comfort, and do not raise an immediate safety or security concern." Denial of Pet. for Rulemaking 2.

Flyers Rights argues that the Administration's failure to consider matters of passenger health and comfort is a misinterpretation of its statutory authority, pointing to assorted statutory provisions that purportedly require consideration of "the availability of a variety of adequate,

---

proper course, except in rare circumstances, is to remand to the agency for additional investigation or explanation.").

economic, efficient[,] and low-priced services" and the "develop[ment] and maint[enance of] a sound regulatory system that is responsive to the needs of the public." Flyers Rights' Opening Br. 26 (emphasis omitted) (quoting 49 U.S.C. § 40101(a)(4), (7)). The problem for Flyers Rights is that the cited statutory provisions apply only to the Secretary of Transportation, not to the Administration. *See* 49 U.S.C. § 40101(a).

Flyers Rights also points out that "health" is a component of "safety"—a criterion the Administration without a doubt must consider under applicable statutory provisions. Flyers Rights' Reply Br. 7–9; *see* Flyers Rights' Opening Br. 26–27. *See also* 49 U.S.C. §§ 44701, 40101(d). We agree. We have held that the Administration's statutory authority "embod[ies] a comprehensive scheme for the regulation of the safety aspect[s] of aviation[.]" *Bargmann*, 715 F.2d at 642 (internal quotation marks and citation omitted). That includes protecting passengers' physical health in flight, even from harms that are not occasioned by the flight. Indeed, in *Bargmann*, we rejected the Administration's position that its authority was confined to addressing only those health issues that were "caused or induced by flight." *Id.* at 640 (emphasis and internal quotation marks omitted). We held instead that the Administration has the authority to regulate first aid kits for treating conditions that occur during the flight, whether or not those conditions are caused by flight conditions or operations. *Id.* at 642; *see also Wallaesa*, 824 F.3d at 1080 (reaffirming the Administration's power to regulate "care for ill passengers").

So there is no question that the Administration has the statutory authority to address at least some passenger health issues. *See Wallaesa*, 824 F.3d at 1079–1080 (Administration may regulate medical equipment to ensure "'the personal

safety of the stricken passengers' and crew") (citation omitted); *Bargmann*, 715 F.2d at 642–643 ("Not only are inflight medical emergencies of immediate concern to the personal safety of the stricken passengers, but they may also be of concern to the safety of others.") (citation omitted); 14 C.F.R. § 121, App. A (Administration regulation requiring "automated external [heart] defibrillator[s]" on passenger aircraft).[6]

The problem for Flyers Rights is that, in this case, the Administration acknowledged its authority to protect the health of passengers, stating that it would "continue to monitor seat designs and effects on safety *and health*." J.A. 175 (emphasis added). The Administration thus did not

---

[6] The concurring opinion would hold that Flyers Rights waived reliance on the *Bargmann* line of cases. Concurring Op. 1–3. We respectfully disagree. Flyers Rights pressed the argument that passenger health can be regulated in conjunction with safety in its opening brief. *See* Flyers Rights' Opening Br. 26–27; Flyers Rights' Reply Br. 7–9; Pet. for Rulemaking 3. To be sure, the manner in which Flyers Rights substantiated that argument evolved from its opening to reply brief. But that is not an uncommon occurrence. What matters is that the core of Flyers Rights' argument—that passenger health can be regulated in conjunction with safety—remained the same. And once an argument is before us, it is our job to get the relevant case law right. *Cf. Elder v. Holloway*, 510 U.S. 510, 516 (1994) (when deciding a "question of law," a court "should * * * use its full knowledge of its own [and other relevant] precedents") (second alteration in original; internal quotation marks and citation omitted); *United States v. Rapone*, 131 F.3d 188, 196–197 (D.C. Cir. 1997). Indeed, a party cannot forfeit or waive recourse to a relevant case just by failing to cite it. *See Elder*, 510 U.S. at 514–516; *Metavante Corp. v. Emigrant Sav. Bank*, 619 F.3d 748, 773 n.20 (7th Cir. 2010).

decline to regulate the types of circulatory harms identified by Flyers Rights because it thought it *could not* address such matters. Rather, the Administration decided that it *should not* address those issues at this time, making the very type of regulatory-effort and resource-allocation judgments that fall squarely within the agency's province.

Specifically, with respect to the risk of deep vein thrombosis, the Administration cited evidence showing that it rarely occurs and, regardless, is not caused by seat size or spacing. *See* Denial of Pet. for Rulemaking 2; J.A. 176 (citing a study noting that guidelines issued by the American College of Physicians indicate that deep vein thrombosis is "extremely rare" and that risk of deep vein thrombosis is not any higher in economy class than business class) (citation omitted). Thus, the Administration reasonably declined to initiate rulemaking to assess Flyers Rights' concerns about deep vein thrombosis.

Flyers Rights also noted passenger problems with "soreness, stiffness, [and] other joint and muscle problems" in its petition for rulemaking. Pet. for Rulemaking 6. Given that those conditions are commonplace, temporary, and non-life-threatening discomforts, Flyers Rights' petition failed to demonstrate that the Administration erred in declining to undertake immediate rulemaking.[7]

---

[7] Flyers Rights appears to have abandoned its argument that the Administration must consider passenger comfort when issuing regulations. In any event, the Administration reasonably concluded that matters pertaining exclusively to passenger "comfort" are not within its regulatory wheelhouse. *See* 49 U.S.C. §§ 44701(a), 40101(d).

* * * * *

We grant Flyers Rights' petition for review in part, and remand to the Administration for a properly reasoned disposition of the petition's safety concerns about the adverse impact of decreased seat dimensions and increased passenger size on aircraft emergency egress. We otherwise deny the petition for review.

So ordered.

ROGERS, *Circuit Judge*, concurring in part and concurring in the judgment: I join the court in remanding this matter to the Federal Aviation Administration ("FAA") to address adequately the petition for rulemaking filed by Paul Hudson and the Flyers Rights Education Fund ("petitioners") with respect to concerns about emergency egress from airplanes in light of decreases in seat size and pitch. *See* Op. 9–16. I also join the court in rejecting petitioners' argument that 49 U.S.C. § 40101(a) required the FAA to consider matters of passenger health and comfort. *See* Op. 16–17. Unlike the court, however, I would decline to reach petitioners' additional argument, first raised in their reply brief, that the concept of "safety" in 49 U.S.C. § 44701(a), a term that is not statutorily defined, "inherently includes and is intertwined with the health of passengers." Reply Br. 8. *But see* Op. 17–19.

The court does not usually address arguments first raised in a reply brief, treating them as "waived," in order to "prevent sandbagging of appellees and respondents." *CTS Corp. v. EPA*, 759 F.3d 52, 60 (D.C. Cir. 2014) (quoting *Novak v. Capital Mgmt. & Dev. Corp.*, 570 F.3d 305, 316 n.5 (D.C. Cir. 2009)); *see United States v. Van Smith*, 530 F.3d 967, 973–74 (D.C. Cir. 2008) (citing cases and FED. R. APP. P. 28(c)). This, of course, is not to say that the court should disregard refinements made in a reply brief to an argument properly raised in an opening brief. Here, however, petitioners have offered two distinct theories, based on different statutory provisions, for how the FAA misconstrued the scope of its statutory authority in dismissing passenger health and comfort concerns in responding to the petition for rulemaking — one in their opening brief and the other in their reply brief.

Petitioners contend in their opening brief that the FAA misconstrued its authority by refusing to consider passenger comfort and safety "because it interpreted its own statutory mandate to be limited to safety concerns." Pet'r Br. 26. Although they acknowledge the FAA's safety responsibilities

under Section 44701(a), petitioners do not rely on this provision for their argument and instead maintain that the FAA has statutory duties distinct from its safety responsibilities that require it to consider passenger health and comfort, citing Sections 40101(a)(4) & (7). *See id.* at 26–27. Specifically, petitioners state in their opening brief: "To be sure, the FAA has a statutory responsibility to 'promote safe flight of civil aircraft in air commerce.' 49 U.S.C. § 44701(a). But it *also* has a responsibility, in regulating the industry, to consider a number of *other factors* . . . ." Pet'r Br. 26 (emphasis added). Petitioners then cite various obligations under Section 40101(a) that require consideration of the needs and interests of the public, and contend that *these provisions* create a "clear statutory command" to consider passenger health and comfort concerns. *Id.* at 26–27 (quoting *Massachusetts v. EPA*, 549 U.S. 497, 533 (2007)). In petitioners' view, "the FAA believed, incorrectly, that it was not legally obligated even to consider the 'needs of the public' with respect to passenger health and safety," *id.* at 27, quoting Section 40101(a)(7).

Thus, it is evident that in their opening brief petitioners conceived of health and safety as distinct factors, with the FAA's corresponding health obligations arising under different statutory provisions than its safety responsibilities under Section 44701(a). Only after the FAA pointed out in its responsive brief that Section 40101(a), on which petitioners relied in their opening brief, applies to the Secretary of Transportation rather than the FAA, *see* Resp't Br. 19, did petitioners raise in their reply brief the additional argument that "health" is a component of "safety" under Section 44701(a), Reply Br. 8. As presented by petitioners in their briefs to this court, one statutory theory is not "baked into" the other. The FAA responded in its brief to the only theory presented in petitioners' opening brief and had no opportunity to respond in its brief to petitioners' second theory presented for the first time in their reply brief. Stepping

in, the court offers its own view on how the FAA construes its own authority under Section 44701(a), without the benefit of briefing from the FAA on this question. *See* Op. 18–19.

Petitioners offer no explanation for their failure to raise both arguments in their opening brief, none is apparent from the record, and no extraordinary circumstances excuse their failure to do so. The court seeks to avoid our precedent by suggesting that petitioners' statutory argument simply "evolved" in their reply brief, Op. 18 n.6, but references to arguments presented in the rulemaking petition to the FAA, *see id.*, that petitioners did not, in fact, raise in their opening brief does not eliminate the "sandbagging" of the FAA that has occurred on appeal. After all, litigants may have several reasons to think an agency has erred, but they make choices about which arguments to present on appeal; opposing parties in filing a responsive brief legitimately confine their response to the arguments presented in the opening brief. It is hardly common practice to ignore whether the opposing party has notice of the other party's position, *but see id.*, and this court has tended to take a strict view of the obligation on appealing parties to set forth their arguments in their opening briefs, *see, e.g.*, *Am. Wildlands v. Kempthorne*, 530 F.3d 991, 1001 (D.C. Cir. 2008); *Van Smith*, 530 F.3d at 973–74 (citing cases). Consequently, in accordance with the court's precedent, I would not reach the new statutory theory presented only in petitioners' reply brief.

February 26, 2018

The Honorable Mitch McConnell
Majority Leader
U.S. Senate
Washington, D.C. 20510

The Honorable Paul Ryan
Speaker
U.S. House of Representatives
Washington, D.C. 20515

The Honorable Charles Schumer
Minority Leader
U.S. Senate
Washington, D.C. 20510

The Honorable Nancy Pelosi
Minority Leader
U.S. House of Representatives
Washington, D.C. 20515

Dear Majority Leader McConnell, Speaker Ryan and Minority Leaders Schumer and Pelosi:

As representatives of a broad array of organizations including general aviation pilots, consumer groups, manufacturers, businesses, airports, state and local aviation officials, management associations and unions representing hardworking Americans, we look forward to working with Congress on developing a bipartisan infrastructure package. At the same time, we strongly urge you to oppose any attempts to include a divisive and costly proposal to remove our nation's air traffic control (ATC) system from the Federal Aviation Administration (FAA) in any comprehensive infrastructure bill or in any other legislation.

As you all know, bipartisan support for legislation investing in our nation's infrastructure will be critical to getting a bill to the President's desk. While Congress will face many challenges as it considers a comprehensive infrastructure bill, the divisive ATC privatization proposal which is full of risk and unintended consequences should not be one of them.

The lack of consensus in handing over our ATC system to a board dominated by the airlines and their interests has for almost two years now prevented the House from moving a long term FAA Reauthorization bill. The airlines constantly point the finger at ATC for delays, but the Department of Transportation's own data reveals that airline-caused problems far surpass weather and air traffic control issues. The airlines have repeatedly demonstrated an inability to manage their own operations let alone our already safe ATC system all while taking in over $50 billion in "ancillary fees" from their passengers.

In fact, a recent CNBC poll shows that a majority of Americans oppose privatizing the nation's ATC system. Congress should focus on finding solutions that will garner strong industry support to help rebuild our nation's infrastructure. For the aviation industry, that means modernization not privatization.

Access to our national airspace and ecosystem of airports creates jobs and generates local economic activity which helps make our aviation system work for all Americans. In fact, general aviation alone generates $219 billion in total economic output in the United States and creates 1.1 million jobs.

Our national network of thousands of airports connect many rural communities to the rest of the world and forges a link for small businesses to their suppliers and customers so they can compete in a global economy. To remain competitive, we must ensure that airports of all sizes from small rural general aviation airports to larger commercial hub airports have the resources to expand their infrastructure needs, repair old facilities, or improve aviation safety. Therefore, support for our nation's airports both large and small should be considered in any national infrastructure package.

Another national asset is our ATC system which is the largest, safest, most complex system in the world. While many in the aviation community oppose ATC privatization, everyone agrees on the need to modernize the system. The FAA's NextGen program continues to make progress as several key platforms are either fully deployed or progressing towards full deployment. These achievements are due in large part to the skilled work of FAA employees who operate, manage, maintain, certify and build the NAS. Privatization would disrupt NextGen deployment and distract the focus of those responsible for the safest and most efficient system on earth.

Accelerating investment in NextGen as part of any infrastructure package will expedite the benefits for all users of the system including general aviation, commercial airlines and consumers.

Again, as Congress works to bring our nation's infrastructure into the 21st century, we again urge you to not support the inclusion of the divisive proposal that would hand over our ATC system to a private monopoly. We look forward to working with Congress to find common sense, bipartisan solutions, that create good paying jobs and provide benefits to all aviation users.

Sincerely,

Air Care Alliance
Airborne Law Enforcement Association
Aircraft Electronics Association
Aircraft Kit Industry Association
Aircraft Owners and Pilots Association
Airports Association of North Dakota
Alabama Business Aviation Association
Alaska Airmen Association
American Bonanza Society
American Helicopter Society International
Antique Airplane Association
Arizona Business Aviation Association
Arizona Flight Training Workgroup
Arizona Pilots Association, AZ
Arkansas Airport Operators Association
Association of Air Medical Services
Association of California Airports
Association of Critical Care Transport
Aviation Council of Alabama
Aviation Council of Pennsylvania

Aviation Museum of Kentucky
Balloon Federation of America
Beech Aero Club of Frederick, MD
Bessemer Airport Authority, AL
California Agricultural Aircraft Association
California Pilots Association
Cardinal Flyers Online
Carolina Aviation Professionals Association
Centennial Airport Business Pilot's Alliance, CO
Central Kentucky Regional Airport
Cessna 120/140 Association
Cessna Flyer Association
Cessna Pilots Association
Cessna Pilots Society
Chicago Area Business Aviation Association
Citation Jet Pilot Association
Clark County Aviation Association, NV
Clarksville Regional Airport, TN
Classic Jet Aircraft Association
Colorado Aeronautical Board
Colorado Aviation Business Association
Colorado Pilots Association
Commemorative Air Force
Connecticut Business Aviation Group
Corporate Aircraft Association
Deer Valley Pilots Association, AZ
Duncan Aviation
East Central Ohio Pilots Association
East Tennessee Pilots Club
Eastern Region Helicopter Council
Emergency Volunteer Air Corps
Experimental Aircraft Association
False River Regional Airport, LA
Flight School Association of North America
Florida Aero Club, FL
Florida Aviation Business Association
Flying Dentists Association
Flying Physicians Association
FNL Pilots Association
Friends of Meacham International Airport Association, TX
General Aviation Alliance of Alabama
General Aviation Council of Hawaii

General Aviation Manufacturers Association
Georgia Airports Association
Georgia Business Aviation Association
Glasair Aircraft Owners Association
Granite State Airport Management Association, NH
Greater Houston Business Aviation Alliance, TX
Greater St Louis Business Aviation Association, MO
Greater Waco Aviation Alliance, TX
Greater Washington Business Aviation Association, DC/VA/MD
Helicopter Association International
Houma-Terrebonne Airport, LA
Houston Regional Aviation Professionals, TX
Idaho Airport Management Association
Idaho Aviation Association
Idaho Business Aviation Association
Idaho Contract Tower Coalition
Illinois Pilots Association, IL
Indiana Business Aviation Association
Indianapolis Aero Club, IN
International 180/185 Club
International Aerobatic Club
International Cessna 170 Association
International Council of Air Shows
Iowa Public Airports Association
Jim Pietz Aerosports, SD
Joe Foss Squadron of the Commemorative Air Force, SD
Kansas Association of Airports
Kansas Chamber of Commerce
Kansas City Business Aviation Association
Kansas Pilots Association
Kentucky Aviation Association
Kentucky Business Aviation Association
Lancair Owners and Builders Organization
Lawyer Pilots Bar Association
Light Aircraft Manufacturers Association
Long Beach Airport Association, CA
Long Island Business Aviation Association, NY
Los Angeles Area Helicopter Operators Association, CA
Louisiana Airport Managers Association, LA
Love Field Pilots Association, TX
Maine Aeronautics Association
Malibu/Mirage Owners & Pilots Association

Maryland Airport Managers Association
Massachusetts Airport Management Association
Massachusetts Business Aviation Association
Mckellar Sipes Regional Airport- Jackson, TN
Michigan Business Aviation Association
Mid-Atlantic Aviation Coalition, NJ
Middle Tennessee Aero Club
Minnesota Aviation Trades Association
Minnesota Business Aviation Association
Minnesota Council of Airports
Minnesota Pilots Association
Minnesota Seaplane Association
Mississippi Airports Association
Missouri Pilots Association
Mockingbird Flying Club, SD
Montana Aviation Trades Association
Montana Pilots Association
Monticello Flying Club, VA
Mooney Summit
Morristown Aviation Association, NJ
MU2 Aircraft Owners & Pilots Association
Naples Municipal Airport, FL
National Air Transportation Association
National Association of State Aviation Officials
National Business Aviation Association
Nebraska Association of Airport Officials
Nebraska Aviation Council
Nebraska Business Aviation Association
Nevada Business Aviation Association
New Bedford Regional Pilots Association, MA
New England Helicopter Council
New Jersey Aviation Association
New Mexico Airport Managers Association
New Mexico Pilots Association
North American Trainer Association
North Carolina Agricultural Aviation Association
North Dakota Agricultural Aviation Association
North Dakota Association of Aviation Museums
North Dakota Aviation Council
North Dakota Business Aviation Association
North Dakota Experimental Aviation Association
North Dakota Pilots Association

North Dakota Professional Aviation Mechanics
North Texas Business Aviation Association
Northern California Business Aviation Association
Octopus Flying Club, MD
Ohio Regional Business Aviation Association
Oklahoma Airport Operators Association
Oklahoma Business Aviation Association
Oklahoma Pilots Association
Oregon Airport Management Association
Oregon Aviation Industries
Oregon Pilots Association
Ozark Regional Business Aviation Group, MO
Pacific Northwest Business Aviation Association
Partnership for Corporate Aviation Training, TX
Patient Airlift Services
Piper Flyer Association
Prescott Airport Users Association, AZ
Quincy-Gadsden Airport Authority, FL
Recreational Aviation Foundation
Rhode Island Pilots Association
Russellville Regional Airport, AR
San Antonio Area Business Aviation Alliance, TX
San Carlos Airports Association, CA
Sanderson Farms, MS
Seaplane Pilots Association
Smyrna/Rutherford County Airport, TN
Soaring Society of America
Sonix Builders & Pilots Foundation
South Carolina Aviation Association
South Dakota Pilots Association
South Florida Business Aviation Association
Southern California Aviation Association
Southern Colorado Business Aviation Group
Southern Museum of Flight, AL
Spokane Airport Tenants Association, WA
Stuttgart Municipal Airport, AR
Tampa Bay Aviation Association, FL
Taylorcraft Owners Club
Tennessee Aviation Association
Tennessee Aviation Hall of Fame
Tennessee Business Aviation Association
Teterboro Users Group, NJ

Texans for General Aviation, TX
Texas Corporate Aviation Schedulers and Dispatchers Group
Tiger Flying Club, MD
Twin Cessna Flyer
United States Hang Gliding & Paragliding Association
United States Parachute Association
United States Paragliding Association
Utah Airport Operators Association
Utah Business Aviation Association
Utah General Aviation Association
Van Nuys Airport Association, CA
Velocity Owners and Builders Association
Veterans Airlift Command
Vintage Aircraft Association
Virginia Aviation Business Association
Virginia Highlands Airport
Waco Chamber of Commerce, TX
Warbirds of America
Washington Airport Management Association
Washington Pilots Association
Washington Seaplane Pilots Association
Washington State Aviation Alliance
Washington State Community Airports Association
West Virginia Airport Managers Association
Westchester Aircraft Maintenance Association, NY
Westchester Aviation Association, NY
Wichita Aero Club, KS
WingsReality EDU, ME
Wisconsin Aviation Trades Association
Wisconsin Business Aviation Association
Women in Aviation International
Wyoming Airport Operators Association
Yankton Regional Aviation Association, SD

American Federation of State, County and Municipal Employees (AFSCME)
American Federation of Teachers, AFL-CIO
Department for Professional Employees, AFL-CIO
FAA Managers Association
Federal Managers Association
Marine Engineers' Beneficial Association
Metal Trades Department, AFL-CIO
National Black Coalition of Federal Aviation Employees
National Council of Social Security Management Associations

National Federation of Federal Employees
National Hispanic Coalition of Federal Aviation Employees
National Treasury Employees Union (NTEU)
National Weather Service Employees Organization
Patent Office Professional Association
Professional Air Traffic Controllers Organization, Inc. (PATCO)
Professional Association of Aeronautical Center Employees (PAACE)
Professional Aviation Safety Specialists
Professional Managers Association
Senior Executives Association
United Steelworkers (USW)

Consumer Action
Flyers Rights

Over 100 Mayors from across the U.S. voice opposition to ATC Privatization
https://www.nbaa.org/advocacy/letters/20170306-mayors-house-letter.pdf
https://www.nbaa.org/advocacy/letters/20170306-mayors-senate-letter.pdf

100 Business CEO's from across the U.S. voice opposition to ATC Privatization
https://www.nbaa.org/advocacy/issues/modernization/20170619-CEO-ATC-Letter-House.pdf
https://www.nbaa.org/advocacy/issues/modernization/20170619-CEO-ATC-Letter-Senate.pdf

TESTIMONY FOR THE RECORD

STEPHEN A. ALTERMAN
CARGO AIRLINE ASSOCIATION

BEFORE THE SUBCOMMITTEE ON AVIATION
OF THE
COMMITTEE ON TRANSPORTATION AND INFRASTRUCTURE

U.S. HOUSE OF REPRESENTATIVES

FEBRUARY 27, 2018

"STATE OF AVIATION SAFETY"

Mr. Chairman and Members of the Subcommittee:

My name is Steve Alterman and I am the President of the Cargo Airline Association, the nationwide organization representing the interests of the all-cargo segment of the aviation community.[1] Thank you for holding this very important hearing on the topic of aviation safety. The all-cargo carrier industry puts safety as a top priority and we appreciate the opportunity to discuss some of the issues we are currently focused on.

The all-cargo carriers, and the customers and airports they serve, are a unique segment of the aviation marketplace. Our member carriers have annual revenues over $100 billion and employ upwards of one million workers worldwide.[2] Customers depend on our services to transport high value, time sensitive, products such as medical devices and perishables, computers and other electronics, and automobile parts. In calendar year 2016, all-cargo carriers operated 89.0% of domestic revenue ton miles (RTMs) and 70.8% of international

[1] Association members include direct air carriers: ABX Air, Atlas Air, Federal Express Corporation, Kalitta Air and United Parcel Service Co., as well as Associate Members: Amazon, Cincinnati/Northern Kentucky International Airport, DHL Express, Memphis International Airport, Louisville International Airport, Ft. Wayne International Airport, John Glenn Columbus International Airport, Spokane International Airport and the Alaska International Airport System.

[2] Survey of Association members.

RTMs.[3] While passenger and cargo airlines fly similar aircraft, takeoff and land from the same airports, and fly over the same cities, they operate entirely different business models with different operational characteristics. Therefore, by recognizing that the all-cargo segment of the air transportation industry is unique, the Federal Aviation Administration (FAA) has correctly determined that in many cases a one-size-fits-all regulatory scheme is not appropriate. This thought was echoed by former Administrator Randy Babbitt at an ALPA Safety Conference when he stated, "In rulemaking, not only does one size not fit all, but it's unsafe to think that it can." When it comes to safety, it is important to consider the differences between cargo and the rest of the aviation industry.

Flight and Duty Time Regulations

One area where somewhat different regulations apply to the all-cargo carriers are the flight and duty time rest regulations. Initially, it should be noted that the safety record of all-cargo pilots in the fatigue area under Part 121 is impeccable and the FAA has determined that these regulations need not be changed for the all-cargo operators. There are several safety-related reasons for this conclusion. For example, all-cargo operations are different in that we provide more and longer flight crew member rest opportunities than passenger counterparts; we have invested the necessary resources to make sure we have the best possible sleep facilities both at cargo hubs and aboard long-range aircraft; we operate without passengers or flight attendants thereby allowing more restful sleep aboard long-range aircraft; and perhaps most significantly, we schedule pilots for an average of 34 hours per month (in the express segment) and 45.5 hours per month (in the heavy freight segment) while passenger carrier pilots fly over 60 hours each month[4].

Looking objectively at safety, operating under the existing Part 121 regulations, the all-cargo industry has operated millions of flights with no fatigue-related accidents attributable to

---

[3] *FAA Aerospace Forecast, 2016-2036*, March 2016.
[4] FAA Initial Supplemental Regulatory Analysis, December 7, 2012.

crew scheduling. Further, in the two accidents where fatigue was listed by the National Transportation Safety Board (NTSB) as the cause or contributing factor, neither of these accidents would have been prevented by the Part 117 rules.

The Federal Aviation Administration (FAA) has on three separate occasions carefully analyzed changing the rest rules and in each case found virtually no benefit in applying the passenger fatigue rules to all-cargo carriers. Additionally, on March 24, 2016, the U.S. Court of Appeals for the District of Columbia denied the Independent Pilots Association's Petition to force the FAA to change the rules, finding that the FAA acted reasonably in its decision to exempt all-cargo pilots from Part 117 passenger pilot rest rules. In denying the IPA's petition, the D.C. Circuit concluded, "Because the FAA adequately and reasonably considered all relevant factors, we also conclude that the FAA's cost-benefit analysis was not arbitrary or capricious".

Pilot Training

With respect to required pilot training issues, the Cargo Airline Association supports the FAA's authority to create additional structured training pathways for credit toward the airline transport pilot certificate (ATP) flight hour requirements. Current language in the Senate version of the Federal Aviation Administration Reauthorization Act of 2017, allows for such pathways and stipulates these additional structured training pathways may only be considered and approved by FAA if they improve safety. Rather than simply requiring 1,500 hours of flying, which may be accomplished by pilots logging flight time in various scenarios that may have little to do with experiences encountered in the commercial world, training flexibility can subject future pilots to fight situations that would not otherwise be encountered by simply flying a required number of hours. Safety would thereby be enhanced by having pilots entering commercial operations better equipped to deal with potential challenging flight operations. Anecdotal evidence already reveals that those meeting the 1,500-hour threshold, but with no other training, are failing initial tests at a rate much higher than before the 1,500-hour requirement was imposed.

To be clear, we are not advocating for a change in the hours required, it simply allows additional pathways to meet the 1,500-hour requirement. The looming pilot shortage cannot simply be ignored and Congress should therefore consider ways to address this problem. In the express cargo environment, where carriers rely heavily on regional feeder operations, we are already encountering situations where there are not enough pilots to fly the feeder aircraft. Large cargo carriers, which depend on hiring pilots from the regional carriers, are looking at their own significant shortages in the next few years. We hope Congress will consider new approaches to addressing the pilot shortage while preserving safety.

The Safe Transport of Lithium Batteries

The all-cargo carrier industry recognizes it is essential to be able to transport lithium batteries and other hazardous materials in the safest manner possible. As a practical matter, all-cargo aircraft operate as part of a global freight network serving hundreds of countries worldwide. In order to transport lithium batteries in the most safe and secure manner, our members rely on harmonized international regulations that allow for their seamless transport across the globe.

Congress recognized the importance of international harmonization when it included Section 828 in the bipartisan FAA Modernization and Reform Act of 2012. The bill ensured U.S. harmonization for the regulation of lithium ion and metal batteries with those regulations set by the ICAO Technical Instructions for the Safe Transportation of Dangerous Goods by Air. Harmonized rules are essential because if different rules were adopted, it would lead to a patchwork of regulatory environments, creating confusion and unnecessary complication in the international marketplace and thereby jeopardize safety. Additionally, shippers who are overburdened with the resulting complexity may attempt to avoid U.S. specific rules by not properly declaring battery shipments or may choose to "go underground" to avoid the rules

entirely. The all-cargo carriers believe that absent Section 828, there could be an effort to issue U.S. specific rules which do not necessarily confront the safety challenges that exist.

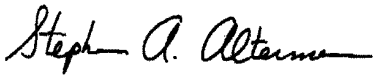
The education of shippers, oversight and enforcement of existing regulations, and focus on counterfeit and undeclared hazardous materials shipments are where we see the most needed attention. Increasing the emphasis on resources given to the DOT for the enforcement of existing regulations against entities who willfully or recklessly flaunt the rules would be something the whole industry may agree on. In certain areas of the world, labeling and packaging of lithium battery shipments are ignored leaving a real threat to aviation safety. The concern exists that counterfeit and non-compliant batteries are entering the supply chain and rarely are these batteries properly declared, while many times they come from unlicensed and unaffiliated manufacturers. Therefore, the U.S. needs a continued focus to emphasize the importance of enforcement for these manufacturers and shippers.

In the U.S., PHMSA is the agency with responsibility for promulgating hazardous materials regulations for all modes and does so with significant and formalized input from the modal agencies such as the FAA, and the general public. PHMSA is uniquely positioned to provide expertise on hazardous materials regulation. Additionally, PHMSA serves as the U.S. representative for the development of the UN Model Regulations on the Transport of Dangerous Goods, which serve as core text that leads to the development of modal regulations like the ICAO Technical Instructions. They are ultimately responsible for incorporating the ICAO standards into national law. PHMSA approaches its participation in ICAO in a similar manner as it does domestically, working closely with the FAA and affected industries to ensure the regulations adopted by ICAO achieve an appropriate safety objective. Given PHMSA's track record at the UN and expertise in both promulgating domestic regulations and incorporating international standards, their participation in ICAO as the lead U.S. representative is appropriate.

Conclusion

The members of the all-cargo air carrier industry continue to make safety their top priority in many cases going above and beyond the basic standards set by the FAA. Thank you for the opportunity to comment and I am happy to answer any further questions.

Respectfully Submitted,



Stephen A. Alterman
President

March 13, 2018

○