BUILDING A 21ST-CENTURY INFRASTRUCTURE FOR AMERICA: STATE OF AMERICAN AVIATION MANUFACTURING

(115–2)

HEARING

BEFORE THE

SUBCOMMITTEE ON
AVIATION

OF THE

COMMITTEE ON
TRANSPORTATION AND
INFRASTRUCTURE
HOUSE OF REPRESENTATIVES

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February 10, 2017

SUMMARY OF SUBJECT MATTER

TO: Members, Subcommittee on Aviation
FROM: Staff, Subcommittee on Aviation
RE: Subcommittee Hearing on "Building a 21st Century Infrastructure for America: State of American Aviation Manufacturing"

PURPOSE

The Subcommittee on Aviation will hold a series of hearings to receive testimony from representatives of different segments of civil aviation in order to help prepare for the Federal Aviation Administration (FAA) reauthorization bill. This memo will serve as the Summary of Subject Matter for these hearings.

The Subcommittee will meet for the first hearing on Wednesday, February 15, 2017, at 10:00 a.m. in 2167 Rayburn House Office Building. The Subcommittee will hear about the current state of civil aviation manufacturing, including the economic, regulatory, and general health of American civil aviation manufacturing, as well as any challenges being faced. The Subcommittee will receive testimony from representatives of the FAA, Boeing Company, Pratt and Whitney, and Textron Aviation.

BACKGROUND

Federal Aviation Administration

The primary mission of the FAA is ensuring aviation safety. The FAA has the responsibility to certify, monitor, and regulate the safety and operation of the civil aviation sector, including airlines, general aviation, unmanned aircraft systems (UAS), airports, commercial space transportation, repair stations, and aircraft manufacturers, as well as to establish licensing and training requirements for pilots and other aviation-related professionals. One of the most visible functions of the FAA is the operation of the air traffic control system. The FAA provides air traffic control services in the continental United States airspace and also vast areas of international airspace over the Gulf of Mexico, Atlantic Ocean, and Pacific Ocean.

On February 14, 2012, President Obama signed into law the *Federal Aviation Administration Modernization and Reform Act of 2012* (FMRA) (P.L. 112-95). This law includes

significant changes to FAA programs and policies. It also provided nearly $16 billion annually from fiscal year 2012 through fiscal year 2015 for FAA programs, projects, and operations.[1]

On July 15, 2016, President Obama signed into law the *FAA Extension, Safety, and Security Act of 2016* (P.L. 114-190). This law extends expiring authorities and taxes included in the FMRA through September 30, 2017. It also authorizes certain critical, time-sensitive safety reforms.

Civil Aviation

The United States civil aviation industry is a major economic driver, contributing roughly $1.6 trillion in total economic activity and supporting roughly 11 million jobs.[2] Our civil aviation system accounts for more than five percent of the U.S. Gross Domestic Product.[3] Air transportation accounts for a significant part by safely and efficiently moving passengers and cargo around the United States and connecting our country to the rest of the world.

This industry supports a diverse and essential aviation system comprised of commercial aviation, general aviation, unmanned aircraft, airports, commercial space transportation, and other users. Commercial and general aviation help transport millions of passengers and move billions in revenue ton-miles of freight safely and securely all across the country. Impacts are also seen state-by-state, where airports and air operators help connect large and small communities, create jobs, and increase economic output.[4]

Manufacturing

Aviation manufacturing is the "seventh leading contributor to national productivity growth."[5] The United States is the home of several major aviation manufacturers, including one of the two major global manufacturers of wide-body aircraft, and a number of the world's major general aviation manufacturers for business jets.[6] While the Nation experienced a severe economic downturn in 2007, civil aviation manufacturing has recovered and has increased its production over the past several years. In 2014, civil aircraft manufacturing's total output was roughly $147.7 billion, an increase from 2012's total output of $122.7 billion. Further, in 2014, general aviation manufacturing's total output was over $29 billion, which was roughly a nine billion dollar increase from 2012.[7]

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[1] The FAA's authorities and taxes authorized in FMRA were extended through March 31, 2016 in P.L. 114-55, and again through July 15, 2016 in P.L. 114-141.
[2] Federal Aviation Administration. "The Economic Impact of Civil Aviation on the U.S. Economy." November 2016. Pg. 3.
[3] Federal Aviation Administration. "The Economic Impact of Civil Aviation on the U.S. Economy." November 2016. Pg. 3. https://www.faa.gov/air_traffic/publications/media/2016-economic-impact-report_FINAL.pdf
[4] Federal Aviation Administration. "General Aviation Airports Reports." http://www.faa.gov/airports/planning_capacity/ga_study/
[5] Federal Aviation Administration. "The Economic Impact of Civil Aviation on the U.S. Economy." November 2016. Pg. 3. https://www.faa.gov/air_traffic/publications/media/2016-economic-impact-report_FINAL.pdf
[6] United States International Trade Commission. "Business Jet Aircraft Industry: Structure and Factors Affecting Competitiveness." April 2012. http://www.usitc.gov/press_room/news_release/2012/er0530kk2.htm
[7] Federal Aviation Administration. "The Economic Impact of Civil Aviation on the U.S. Economy." November 2016, p. 28.

While American aviation manufacturing has continued to grow, the industry has also faced a number of global and domestic challenges. In the United States, the FAA is responsible for developing certification standards to ensure the safety of design and production of aircraft, aircraft components, and other avionics. To meet this responsibility, the FAA has a system of processes and compliance reviews that certify the design and production of aircraft and aircraft components to specific safety standards. However, these processes can often be lengthy and costly for aviation manufacturers.[8] FMRA directed the FAA to find ways to improve and streamline certification processes, reduce delays, and harmonize regulatory standards both domestically and internationally.[9] As a result of this mandate, working groups consisting of industry, FAA, and labor representatives made a number of recommendations to streamline aircraft certifications and address inconsistent regulatory interpretations across the Agency.

Airports

The United States has over 19,400 airports providing important services to our aviation system, and in many communities, they are key economic drivers. The current National Plan of Integrated Airport Systems (NPIAS) identifies 3,332 commercial service and general aviation airports that are significant to national air transportation and thus eligible to receive federal grants under the Airport Improvement Program (AIP). It also includes estimates of the amount of funding needed to complete infrastructure development projects bringing these airports up to current design standards and adding capacity at congested airports.[10] The current NPIAS estimates there are $32.5 billion in AIP-eligible projects between 2017 and 2021.

There are 382 airports in the NPIAS classified as primary airports because they support scheduled commercial air service at a certain volume, and 2,950 non-primary airports supporting low-level commercial service and general aviation operations.[11]

Airport Revenue

To finance daily operations, airports generate and rely on both aeronautical and non-aeronautical revenue. The primary sources of aeronautical (or airside) revenue are various fees paid by airlines and other airport users for the lease of terminal space, landing fees, and use of other airport facilities, such as jet bridges. Non-aeronautical (or landside) revenue sources include airport terminal concessions, parking, rental car operations, and rental fees.

Airport Capital

To finance capital needs, airports use a combination of federal grants, federally-authorized local airport charges, state and local grants, and airport revenues.[12] The primary

[8] 14 C.F.R Parts 21, 23, and 25.
[9] Sections 312 and 313 of the *FAA Modernization and Reform Act of 2012.* (P.L. 112-95.)
[10] Federal Aviation Administration. "National Plan of Integrated Airport Systems (NPIAS)" http://www.faa.gov/airports/planning_capacity/npias/
[11] *Id.* at 4.
[12] Tang, Rachel Y., Kirk, Robert S., "Financing Airports Improvements", Congressional Research Service. December 4, 2013.

Federal grant program funding for airport development and planning is the AIP. AIP funds are primarily used for improvements related to enhancing airport safety, capacity, security, and environmental concerns. Airport sponsors can also use AIP funds, in most cases, on airfield capital improvements or repairs and, in some specific situations, for terminals and hangars. The AIP is currently authorized at $3.35 billion.

Because the AIP does not cover all airport capital needs, Congress has authorized airports to collect a fee on passengers called the passenger facility charge (PFC). A PFC is approved by the federal government, collected by the airlines, and paid directly to the airport without going through the federal Treasury. The PFC is intended to supplement, not replace, AIP funds. Airports can use PFCs to build critical infrastructure projects at their facilities. However, unlike AIP funds, airports can use PFC revenue for gates, airline ticket areas, and debt service on bonds that airports issue to finance airport infrastructure projects. In 2016, the FAA estimated that airports collected approximately $3.1 billion from PFCs.

Civil Aviation Operators

Airlines and Charters

The air transportation industry includes major airlines, regional airlines, all-cargo airlines, and charter operators that serve the widely varying needs of American consumers and businesses.

In 2015, approximately 2 million passengers flew on domestic and international flights operated by U.S. airlines each day.[13] Foreign carriers serving the United States carried additional passengers to and from the United States. The transportation of air freight is also substantial: in 2014, over 64 billion ton-miles of freight passed through U.S. airports.[14] Charter operators are a diverse group of approximately 2,000 companies operating over 10,000 aircraft of various sizes and types serving the largest cities and also rural communities lacking scheduled service.[15] In addition to direct economic impacts, air transportation enables substantial economic activity outside of the transportation sector.

In recent years, the U.S. airline industry has shown sustained profitability. However, this stability comes after decades of financial volatility that resulted in mergers and acquisitions, the disappearance of some airlines, and the emergence of others. Major U.S. passenger airlines often partner with other airlines to complement their services. Domestically, they partner with regional airlines operating smaller aircraft to fly routes or during times-of-day that cannot be economically served with other, larger aircraft. Internationally, they also form alliances with foreign airlines to mutually expand their reach of their global networks. U.S. all-cargo airlines are part of larger integrated logistics companies that operate hubs around the U.S. and the globe.

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[13] Bureau of Transportation Statistics. "2015 U.S.-Based Airline Traffic Data." https://www.rita.dot.gov/bts/press_releases/bts018_16

[14] Federal Aviation Administration. "The Economic Impact of Civil Aviation on the U.S. Economy." Pg. 4. https://www.faa.gov/air_traffic/publications/media/2016-economic-impact-report_FINAL.pdf

[15] Study of Operators Regulated Under Part 135, April 2016. Available at: http://nata.aero/data/files/gia/4656_001.pdf (p. ES-2)

The FAA conducts comprehensive safety oversight of the airline industry. In 1978, the *Airline Deregulation Act of 1978* (ADA) eliminated most economic regulation of the industry in favor of allowing market forces to determine domestic airfares, routes, and levels of service. The legislation included the Essential Air Service program to protect air service in smaller communities. Since enactment of the ADA, airfares have fallen dramatically in real terms.[16] In 1992, the United States entered into its first "Open Skies" agreement which eliminated most governmental limits on international services. Since that time, the United States has entered Open Skies agreements with 100 countries around the world.[17]

General Aviation

The general aviation segment consists of flight activity for personal and business use. This activity includes recreational aviation, flight training, and other private uses. Aircraft used in general aviation range from helicopters and piston-engine aircraft to large transport aircraft capable of intercontinental flight.

According to the FAA, "...the long term outlook for general aviation is favorable, led by gains in turbine aircraft activity. While steady growth in both GDP and corporate profits results in continued growth of the turbine and rotorcraft fleets, the largest segment of the fleet–fixed wing piston aircraft—continues to shrink over the forecast."[18] In addition, FAA forecasts that "...the number of active general aviation pilots (excluding ATPs) is projected to decrease about 5,000 (down 0.1 percent yearly)..." between 2016 - 2036.[19]

New Aviation Technologies and New Operators

Air Traffic Control Modernization or "NextGen"

In order to meet anticipated growth in air traffic, Congress directed FAA to undertake a series of initiatives to revamp the Nation's Air Traffic Control System known as "NextGen". The goal of NextGen is to transition from ground-based navigation and surveillance systems to a satellite-based system in order to increase the efficiency, capacity, and flexibility of our airspace. Specifically, NextGen initiatives should reduce the required separation between aircraft, result in more efficient routes, and decrease congestion. Together, these initiatives should provide a better experience for the travelling public.[20] NextGen consists of specific programs to realize these benefits, including Automatic Dependent Surveillance-Broadcast (ADS-B), System-Wide Information Management (SWIM), and Data Communications (Data Comm). The goal at the

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[16] Thompson, Derek. "How Airline Ticket Prices Fell 50% in 30 Years (and Why Nobody Noticed)." The Atlantic. Feb. 23, 2013. http://www.theatlantic.com/business/archive/2013/02/how-airline-ticket-prices-fell-50-in-30-years-and-why-nobody-noticed/273506/

[17] U.S. Department of State. "Open Skies Agreements." https://www.state.gov/e/eb/tra/ata/

[18] FAA Aerospace Forecast, 2016-2036, p. 2.

[19] *Id.* at 25.

[20] GAO "*Next Generation Air Transportation System: Information on Expenditures, Schedule, and Cost Estimates, Fiscal Years 2004-2030,*" November 17, 2016, p. 1.

inception of NextGen was to achieve transformation of our National Airspace System (NAS) by 2025.[21]

According to a Government Accountability Office (GAO) report, FAA has spent approximately $7.4 billion on programs identified as NextGen.[22] In order to ensure timely completion, FMRA established a Chief NextGen Officer within the FAA to oversee the implementation and management of NextGen and created NextGen metrics. However, the NextGen programs have been consistently fraught with delays and cost-overruns. According to a November 2016 GAO report, six NextGen activities with completion dates in 2025 have been delayed to 2030.[23] According to Inspector General of the Department of Transportation (DOT IG) Calvin Scovel during the February 5, 2014 hearing entitled *"The FAA Modernization and Reform Act of 2012: Two Years Later"*, the total expenditures of NextGen look to be two to three times greater than the initial $40 billion estimate.[24]

Remote Air Traffic Control Towers

Technology could enable some airports to provide air traffic services remotely. Remote air traffic control towers include cameras, microphones, meteorological sensors, and other monitoring equipment installed at the airport. Controllers are located at facilities that receive real-time data and video from these sensors and equipment. A controller at the remote location operates traffic at the airport the same way he or she would in a normal tower. This technology was tested at Leesburg Airport in Virginia in 2015. This technology could provide air traffic services to airports located in rural and remote areas, thereby greatly improving safety and increasing access to the NAS.

Unmanned Aircraft Systems

UAS, or drones, are an important innovation in aviation technology. There is significant demand for UAS in the United States. From 2005-2014, the number of countries using UAS for commercial and military purposes nearly doubled.[25] Since the early 1990s, UAS have operated in the national airspace mostly in support of governmental functions, such as military and border security operations.[26] In recent years, the private sector has developed a sweeping range of uses for UAS including aerial photography, surveying, agriculture, communications, environmental monitoring, and infrastructure inspection.[27] Certain companies have announced plans for small package delivery using UAS.

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[21] *Id.* at 3
[22] *Id.* at 2
[23] *Id.* at 2
[24] GAO *"The FAA Modernization and Reform Act of 2012: Two Years Later"* Hearing before the Subcommittee on Aviation – Hearing Transcript, February 5, 2014, p. 22.
[25] GAO *"Key Issues: Unmanned Aerial Systems (Drones),"* February 1, 2016 http://www.gao.gov/key_issues/unmanned_aerial_systems/issue_summary
[26] Federal Aviation Administration, "Integration of Civil Unmanned Aircraft Systems (UAS) in the National Airspace System (NAS) Roadmap" https://www.faa.gov/uas/media/UAS_Roadmap_2013.pdf (p. 4)
[27] *Id.* at 6

The emergence of UAS offers substantial opportunities and also raises important policy issues such airspace rules, privacy concerns, and aviation safety. Since 2014, the FAA has promulgated regulations authorizing use of small UAS on a routine basis, requiring registration of certain UAS, and has also authorized use of certain advanced technologies through waivers and other regulatory means.

Commercial Space Transportation

For decades, private industry, with the support of National Aeronautics and Space Administration (NASA) and the FAA, have worked to develop new and innovative methods to transport passengers and cargo safely and efficiently into space. Under the *Commercial Space Launch Act of 1984* and subsequent amendments, the Secretary of Transportation has the responsibility and authority to facilitate, regulate, and promote the commercial space transportation industry. This responsibility has been assigned to the FAA's Office of Commercial Space Transportation (AST). According to the FAA, the AST's mission "is to ensure protection of the public, property, and the national security and foreign policy interests of the United States during commercial launch or reentry activities, and to encourage, facilitate, and promote U.S. commercial space transportation."

AST issues launch and reentry licenses for commercial space launches, permits for experimental launches, and launch site licenses for commercial spaceports. AST licensed 11 commercial launches, permitted four experimental launches, and supervised 10 active spaceport licenses in 2016. As the pace and complexity of commercial space transportation operations continues to increase, AST's role in regulating and facilitating the industry will continue to evolve.

Other issues.

In addition to the issues discussed above, the hearings may also touch on the following subjects:

- *Safety Oversight*: The U.S. commercial aviation system has an impressive safety record, but accidents, including the crash of Colgan Flight 3407, the disappearance of Indonesia AirAsia Flight 8501 and the intentional crashing of Germanwings Flight 9525, are stark reminders to be ever vigilant. Aviation safety is reliant on excellent training, the sharing of safety critical data and information, and strong oversight.

- *Essential Air Service (EAS) program*: The EAS program was created in 1978 to ensure continuity of air service to small communities following enactment of the ADA. The program provides subsidies to airlines to provide service to small communities where there are not enough passengers to operate profitably. Recent Congresses have enacted reforms limiting program participation and subsidy levels.

- *FAA Contract Tower Program*: Federal contractors provide air traffic control services at visual flight rule airports. FAA oversees the safe operation of these towers. As of February 2016, there are 252 contract towers in the NAS.

- *Cybersecurity:* As aviation has evolved and newer technologies have been adopted and integrated cybersecurity concerns have arisen. In July 2016, the President signed into law the *FAA Extension, Safety and Security Act of 2016* that directed the FAA to implement a strategic framework for cybersecurity.

WITNESSES

Ms. Peggy Gilligan
Associate Administrator for Aviation Safety
Federal Aviation Administration
(Accompanied by: Ms. Dorenda Baker,
Director, Aircraft Certification Service, FAA)

Dr. Alan Epstein
Vice President, Technology and Environment
Pratt and Whitney

Mr. John Hamilton
Vice President, Engineering
Boeing Commercial Airplanes

Mr. Michael Thacker
Senior Vice President for Certification
Textron Aviation

BUILDING A 21ST-CENTURY INFRASTRUCTURE FOR AMERICA: STATE OF AMERICAN AVIATION MANUFACTURING

WEDNESDAY, FEBRUARY 15, 2017

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 please come to order. Thank you all for being here. I would like to ask unanimous consent that Members that are not on the subcommittee be permitted to sit with the subcommittee at today's hearing and ask questions.

OK, without objection, so ordered.

Before I begin my statement, I would like to take a moment to recognize that February 12th was the eighth anniversary of the tragic crash of the Colgan flight 3407 that claimed the lives of 50 people. This anniversary is a vivid reminder to all of us that ensuring safety of our aviation system is and will continue to be our top priority. I want to thank the Colgan family members for their continued dedication and involvement and advocacy.

Today the Aviation Subcommittee will hold its first hearing of the 115th session of Congress. This hearing is also the first in a series of hearings to prepare for the FAA reauthorization bill. This Congress, the Transportation and Infrastructure Committee is looking to the future and how we build a 21st-century infrastructure for America. With this in mind, today the subcommittee will discuss the state of aviation manufacturing, the challenges it faces, where it is heading in the 21st century, and how we ensure the continued success of this segment of the aviation infrastructure.

Aviation manufacturing is a critical sector of our Nation's economy that contributes billions of dollars and supports millions of good-paying American jobs. The United States has always been the gold standard in aviation safety, as well as the leader in aviation manufacturing. U.S. civil aircraft manufacturing is a top net exporter, with U.S. aviation goods being delivered throughout the world. However, recently, global competition, as well as redundant, outdated, and inefficient rules and regulatory processes have jeopardized that lead.

The FAA plays an important role in ensuring that all aircraft and aircraft components made in the United States meet specific design and production safety standards. This role is absolutely critical to ensure that safety is never compromised. It is the FAA Tech Center in my district in South Jersey that all certification research is performed. The Tech Center is finding more and more ways to improve airport designs and procedures, as well as develop fire suppression capabilities for aircraft.

Yet, the certification process has its problems. As manufacturers design and build to meet those standards, they can experience needless and harmful bureaucratic delays, both internationally and domestically. These delays can be very detrimental to U.S. manufacturers trying to compete globally where every day of delay can mean real losses in both profits and jobs.

As the aviation industry expands its international reach, and introduces new technologies and innovations, it is critical the FAA certification and regulatory process adapt and respond. The FAA must leverage the expertise of the private sector and fully utilize all of the authorities it has been granted. Enabling our aviation manufacturers to enter new markets and innovate, while ensuring the highest level of safety, is a top priority of this subcommittee.

Today I look forward to hearing our witnesses' viewpoints on the state of American aviation manufacturing and where they believe it is headed in the 21st century. I also want to hear their suggestions on what role the Government can play to support the aviation manufacturing industry's continued success. I thank all of the witnesses for joining us today.

And finally, I would like to take the opportunity to thank Ms. Peggy Gilligan for her years of service. As many of you know, this will be Peggy's last hearing, testifying before our subcommittee. Peggy began her career with the FAA in 1980, and this spring, after 37 years of dedicated service, she will be retiring.

I would like to thank you for your dedicated service and all that you have contributed to the FAA and aviation.

Before I recognize my colleague, Mr. Larsen, for his comments, I would like to ask unanimous consent that all Members have 5 legislative days to revise and extend their remarks and include extraneous material for the record of this hearing.

Without objection, so ordered.

And now I would like to yield to Mr. Larsen.

Mr. LARSEN. Thank you, Chairman LoBiondo, for calling today's hearing on the state of American aviation manufacturing.

The U.S. aviation industry is an economic powerhouse. In 2014 civil aircraft manufacturing in the U.S. generated a total output of more than $143 billion, an increase of more than $20 billion since 2012. This number does not account for the tens of billions of dollars in output from engine and aircraft parts manufacturing, and this topic naturally hits close to home for me.

According to the State of Washington in 2014, the aerospace industry generated over $85 billion in economic activity throughout the State. More than 1,300 Washington aerospace businesses support more than 260,000 jobs and travel for billions of passengers each year. These companies range from Boeing, whom this panel will hear from today, to the many small businesses that are a crit-

ical part of the aviation supply chain, and there is some discussion going on in Lynnwood, Washington, today, in my district, at the Pacific Northwest Aerospace Alliance conference on these very issues.

In 2014, 95 percent of all commercial airplanes produced in North America were manufactured in and took their maiden flights from Washington State. So, needless to say, manufacturing and certification are critical to my home State, but many Members here today have a robust aviation manufacturing presence in their districts.

The issues we explore this morning have been explored before by this panel, and I thank Chairman LoBiondo for remaining focused on them. Without question, the predictable and timely certification of aircraft and aircraft components is critical for domestic manufacturers to get their products to market.

I look forward to hearing from all of the witnesses about what difficulties U.S. manufacturers face, what the FAA and this subcommittee can do to make the agency's certification process more consistent and efficient, while providing nothing less than the highest level of safety.

To that end, I understand the FAA's certification workload is constantly growing, while the size of its inspection workforce is not. The FAA needs adequate staffing resources to do the job and keep pace with new demands and new technologies. This is one reason the FAA's Organization Designation Authorization program, or ODA, is critical to making the certification process more efficient. So I look forward today to hearing about ODA, how the program could be better used, and the FAA's recent efforts in this area.

A common theme I hear during conversations with manufacturers as well is they're competing in an increasingly crowded global market. Chairman LoBiondo and I asked the Government Accountability Office to explore the FAA's certification process in the U.S. as it compares with those of its counterparts around the world. The resulting 2015 report highlighted many of the challenges in getting products certified and to market. The FAA's product certification is and must remain the gold standard abroad, so that U.S. manufacturers remain competitive. So I look forward to hearing about the progress in that area, specifically.

Last year the committee had been moving forward towards passage of a long-term FAA reauthorization. Bipartisan compromise and significant industry input produced an entire certification reform title in the bill, the AIRR Act, that would have brought long overdue changes to the FAA's certification process. Certification, improved grant and safety programs, established rules of the road for unmanned aircraft systems, and boosted consumer protection are not back-burner aviation issues; they are front-burner aviation issues. And the next FAA reauthorization should be a long-term bill, a comprehensive bill, and address the issues on today's agenda.

Chairman LoBiondo, before hearing from our witnesses, I too would like to extend my gratitude to Peggy. We will lose a visionary leader, a tireless advocate for aviation safety when Peggy Gilligan retires. But after 37 years, she has earned it.

Your exceptional service and unwavering dedication to the agency and the public is inspiring, and I thank you very much. I am sure I speak on behalf of my colleagues, as well, when I say you will be missed.

So thank you, Mr. Chairman. I look forward today to hearing from our witnesses.

Mr. LOBIONDO. Thank you, Rick. I would like to recognize Chairman Shuster for any opening remarks.

Mr. SHUSTER. Thank you, Mr. Chairman. Thank you for having this hearing today. I appreciate you and Ranking Member Larsen for putting this together.

I just want to start off by just echoing what my colleagues have said about Ms. Gilligan. Her upcoming retirement is well deserved. We appreciate the service that you have given the Nation, and look forward to—hopefully you are not going to stay out too long, you will figure out some way to reengage with all the knowledge that you have and we certainly can utilize. So thank you very much for that.

I look forward to today's discussion, to hear from the FAA, but also the manufacturers, and find out what is going on in their world and learning. I understand that a few of you have some pretty good ideas, some strong ideas, based on experience, that work. So we look forward to hearing that.

We are—this is the first in a series of hearings talking about aviation and we in Congress can work with the industry to build a 21st-century aviation system.

Aviation manufacturing, which was mentioned, I'm not going to go through the numbers—we heard it, we know it, it is incredibly important to the United States of America, the manufacturing of aviation in this country. And I will say we have a President in the White House that is committed to making sure that manufacturing in this country is strong and viable.

And also, it is probably the first time we have had a President that has used the airspace more than anybody else coming into office. He owns a plane, he knows—he is in the air constantly. Quite frankly, I think he probably uses an airplane like most of us use an automobile to get around. And so we have got somebody that, again, really understands, and understands the need to make sure that, if we are manufacturing, how we have to streamline these agencies and Government to help the manufacturers move forward.

And again, we have had longstanding leadership in aviation. In fact, everyone knows we invented it. We need to maintain that lead. And one of the reasons we have been able to maintain that lead is because of our high level of safety, the current safety, and all of our manufacturers sitting at the table, I know they are committed to safety. If they weren't, they probably wouldn't have businesses, because their business is driven by safety. They have got to have the safest product out there, because we depend on it when we are using those products.

So again, I look forward to talking about those types of things. And again, it is important that, as we move forward, that the Government agency that oversees this, that regulates it, is just as innovative as our industries have been, moving forward with new programs to, again, make sure safety is job number one, but that

we are out there making sure that our manufacturers aren't looking to other countries.

And I have heard the stories about, you know, when you hear countries across the world that move—industries move faster than ours, when it is—when you hear it is maybe Brazil or Canada or China, you think, well, OK. But I have heard the stories the Europeans move faster than we do when it comes to moving these air frames and these avionics forward. And if the Europeans are moving faster than we are, we are really threatened, I believe.

We are threatened by what other countries are doing, but when Europe does it we have really got to stand up and pay attention and make sure we are doing the right thing, because I don't want to see the aviation industry go the way of electronics, autos, textiles, and steel. As I said, this is so important to the Nation, and we need to be committed to making sure we have the best oversight that we can have to ensure safety, but also moving forward with manufacturers to continue to maintain our lead in the world when it comes to aviation.

So again, I look forward to the discussion, and thank you all for being here. Thank you for giving us your time today. And I yield back.

Mr. LOBIONDO. Thank you, Mr. Shuster.

Mr. DeFazio?

Mr. DEFAZIO. Thank you, Mr. Chairman. I think it was just about 2 years ago today that you convened a hearing on this same topic, as we were approaching FAA reauthorization. In the end, we came to a bipartisan consensus on what we need to do to reform certification. And I would hope that we can reach that same point again very quickly this year. It was the other issues in the bill that precluded the adoption of a longer term authorization. And hopefully we can do that this year.

We did adopt at least one change. I had heard from a number of people, particularly dealing with the Chinese aviation authority, that our manufacturers are over there without FAA representation. So, essentially, a company dealing with the Government, as opposed to a Government-to-Government supporting our companies. And I got a provision included to allow the FAA to accept reimbursements. Unfortunately, it seems that the FAA has been unable to figure out a way to accept reimbursements, which should take about 10 minutes. So I will be asking about that today. I really want to see that move forward, and I want to help rein in the abuses of the Chinese and others.

Another concern is the charges that are levied. The EASA [European Aviation Safety Agency], you know, to—just to revalidate an FAA-issued certificate, charges about 95 percent of what they would charge for a manufacturer to bring in a new product and go through their full certification. That seems unreasonable. And I think it would be critical that, in this long-term bill, that we put in provisions for reciprocity. That is, if the Europeans want to do that to our manufacturers, then we are going to do it to their manufacturers for the same price. And then perhaps we can bring them to the table and get more reasonable.

And then, just—not to engage in the debate over the privatization of air traffic, but, you know, that is what caused these provi-

sions to stall last year. And I would observe that certification is, when the industry is polled broadly, the number-one issue. And reforming it is one thing, but it is going to—in the proposal that passed this committee last time—it is going to be left over—subject to the vicissitudes of the appropriators, and sequestration, and all the other problems that we have had. While over here we would have the ATO [Air Traffic Organization], but yet the ATO can't move forward without the certification.

So, I think sundering the agency is problematic when the certification is recognized by so many as the number-one problem we have today with the FAA.

And, like everyone else, I would like to thank Peggy Gilligan, a lifetime of work. And, you know, I guess this is probably the last time we will have you here formally, but I wish you well in a well- and hard-earned retirement. And your legacy is that, you know, you have been a warrior for safety, and the industry has the best safety record during your tenure as the chief safety officer of any time in the history of the United States. And I think a lot of people can thank you for that. You kept them safe.

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

Mr. LOBIONDO. Thank you, Mr. DeFazio. Now we will turn to our first panel.

First is Ms. Peggy Gilligan, Associate Administrator for Aviation Safety for the FAA, who is accompanied by Ms. Dorenda Baker, Director of the Aircraft Certification Service for the FAA.

Mr. John Hamilton, vice president of engineering for Boeing Commercial Airplanes.

Mr. Michael Thacker, senior vice president of engineering for Textron Aviation.

And at this time I would like to recognize Representative Esty to introduce one of our witnesses that is from her home State of Connecticut.

Ms. Esty?

Ms. ESTY. Thank you, Chairman LoBiondo and Ranking Member Larsen, for inviting me to participate in today's hearing. I am delighted to have the opportunity to introduce our final panelist, actually, who is in the middle of the table, Dr. Alan Epstein from Pratt & Whitney in my home State of Connecticut. And he is vice president of technology and environment. He is responsible for coordinating technology across all of Pratt & Whitney, and has a distinguished career at MIT, my father and grandfather's alma mater, and we are delighted for your leadership and your insight to help us guide important decisionmaking in this committee to have robust and safe aircraft in the United States and across America.

Thank you very much for joining us. We are very proud of your work.

Mr. LOBIONDO. Thank you, Congresswoman Esty.

Ms. Gilligan, you are recognized for a statement.

TESTIMONY OF MARGARET GILLIGAN, ASSOCIATE ADMINISTRATOR FOR AVIATION SAFETY, FEDERAL AVIATION ADMINISTRATION, ACCOMPANIED BY DORENDA BAKER, DIRECTOR, AIRCRAFT CERTIFICATION SERVICE, FAA; ALAN H. EPSTEIN, PH.D., VICE PRESIDENT OF TECHNOLOGY AND ENVIRONMENT, PRATT & WHITNEY; JOHN HAMILTON, VICE PRESIDENT OF ENGINEERING, BOEING COMMERCIAL AIRPLANES; AND MICHAEL THACKER, SENIOR VICE PRESIDENT OF ENGINEERING, TEXTRON AVIATION

Ms. GILLIGAN. Thank you, Mr. Chairman and Chairman Shuster, as well as Ranking Member Larsen and Mr. DeFazio.

First, let me thank you for those very kind words. I am very proud of the FAA's accomplishments during my tenure. And I want to thank this committee for the strong support you have provided to us for all of those efforts. And I would also like to thank you for all the opportunities I have had to appear before you over the years. Some of those have been very difficult, challenging hearings. This one, I am pleased to say, I think will be a very positive hearing, where we and our industry can share what we are doing to continue to build this industry and support the American economy.

I can tell all of you that the state of American aviation manufacturing is strong. The FAA is proud to partner with industry to find ways to make it even stronger, and to support innovation. Civil aviation manufacturing is the strongest trade sector for net exports at $60 billion. And, as the chairman and others noted, the manufacturing sector supports 1.5 million jobs in the U.S. economy, and contributes $165 billion to the GDP.

But from my perspective, more importantly, it contributes to our outstanding aviation safety record, where we have seen no passenger fatalities in U.S. airline operations for more than 8 years. This accomplishment, our outstanding safety record, is not the result of luck or happenstance. It is the result of FAA, manufacturers, operators, and aviation labor, working together to establish sound safety standards and practices.

And the bedrock of this achievement, the bedrock of our safety record, is the FAA's certification process itself, which assures the American public and Congress that our manufacturers are meeting our safety standards. This committee has asked FAA to improve the process for certifying aviation products, and I am pleased to share with you what we have accomplished.

You wanted performance objectives and metrics. We have developed a joint industry-agency certification scorecard. The sample scorecard that you have in front of you has three sections. At the bottom we track the manufacturer's noncompliance with standards and the implementation of corrective actions to assure us and them that everything is being done properly.

In the middle, we measure how well FAA is optimizing delegation, based on the company's capabilities. And at the top, we actually rate each other's performance. This serves as a tool to have open communication between the manufacturer and the FAA office to assure that we are each held accountable to meet our responsibilities.

You wanted us to delegate more responsibility to manufacturers. The scorecard shows that we're doing that. Eighty-four companies

hold Organization Designation Authorizations, or ODA. And according to the GAO, FAA designees perform more than 90 percent of certification activities. That means FAA is optimizing our involvement and holding manufacturers accountable to their capabilities. And the industry has been clear with us; they appreciate our efforts in this area.

But we also know that, to respond to new business models and innovation like additive manufacturing or electric propulsion, we need to be agile. And that is why we are transforming the aircraft certification service. And I have provided more details on that transformation in our written testimony.

You wanted a process to resolve disputes that slow certification. Based on industry recommendations, we developed a regulatory consistency communication board that allows for unresolved issues to be addressed in a timely fashion by a team of safety and legal experts.

You wanted us to provide support when our manufacturers sell products overseas. Starting with Europe and Canada, we have agreed to accept each other's approvals of repairs, of parts, and of basic aftermarket modifications, with no further technical review. We intend to extend this approach to Brazil.

We are also working with other national aviation authorities in countries that do considerable business with our U.S. manufacturers. For example, just last week Ms. Baker was in China, working with her counterpart, to expand and improve the use of our bilateral agreement. The prompt validation of U.S.-designed aircraft like the 737 MAX, is our top priority in working with China. And the more our international partners can rely on FAA certification, the more efficient it will be for U.S. manufacturers.

You wanted us to make it easier for the GA fleet to get safety equipment in the cockpit. First we enabled the installation of angle-of-attack indicators to address loss of control, the leading cause of fatalities in general aviation. We built on that experience and issued policy for installing other nonrequired safety-enhancing equipment. And we are beginning a prototype program that streamlines production requirements for more modern equipment.

And, most importantly, with the strong support of this committee, we issued a new set of design standards for general aviation aircraft: the rewrite of part 23. This rule will allow innovation and efficiency in GA aircraft design and manufacture, while assuring the right level of safety.

We have made tremendous progress, but there is more to do. And just last week we kicked off a committee with industry to foster collaboration in an open and transparent manner. We committed to develop a blueprint to establish shared objectives and priorities. This will allow FAA to meet future needs and ensure that aviation manufacturers remain competitive in the global marketplace.

Thank you again for this opportunity and for the many opportunities throughout my career, and I am happy to answer your questions.

Mr. LOBIONDO. Thank you, Ms. Gilligan, very much. Dr. Epstein, you are recognized for your statement.

Dr. EPSTEIN. Thank you, Mr. LoBiondo and members of the subcommittee. I am Alan Epstein, vice president of technology and en-

vironment at Pratt & Whitney. And our dependable engines have powered aircraft for over 90 years, with over 75,000 now in the field.

Pratt is part of the United Technologies Corporation, a global enterprise with a long history of pioneering innovation in aviation and building systems. As noted, aerospace is America's largest manufacturing export. I make the number at $80 billion a year. It seems to be an elusive number.

While marquee aircraft make up about half of this total, famous names like Boeing and Cessna, the export of aircraft components such as engines and cells and landing gear are of equal value. Indeed, much of the component content of the world's civil aircraft is American, even if the airplanes carry the name of European, Brazilian, or Chinese manufacturers.

And of course, American aviation manufacturing is about more than just dollars. It is about the 1.7 million Americans who are employed at this industry.

The most recent surge in aircraft orders has a lot to do with Pratt & Whitney's geared turbofan engine. The GTF and the competitive responses resulted in orders valued at almost $800 billion. This success stems from the GTF's dramatic reduction in fuel burn and noise.

For example, when the new aircraft take off from La Guardia Airport, about half a million fewer people will be impacted by noise. This success means that Pratt will be doubling production over the next few years.

Part of this growth depends upon manufacturing innovation, bringing moving engine assembly lines to Connecticut and Florida, cryogenic machining to Maine, advanced coatings to New York, hybrid airfoils to Michigan, and additive manufacture to Georgia. You need the best people to make the best products. Pratt plans to hire 25,000 people over the next decade. To foster 21st-century skills on the factory floor, we support community colleges in many States, including Connecticut, Maine, New York, Georgia, Michigan, Texas, and Florida.

The strength and experience of the FAA is an important competitive advantage for U.S. industry. FAA production certification is required for new manufacturing technologies and new suppliers. As part of our expansion, Pratt has worked with the FAA to gain production certification at new engine assembly sites, and approval of new suppliers. Partnering with the FAA through the organizational designated authority system has proven extremely helpful. ODA for manufacturing approval works, and it works well.

The FAA must continue to progress in the delegation of responsibilities to certificate holders. Pratt strongly supports the actions already deployed under the FAA accountability framework initiative, and looks forward to teaming on air transformation.

As Benjamin Franklin said, "an investment in knowledge pays the best interest." We work with the FAA on advanced technologies to reduce fuel burn, emissions, and aircraft noise: notably, the FAA's CLEEN [Continuous Lower Energy, Emissions, and Noise] program. Recently, the FAA has been proactive in exploring the certification implications of new technology such as additives manufacture.

One industry concern is the aging certification workforce. A lot of talent will be retiring in the next few years, and to provide the support U.S. industry needs, the FAA must be properly funded and authorized to hire and train replacements. A strong, competent, flexible FAA is an important enabler for U.S. industry.

Competition is fierce. Other nations have been ramping up Government civil aeronautics investment as the U.S. has dropped its own. U.S. research down by 40 percent, the EU up by a factor of 10. China, the newest entrant, has announced large investments in civil aviation, both for airplanes and, most recently, billions for engines.

U.S. aviation manufacturing is alive and well. The Federal role is critical to America's largest manufacturing export industry. We must continue to nurture the public-private partnership that has served this country so well. Thank you.

Mr. LOBIONDO. Thank you, Dr. Epstein.

Mr. Hamilton?

Mr. HAMILTON. Good morning. Chairman LoBiondo, Ranking Member Larsen, members of the committee, thank you for this opportunity to provide Boeing's perspective on the state of commercial aerospace manufacturing and the policy changes facing our business.

I am John Hamilton, vice president of engineering for Boeing Commercial Airplanes, and I am proud to be here today to represent the 148,000 Boeing employees who design, build, and certify the best aerospace products in the world.

First I commend the committee for the bipartisan reform included in the FAA reauthorization. We appreciate the bold vision of this committee and the continued focus on ensuring the strength of domestic aerospace manufacturing.

For context it is important to note Boeing's place in the U.S. and world economy. Boeing remains the Nation's largest exporter, exporting $56.8 billion of products and services in 2016. Last year we delivered 748 commercial airplanes, with 80 percent of those overseas. We assemble all of our aircraft in the United States, and we are proud that 80 percent of our company's suppliers are here in the United States.

Annually, we spend roughly $50 billion in the U.S., far more than any other company that produces large, commercial aircraft. We are proud to sell American-made products to all corners of the globe, which is why we have long supported trade policies and trade agreements that open markets, facilitate the movement of goods across borders, and level the international playing field.

More than 90 percent of our workforce is based in the United States, along with 1.5 million jobs throughout the supply chain. The biggest markets for our products over the next 20 years are in Asia and the Middle East. And we need Congress and the new administration, including the FAA, to support our efforts to win in these markets. Tens of thousands of U.S. jobs in our industry are at stake.

The FAA's role in this global competition is critical. Every new Boeing airplane, type-certified by the FAA, must be validated by its foreign regulatory counterpart in every country for which we export a product. This process is not meant to be a recertification. A vali-

dation should be just that, validating that the FAA conducted the type certificate work to the standards of the foreign regulatory authority in question. This process should be quick and efficient. But in some cases it can take upwards of 14 months.

For example, 83 different customers from 43 countries have ordered our newest product offering, the 737 MAX. The FAA and Boeing must work with each foreign regulatory authority to get approval to deliver our aircraft to those customers. This is a time-consuming task and requires FAA resources and, more importantly, a strong working relationship between the FAA and foreign regulators.

The FAA aircraft certification service cannot efficiently complete these critical validation activities without resources and support from Congress and the prioritization and focus from FAA's senior leadership. This work cannot be viewed as secondary or a lower priority function at the FAA. It is a critical priority for Boeing and all U.S. aerospace exporters. Congress must continue to support and prioritize these efforts.

With respect to our day-to-day interactions with the FAA on certification activities, we have seen progress in efforts to streamline the process, and hope that, with continued partnership, we will see continued progress.

The FAA has embarked on an effort known as air transformation to reorganize and better align the agency's activities with the strategic imperatives for certification in the coming years. This process must enable the FAA to shift resources to focus on areas of greatest safety impact, including engagement with international regulatory authorities. Doing so will help the FAA retain its global leadership status and ensure a level playing field.

I want to stress that last point. The FAA must be a global leader in aircraft certification, and adhere to risk-based oversight principles that focus the agency's resources on areas of highest risk, provide timely and consistent requirements to applicants, and fully support and promote U.S. exports of aerospace products and services. This will ensure a growing and competitive world-leading U.S. aerospace manufacturing base for the next 100 years. I am privileged to be here today to discuss further ways in which we can advance these important priorities.

Thank you for the invitation, and I look forward to answering your questions.

Mr. LOBIONDO. Thank you, Mr. Hamilton.

Mr. Thacker, you are recognized.

Mr. THACKER. Chairman LoBiondo, Chairman Shuster, Ranking Members Larsen and DeFazio, members of the subcommittee, thank you for inviting me to testify this morning on the state of American aviation manufacturing. My name is Michael Thacker. I am senior vice president for engineering at Textron Aviation.

Textron Aviation is the leading general aviation authority and the home to Beechcraft, Cessna, and Hawker brands, which account for more than half of all general aviation aircraft flying. Textron Aviation provides the most versatile and comprehensive business and general aviation product portfolio in the world through five principal lines of business: business jets; general aviation and special mission turboprop aircraft; high-performance and utility

piston aircraft; military trainer and defense aircraft; and a complete global customer service organization. During the past 90 years, Textron Aviation has delivered more than 250,000 aircraft to more than 140 countries worldwide.

Textron Aviation appreciates the efforts being made by FAA leadership and the support of Congress for streamlining aircraft certification processes. While progress has been made, opportunities remain to consolidate the gains and capture the full benefits of the changes. As an aircraft manufacturer, Textron Aviation's success in the certification process and in business requires a clear path to compliance consisting of three primary elements: clear and stable aircraft requirements; clear and consistent documentation expectations; and consistent and appropriate levels of regulatory involvement.

Textron Aviation would like to thank Congress for passing the Small Airplane Revitalization Act. The resulting public law encouraged timely completion of the part 23 rewrite effort. We should see near-term benefits from the continuum of safety approach to product categorization, and over time should see more rapid incorporation of safety and efficiency-enhancing technologies through the more streamlined process of using industry standards to achieve consensus on new means of compliance.

Textron Aviation would like to see this philosophy and approach expanded beyond part 23 to include other categories of aircraft. We believe the safety and efficiency benefits would transfer.

Textron Aviation also applauds the intent of the FAA's ongoing transformation of the certification organization. The FAA's outreach and collaboration with industry to refine the implementation plan will be an important factor in its success. While the top-level reorganization helps establish a vision, the implementation will determine if real and tangible results come from the change. Textron Aviation is pleased to be involved with these efforts, and looks forward to continued engagement going forward.

Both of these efforts move in a positive direction, but leave work to be done. As with the part 23 effort, Congress and this committee can play an important role in working with the FAA and industry to advance certification and regulatory reform. The certification titles contained in last year's committee-passed bill and the Senate-passed FAA reauthorization would have provided an important framework and direction for these reform efforts.

Specifically, we support language that supported fuller utilization of ODA, improved validation and acceptance of products globally, and reduced inconsistent application of regulations. Passing such provisions in an expeditious manner this year would benefit safety, innovation, jobs, and our Nation's competitiveness.

Also included in my written testimony is an appendix, including comments from other Textron businesses impacted by the topics being discussed today. This testimony is for the record, and any questions related to the appendix can also be addressed for the record.

Before closing, Textron Aviation would also like to acknowledge the contributions and accomplishments of Associate Administrator Gilligan. We understand that she has announced her retirement, and we would like to thank her for her hard work, her consistent

engagement with industry, and her efforts to improve aviation safety processes.

And for all of the committee, particularly the chairman and the ranking member, we would like to invite you to come see aviation at work at any of our facilities, but particularly in Wichita, Kansas, the aviation capital of the world. It is important to understand how important this industry is——

Mr. LARSEN. I object.

[Laughter.]

Mr. THACKER. It is important to understand——

Mr. LOBIONDO. Overruled.

[Laughter.]

Mr. THACKER. It is important to understand how important this industry is to our Nation, and to see and touch the workers who make it the vibrant and important industry that it is. We would love to have you.

Thank you again for the opportunity to testify, and I look forward to answering your questions.

Mr. LOBIONDO. Thank you very much, Mr. Thacker. Now we will go to—start with questionings.

Mr. Shuster?

Mr. SHUSTER. Thank you, Mr. Chairman. My question deals with delegation authority. And I believe that Textron and Boeing have designees in your companies that respond or report directly to FAA. And I think it is really important for Members to hear and understand how that works. Because we say "delegation authority," and, you know, 5 and 6 years, 7 years ago I didn't understand it, and now I think I understand it better.

But if you would, Mr. Hamilton, why don't you explain how it works? And, Mr. Thacker, maybe you could talk about the benefits that you get from having that. So, if you would, Mr. Hamilton?

Mr. HAMILTON. Certainly. So I actually come from a unique perspective in that I, in my previous role at Boeing, was the ODA administrator for Boeing in the commercial side. So I have a pretty good understanding of that.

You know, the ODA is the current form of delegation from the FAA. Delegation has been around since the 1950s in different forms. And in the current ODA, what it is is the FAA delegates to, essentially, the company certain privileges. And those privileges typically are documented in a manual of some form. And with it come both the privileges, but also restrictions or things where you are not delegated.

The delegation is a privilege to our company, and probably to any other company. But it is a valuable resource when you look at the amount of work that is going on in aerospace, and how to best maximize the total resources that are available to the industry.

With delegation, there are some things that we have to submit to the FAA and request to be delegated, and there are other things that are just automatically delegated to us. We typically start with requirements, and—which feed into the design of the product. The certification approach—so how are you going to comply with requirements, whether it is through test, analysis, simulation, and then some form of deliverable. And that may be a document that

says, "Here is how we demonstrated compliance to the rule." And each of those can be delegated or retained by the FAA.

Now, the FAA also has something called participation, which is something that has fairly been—we are seeing more of, where the FAA delegates, say, a flight test to you, or a test to you, but chooses to come along and witness it with you.

Now, as I think Peggy pointed out, we have seen increased delegation, and we thank you for that. Participation, where we have also seen increases in, and that sometimes can delay work still on the critical path.

We really like to work with the FAA on requirements upfront, and then allow the certification work to proceed, and then allow the FAA to do systemic oversight of the process, so that they can assure that we are abiding by our manual.

Mr. SHUSTER. And is it accurate to say those folks are on your payroll, but they directly report to the FAA Administrators, or the FAA folks in—is that accurate?

Mr. HAMILTON. So they are employees of the Boeing Company. Boeing pays their salary. They wear a Boeing badge, just like I do. But they wear two hats. And I always tell them, "You have to understand which hat you are wearing." In some cases they can be the Boeing subject matter expert on a specific system or design, and at other times they are working as an accredited representative for the FAA, and in that case they weren't wearing their FAA hat, they have to abide by the regulations and the guidance they receive.

Mr. SHUSTER. And, Mr. Thacker, if you could, just talk about the things you see, the benefits that you have seen.

Mr. THACKER. Certainly. So the benefits of the organizational designation are both to industry and to the FAA.

From an industry perspective, it allows us to be able to move more quickly with production changes, small changes that are routine within our business.

And for the FAA, it allows them to focus on things that are of the highest safety importance, or that are new and novel and unique, and that require their attention to make sure that we are complying appropriately when we are introducing new technologies.

From a matter of being able to operate the business, it allows us to both continue operating the business for existing products, put new safety technologies mandated equipment into the aircraft quickly and efficiently, and still be having the larger new product development programs going on at the same time, which consume more of the FAA's involvement.

Mr. SHUSTER. Thank you.

Thank you, Mr. Chairman.

Mr. LOBIONDO. Mr. DeFazio?

Mr. DEFAZIO. Thank you, Mr. Chairman.

Ms. Gilligan, in your testimony you talk about something that I would just like to have explained better. It is having to do with airworthiness directives. Whereas when we promulgate an airworthiness directive, most other aviation authorities apparently forward that to operators and they abide by it.

But I—it seems from the testimony that it can't work the other way. That is, if EASA, you know, has one, we can't adopt it. Why is that?

Ms. GILLIGAN. Yes, sir. The requirements that we have for rulemaking, legislative requirements for rulemaking, require that the agency make its own finding, in essence, that in fact there is a safety issue. We do find that at times it is somewhat redundant because, again, we rely on many of our partners for the original certification of the product. When we validate that, we expect them to be responsible for the continued operational safety, and yet we have to go through a process of notice and comment before we can put in place the directives that they may have put in place for their product in other States.

We have talked with staff to see if there might be something that would be helpful. And, in fact, in the bill that was worked on last year there was some language that we think would be helpful, and we will certainly look to work with you again to try to support that.

Mr. DEFAZIO. So, I mean, the net result is that, although I assume that many operators might go ahead and comply with it once they become aware of it, but it is not mandatory because we haven't been able to adopt a rule.

Ms. GILLIGAN. That is correct. We can't enforce it.

Mr. DEFAZIO. Right.

Ms. GILLIGAN. We do, of course, see that many operators implement it. They are sometimes hesitant because it is not inconceivable when we go through our process we might have some nuance change or something that we find necessary. But generally they will follow what they learned from the manufacturer directly, and that is why we were looking to see if there might be some way we can streamline that process.

But the Administrative Procedures Act right now is a piece of the puzzle that we are struggling with.

Mr. DEFAZIO. And then the issue I raised about the European authority and the charges they levy to essentially rubberstamp what the FAA has already done, have there been discussions with the authority regarding that?

Ms. GILLIGAN. Yes, sir, extensive discussions. We actually did get a small reduction shortly after we entered our bilateral agreement that oversees how we relate to EASA. We are close, I believe, to getting an agreement on how we will further reduce the fees on large projects. But, as I testified, we do already have agreement with the European Aviation Safety Agency that there are certain approvals that we give that they will simply accept, so there will be no work for them to do, and there will be no charge. And that has already been put in place.

There are some other approvals that need some administrative work for which there will be minimal fees, and that has already been put in place. Now we are taking on the larger, more complex projects to reach agreement as to how we will reduce the time we spend and that they spend on projects, and thereby reduce their fees. So I hope to have some real progress on that, if not before I leave, not long after.

Mr. DEFAZIO. OK. Thank you.

Thank you, Mr. Chairman.

Mr. LOBIONDO. Thank you, Mr. DeFazio. This question will be for Ms. Gilligan.

Cybersecurity has rapidly risen to the top of the list of things for us to look at, and challenges for us to figure out. Ensuring the cybersecurity of the national airspace and all of its components is a priority for this subcommittee. In the FAA extension, we directed the FAA to create a comprehensive and strategic framework for cybersecurity, and the FAA Tech Center has ongoing work at the cyber task force lab.

Can you talk to us about how the FAA is utilizing that cyber task force lab at the Tech Center with their expertise in developing certification standards?

Ms. GILLIGAN. Sir, as you know, we rely on the work at the Tech Center quite extensively. And cybersecurity, as it relates to aircraft design, has been an issue that the Aircraft Certification Service has focused on for quite a long time.

As you point out, what we are realizing, what we understand—I think we always realized it—is that we need to be looking more holistically, to make sure that the—not just the aircraft, but the entire aviation system is properly addressing cybersecurity. And that is really the work that the Tech Center is helping to support.

We have interagency groups that include many of the others, the other agencies that are involved in cybersecurity kinds of work. They bring their expertise, as well as, then, our expertise on aircraft design, and the FAA expertise on the air traffic system design. And all of that is being brought through at the Tech Center to test scenarios, to understand where we may have hazards, and how we might mitigate those risks in the future.

Mr. LOBIONDO. Thank you.

Mr. Larsen?

Mr. LARSEN. Thank you. Could you just clarify? Is it—Doctor, your last name pronunciation for me? Yes, sorry.

Dr. EPSTEIN. You, sir, can call me anything you like. But it is Epstein, usually.

Mr. LARSEN. Epstein, great. All right. Great, thanks a lot. So, Dr. Epstein, could you comment on Pratt & Whitney's experience with ODA? I noted in your written testimony you are looking at expanding its use as your production demand grows. And with that growth do you anticipate problems? Or what would you say would need to be changed?

Dr. EPSTEIN. Well, Pratt & Whitney has ODA authority for manufacturing. It does not have it for design certification, mainly because, as the FAA was rolling this out, in our design cycles it didn't match very well.

But for manufacturing, since 80 percent of our content we purchase, and of that 80 percent, 80 percent is purchased here in the U.S., the supply base is of critical importance. And the supply base is very heavily strained because of the expansion in business, the concerns of safety, and it is a very capital-intensive business to begin with. So we found that ODA for manufacturing has been a very powerful way for both our in-house manufacturers, but also as we bring on new suppliers who have to be certified.

We are also looking forward to the discussion on certified design organization, which the FAA intends to move to, and we think that will be a powerful tool for U.S. industry to move forward.

Mr. LARSEN. Yes, great.

Mr. Hamilton, how can we move this potential 14-month timeline that you mentioned in your testimony with regards to international validation to something less than 14 months?

Mr. HAMILTON. Thank you, Congressman. So, as new entrants really come into the aviation industry, such as China, where they want to build an aviation industry, they are using sometimes the validations as opportunities to learn about how to certify products. And sometimes you might even ask that—the question if they were trying to get some of your intellectual property, and how you design the products.

I want to, you know, cite Ms. Baker, who just returned from China, for the constructive dialogue they had last week. You know, we deliver about one-third of our 737 airplanes to China, and we were told that they wouldn't be able to validate those airplanes until the end of 2018, initially. I think, through the dialogue between the FAA and the Chinese authorities, we are hopeful that we can shorten that down to midyear of this year. But I think it takes a strong relationship between the FAA and their counterparts overseas.

Mr. LARSEN. So it is almost like it is not so much a process issue, it is a presence issue.

Mr. HAMILTON. You know, our industry is built so much on relationships. And being there, being present with them, can go a long ways, especially with the Chinese. We are a little disappointed the FAA pulled out their technical representative from Beijing and put him in Singapore. The Chinese kind of took that, I think, in a negative manner.

But being present, being there, the importance of being able to travel there is vitally important. And being able to have those face-to-face conversations.

Mr. LARSEN. Mr. Thacker, wouldn't you agree that some people also have a claim as the aviation capital of the world?

[Laughter.]

Mr. THACKER. So I am sure there are many claims.

[Laughter.]

Mr. LARSEN. Good. Well, then, we are back on track. We are back on track.

What recommendations would you have to change the ODA process, if any?

Mr. THACKER. So I think that the biggest opportunity is really to fully utilize the designations that are already in place. So, for an organization like ours, we are a very capable and large organization. Our ODA staffing is across the spectrum of all of the technical resources.

And, frankly, we have the capacity to overwhelm the FAA with the amount of new product development and continuing product improvements that we put in place for a product line that today produces 21 different models. And we have three products, three new products, in various stages of development.

So, the ability to, again, reduce the level of involvement for the things that are low-risk—you are familiar with many of our products. They are, for the most part, derivatives. They are airplanes that look similar, have similar systems. And so, for the past decades we have been designing with the same design philosophy, with developing tools along the way, improving the reliability, and then putting the efficiency and safety into the products. But the basis of what we are doing is well understood by both us and the FAA.

So, it is a very low risk for the bulk of what we do for the FAA to go ahead and delegate most of those programs to us, and then pay their attention to the things that are new and novel, or new and novel to us, if we are taking on a new technology. We would like to see that be—to the fullest extent possible, we think that is the greatest opportunity.

Mr. LARSEN. All right, OK, thank you.

Thank you, sir.

Mr. LOBIONDO. Mr. Graves?

Mr. GRAVES OF MISSOURI. Thank you, Mr. Chairman. I got just a quick question for Ms. Gilligan.

And I am very curious as to if you can give us an update on the FAA's efforts to certify unleaded avgas [aviation gasoline], at least on a fleetwide basis.

Ms. GILLIGAN. Thank you, Congressman Graves. I appreciate the opportunity to talk about this fabulous success, which has also involved the Tech Center work, as well, Mr. Chairman.

We are very far along on identifying a replacement for leaded fuels for general aviation aircraft. I know you are familiar with it, and this committee has very much supported that work, as has the Appropriations Committee. We are testing two fuels right now. We are actually flight testing them, and we thank Textron and a number of other companies that have provided in-kind contributions to this effort by providing airplanes and crew to fly these flight tests so we can better understand whether and how these fuels will interact between engines and aircraft.

The challenge for us when we finally approve replacement fuels, which will happen shortly, I believe 2018, next year. The way our process works right now is we would have to certify the new fuel in each engine aircraft configuration, because we were never before faced with the idea of a whole new fuel for a whole new fleet of multiple kinds of aircraft. And so we have worked again with this committee and staff on last year's bill to provide authority for us to look at this in a much more holistic way.

And again, with this year's reauthorization, we will be asking for that continued kind of support, and be glad to provide technical assistance to the committee so that we can—once we have the new fuel, we will have a much more efficient way to be able to approve it and get it into the system.

Mr. GRAVES OF MISSOURI. Well, the more—and I am sure the committee is very interested in doing everything they can to further that and help it along. Please keep us informed. And I know you do a very good job of that, but please keep us informed as we move forward on that.

Thanks, Mr. Chairman.

Mr. LOBIONDO. Thank you, Mr. Graves.

Ms. Eleanor Holmes Norton.

Ms. NORTON. Thank you, Mr. Chairman.

Mr. Epstein, I have a question about airplane noise, particularly—and I know that you mentioned ways to reduce such noise. The noise has become such a pervasive issue that some of us in the Congress have formed a bipartisan coalition called Quiet Skies.

Here, for example, in my own district, the District of Columbia, the noise from planes coming in to and going out of Ronald Reagan Airport have become just a major issue. People can't sleep. Now, there are a number of reasons for this: NextGen, or new flight patterns; some planes come pre-dawn or late at night; older planes.

I was pleased to hear that Pratt & Whitney was engaged in something you call the PurePower Geared Turbofan engine. And you said in your testimony it will result in a 16-percent reduction in fuel burn and three-quarters reduction in noise footprint. That was what most interested me.

When do you think we can expect to see planes with new engines taking off from places—major airports like Ronald Reagan with such equipment to reduce noise?

Dr. EPSTEIN. Thank you, ma'am, for the question. There are about 45 PurePower-powered airplanes flying.

Ms. NORTON. Would you speak up, please?

Dr. EPSTEIN. There are about 45 PurePower airplanes flying. Spirit is the sole American operator. They just started flying last year. More are being delivered this year. The Boeing MAX, 737 MAX, is also an extremely quiet airplane. These——

Ms. NORTON. You have less complaints, as far as you know, about noise from these newer planes?

Dr. EPSTEIN. Well, complaints about noise is a flexible concept. I was once sitting next to the director of the Port Authority of New York, and I asked him how quiet airplanes would have to be so he didn't get noise complaints. And he looked at me like I was nuts and said, "This is New York you are talking about. If they know the airplane is there, they will complain about the noise."

Ms. NORTON. Mr. Epstein, this is the District of Columbia I am talking about. And the fact is that the noise has become a major issue here and elsewhere. And we are not—and we can compare it to noise before to noise now. So I am not asking you to wipe away all noise.

I am pleased to hear you talk about more planes coming on. Do you believe at nationwide airports we will soon see most airports with such planes?

Dr. EPSTEIN. Yes, the narrow-body fleets are converting to these new types of engines over the next 2 years, so all the new airplanes coming in by 2019 or so will have these very quiet engines.

Ms. NORTON. It is very important to hear, because then we will be able to blame just NextGen or flight patterns, rather than the noise from the airplanes themselves.

Ms. Gilligan, I have a question for you, because I introduced a bill last year called the No Lead in the Air Act, and its main purpose was to give a deadline for the use of lead in aircraft, and it was 2021. In your testimony you said—and here I am quoting you—that "the FAA will need continued congressional support to

streamline the process to approve the use of new fuels in the more than 160,000 general aviation aircraft."

What actions do you believe Congress needs to take to support this transition to all unleaded fuel? And do you think, or would you recommend that we try to include this in any upcoming reauthorization?

Ms. GILLIGAN. Thank you, Congresswoman, for the question.

Yes, we do believe that we need some additional support from Congress to be able to quickly approve the use of unleaded fuels in such a large fleet. Right now our standard practice would be to have to certify each aircraft and engine combination for the use of this new fuel. And given the kinds of numbers that you see in my testimony, we believe that that would just be too long and be very inefficient.

So we did work with committee staff for the last year's reauthorization, and we will continue to work with staff on this year's——

Ms. NORTON. You think we do need, and you think we already are on top of what we need Congress to do?

Ms. GILLIGAN. Yes, ma'am, in last year's bill that was passed through the committee we did see the kind of support that we need, and we will continue to look at the language and make sure we get it exactly right.

Ms. NORTON. Thank you, Mr. Chairman.

Mr. LOBIONDO. Mr. Perry?

Mr. PERRY. Thanks, Mr. Chairman, and thank the panel for your presence.

Ms. Gilligan, last year's short-term extension directed the FAA to establish a UTM [UAS Traffic Management] pilot program by April of this year, preceded by a research plan. And that was to be submitted to Congress by January. So I am just wondering what steps the agency is taking to ensure that the pilot program is on schedule, and in regard to that, what extent have you engaged in your business.

Ms. GILLIGAN. Thank you, Congressman. The UTM program is a combined program between FAA and NASA, and it is working really quite well. We have a team from both agencies that are focused on building the plan and the roadmap that you discussed, and there is extensive industry involvement, both in designing that and in looking at where and how we can pilot those concepts.

We can certainly provide some details for you for the record, if that would be helpful. I don't have the dates, off the top of my head.

Mr. PERRY. OK, so—yes, I would like the information on industry. And, you know, from my standpoint, it is not just big industry, although a lot of great ideas come from big industry. But there is a lot of small-town industries that can provide a lot of valuable input. And I would just like to know if they are being included.

And what about the schedule? Where are we at with the schedule, with the pilot and with the plan?

Ms. GILLIGAN. Yes, I apologize. As I said, I don't have the dates off the top of my head, and we can certainly provide those.

The smaller organizations that are part of the UAS community are broadly represented by some of their advocacy groups here in

DC. And through those groups we can get individual small operators or small businesses involved, as well. We will provide——

Mr. PERRY. Is there any opportunity for individuals or individual companies that don't belong to a consortium that might have a wonderful, fabulous idea that you have never seen? How do they get involved?

Ms. GILLIGAN. Well, we last year had a symposium, a UAS symposium. We will be having another one this year in March.

Mr. PERRY. OK.

Ms. GILLIGAN. That will be an opportunity for——

Mr. PERRY. I need the information on that, as well.

Ms. GILLIGAN. Absolutely.

Mr. PERRY. Can you let us know what the agency envisions for a certification process for unmanned traffic management? Is it going to be, like, self-certification, similar to the National Highway Traffic Safety Administration's guidelines for automated vehicles? What do you envision?

Ms. GILLIGAN. Right. Those are exactly the concepts that we are looking at through the UTM pilot to understand how best to allow that community that will operate at very low altitudes to make the most efficient use of that airspace, recognizing as well there are some general aviation operations that occur in that airspace, as well.

But, yes, we are looking less at something like the very elaborate air traffic services that we provide to large manned aircraft at high altitude, and something much more scalable to the kinds of operations that small UAS at low altitudes could benefit from.

Mr. PERRY. All right, great. Thank you, ma'am, for your service, as well. And congratulations and good luck.

Mr. Thacker, can you share any examples of times where the inconsistent regulatory environment has—or interpretations or reinterpretations have impacted your business and your business line?

Mr. THACKER. So certainly we have had that. We have had examples of that, both from a domestic standpoint, where interpretations between ACOs have been different, and on an international standpoint, where the validation activity that we have had with a Brazil or a Europe ended up resulting in months of delays because of a disagreement between the FAA and that organization, all of which, in the end, is a competitive disadvantage to us and our ability to deliver products to customers.

So we are—for each of those validations we have a timeline. You have to have a customer already signed up to get those agencies even to take on the validation activity. So that customer is waiting for the airplane from the day you start the process. And so you end up at times losing those sales. So it can impact your business that way.

In terms of the inconsistencies between ACOs, I think that just comes down to the type of business that flows through those ACOs on a regular basis. And so sometimes something that is very familiar in one is not in another, and that drives an increased level of scrutiny that can be of a disadvantage to one or the other entities.

Mr. PERRY. So in an instance where, for instance, or for example, you lose the sale, what is the relevant impact to the community for

where manufacturing is taking place, for your supply chain, for your employees, et cetera?

Mr. THACKER. So I think most of this committee is familiar with the state of general and business aviation. Since 2008 it has been a difficult business environment, to say the least. Every aircraft sale matters. And in a very globally competitive environment where for—the markets we serve, our competitors typically are foreign-owned companies, as well, every sale matters, and every sale does add up to U.S. jobs.

Mr. PERRY. Thanks, Mr. Chairman. I yield.

Mr. LOBIONDO. Thank you. Ms. Titus.

Ms. TITUS. Thank you, Mr. Chairman.

Ms. Gilligan, I would like to add my congratulations and thanks for all your service, too. You have overseen the tremendous changes and advances in the use of our airspace, and directed a lot of that, and we thank you for it. I hope we will continue to see women involved in the top level of the FAA, and they will have big shoes to fill.

You know, we have heard recently through an Executive order that there is kind of this two-for-one. Two for one sounds great for happy hour in my district, but I am not sure it is a good way to run the FAA. We are going to have to remove two regulations for every regulation established. I believe this is the Executive order that President Trump signed.

I wonder if you would comment on that. Is it going to affect the FAA? It is kind of wide open right now. We don't know who all is included, but it could be you. And how will that impact trying to maintain the most complex, largest, and safest airspace in the world?

Ms. GILLIGAN. Congresswoman, we are still working with the Office of the Secretary and the Office of Management and Budget, along with most agencies around the Government, to really flesh out exactly what the expectations are through the Executive order. So we are not completely clear yet on exactly how it will be implemented.

But we do know that a number of our rules, like part 23, we are putting rules in place to reduce burden, to, in fact, enable new technologies—for example, UAS. So we believe a number of the initiatives we have underway will fall within the expectations of the Executive order. But again, the details are still being fleshed out, so we don't fully understand exactly how we will implement it yet.

Ms. TITUS. It is a little scary to think that you have to strike two rules in order to create one new one, though, isn't it? Aren't the rules that you have put in place pretty valid and helpful, and you wouldn't want to just arbitrarily get rid of them?

Ms. GILLIGAN. I would completely agree with you. But what we do see, as we saw with part 23, for example, historically we tended to do very prescriptive rules. We told the manufacturer, for example, or the operator, the specific technology or the specific thing they had to do.

What we have learned with part 23 is you can describe the outcome that we need. It must perform this function, or the aircraft must fly in this way, and that allows innovation and it enables

manufacturers, for example, to get product to market more quickly and as safe or safer than what we have in place now.

So again, to the extent some of our new rules will have that kind of an approach, we believe that will fit the expectation of the Executive order.

Ms. TITUS. Could the industry comment on that?

Mr. HAMILTON. From our standpoint, we realize it is a complex issue. And I applaud what the FAA did with part 23. I don't think we—we work under mainly part 25 and part 21, and I don't think the same approach to part 25, where you throw it all out and rewrite it, is really what we want. I think you want to, like a scalpel with a surgeon, go after some selective regulations.

As Ms. Gilligan said about—there may be a little bit more prescriptive—or they are based on propeller technology that we may want to go after and change those a little bit.

Ms. TITUS. When do you think this directive will be fleshed out, that we will know kind of what is expected of this two-for-one?

Ms. GILLIGAN. I don't know exactly. As I said, we are working with the Office of the Secretary and the Office of Management and Budget on that guidance now. So I would expect, as soon as——

Ms. TITUS. We have somebody that heads up that agency we might be able to get something done?

Ms. GILLIGAN. I am sorry?

Ms. TITUS. It was an aside.

Ms. GILLIGAN. OK.

Ms. TITUS. Thank you. I yield back.

Mr. LOBIONDO. Thank you.

Mr. Lewis?

Mr. LEWIS. Thank you, Mr. Chairman, and thank you to all the witnesses here today. We do appreciate your testimony.

I would like to highlight the importance of aviation manufacturing in my Second Congressional District in Minnesota. In 2014, as has been said here before, aviation manufacturing produced nearly $150 billion in total output; $30 billion of that came from general aviation purchases. It produces 5,000 jobs in my great State of Minnesota.

In fact, I recently had the pleasure to meet with the president of one of the general aviation manufacturers in my district. After touring his facility, I was able to see firsthand how manufacturing creates such a positive impact in my community and my district and across the State of Minnesota. I also saw how aviation innovation and supplemental type certification—modifications, I should say—help increase the safety for our pilots, passengers. But we need to sustain economic growth and industry growth alongside that.

So I asked this particular fellow to send me some advice, some real input. So I received this letter from Wipaire. They make floats. They are the largest manufacturer of floats. And in Minnesota, you have got as many planes with floats as you do wheels. And they brought to light in this letter—which I would like to submit, Mr. Chairman, to the committee—they brought to light some of the concerns the industry has when it comes to continuing to innovate, improve, introduce new technologies in maintaining aircraft.

Progress has been made, as we have detailed, to create a more efficient and effective certification program, but we need to do more. We need to do more to advance compliance and safety standard reviews. The FAA and this body need to provide our manufacturers with increased ability to sell products and services overseas.

As the preeminent nation for aviation with a great track record at the FAA, our FAA-certified components in aircraft should be accepted in the global market. We set a global standard of safety. And therefore, the U.S.-made-and-certified products should be easily available outside the U.S.

As I say, Mr. Chairman, I ask that this letter be submitted for the record.

[The letter is on pages 69–70.]

Let me start with a question for Ms. Gilligan. And thank you for your service over the years. And this is a little bit outside of the scope here, but it is certainly starting to become an issue. And that is what sort of challenges for the FAA can you see in the future, as we start to see so many more unmanned aircraft—drones, as everybody calls them.

How does that affect FAA's mission for safety, for certification in some cases, just going forward? I mean has the agency looked at that and anticipated a plan? There have been some things done already.

Ms. GILLIGAN. Yes, sir. We are well aware of the challenges that we face with the increase in unmanned systems—or drones, as you have referred to them. A year and a half ago we created a registration requirement so we could begin to know who is operating, and in some cases how many aircraft they are operating.

And, more importantly, to use that as a tool to educate this new community, because many folks who are purchasing these, especially for personal use, are not aviators by background or training, and they—we used to laugh that they didn't know they were violating the National Airspace System because they didn't know there was a National Airspace System. And so we have——

Mr. LEWIS. Let alone the privacy in my backyard. Yes, right, exactly.

Ms. GILLIGAN. There are those issues, as well. So we are well along. We have also issued an operating rule that allows for operation of aircraft under 55 pounds within visual line of sight and with some other restrictions. We have also put in place in those rules the ability to provide waivers if an operator can demonstrate that they can mitigate risk of going beyond visual line of sight, for example, or operating at night with technologies.

Mr. LEWIS. Have you incorporated a growth factor in all of this? I mean this is, I mean, becoming much more frequent——

Ms. GILLIGAN. Yes.

Mr. LEWIS [continuing]. In every neighborhood.

Ms. GILLIGAN. Yes. We believe that the rules that we have put in place are flexible enough to address the growing demand. Again, the rules right now, though, are up to 55 pounds. For larger aircraft right now, those are going through certification, and Ms. Baker can comment on how many projects we have to actually cer-

tify meeting our full set of standards, these larger aircraft that will be used for larger missions.

Dorenda?

Mr. LEWIS. We have only got about 20 seconds, so——

Ms. BAKER. OK. Just—we have assigned that to our Los Angeles ACO, and currently they have 12 different projects working on certification of unmanned aircraft.

Mr. LEWIS. My time is just about up, but I would like to revisit this, as it seems to be certainly a growth industry. I thank you all for coming today, and I yield back.

Mr. LOBIONDO. Mr. Payne?

Mr. PAYNE. Thank you, Mr. Chairman and Ranking Member. And Ms. Gilligan, we wish you well. I am sorry I haven't had the opportunity to get to know you, but your reputation precedes you in the work that you have done for this Nation. So thank you.

The FAA's Organization Designation Authorization program appears, really, to be critical to allowing the agency to keep up with its certification process. In fact, the industry is calling on you to expand it.

But can you speak more to the funding issues that plague the agency, and how those issues hinder your labor force and prevent you from expanding the ODA program?

Ms. GILLIGAN. Yes, sir. And I will ask Ms. Baker to supplement it, as well.

Actually, the delegation program allows us to be more effective with the resources that we are provided, because we can take advantage of the technical expertise within a company to work on our behalf, and to make those kinds of safety findings.

But, Dorenda, perhaps you would like to speak about the staffing?

Ms. BAKER. Yes. As Peggy said, it is very important for us to use the opportunities like the Organization Designation Authorization, because it does leverage us. We have about 700 engineers, whereas Boeing has approximately 900 UMs, people that are working on our behalf.

So, this is something that is really important, and it does help us to utilize the resources that we do have efficiently and effectively.

Mr. PAYNE. Thank you. And, you know, to the panel, but based on testimony by Dr. Epstein, you know, is the industry open, you know, to additional user fees that would give the FAA more budgetary cushion to expand its labor force to meet the increasing demands of the certification process?

Dr. EPSTEIN. This is the most cost-conscious of industries, since we are so highly competitive. So we certainly have to examine what the impact would have on the competitiveness of products and exports as to what that fee schedule might be.

Mr. PAYNE. OK. And Mr. Hamilton, we all understand Boeing's global reach. And I would like to know your experience in dealing with the EASA, and how it compares to your experiences with the FAA, particularly in the certification process. Where do they have—that we meet, and vice versa?

Mr. HAMILTON. EASA, E–A-S–A, is the European equivalent of the FAA. And they are a newer organization. It just really came

about a little over a decade ago to cover one European regulatory [sic].

Because they are newer, they—I will say—are starting from a position of trying to be more efficient, more nimble. They are a much smaller organization than the FAA. And as we have talked here today, when you have critical resources, it is how do you use those resources most effectively.

We find that EASA has a delegation authorization with the manufacturers over in Europe that takes it to a—I will say a further extent beyond today's ODA that we have over in the U.S. With it, again, comes certain requirements for oversight. But it is a—it tends to be a little bit more efficient, in terms of working with them.

I think, from a rulemaking—the FAA has done a lot over the years to harmonize on rules. I think really it gets down to—and we talked on it earlier—was about interpretations of those rules, where there can be different interpretations of how the same rule is applied. And that is kind of an ongoing effort that we have to work through.

Mr. PAYNE. OK, thank you.

Well, Mr. Chairman, in the interest of time, I will yield back.

Mr. LOBIONDO. Thank you, Mr. Payne.

Mr. Westerman?

Mr. WESTERMAN. Thank you, Mr. Chairman, and thank you to the distinguished panel for being here today.

Ms. Gilligan, this is a milestone for you and me. It is your last Aviation Subcommittee meeting, my first Aviation Subcommittee meeting. So I am reminded that a lot of people have come before us and a lot of people will come after us. And I trust they will do good work.

I have heard it said before that the best illustration of trust is to step on an airplane, where you are trusting the people who certified that airplane, you are trusting the engineers, the people manufacturing, the whole system, you are trusting them with your life. And it is so important that we maintain that trust.

As there has been a lot of discussion on the importance of improving efficiency of the top of certification process by using risk-based approaches and applying safety continuum principles to better focus FAA's limited resources, can you talk about how you apply your risk-based approach to certification projects, such as determining the level of FAA involvement and the use of delegation, which has already been talked about a little bit?

Ms. GILLIGAN. Yes, sir. But I would ask that Ms. Baker provide that information. She actually runs the organization responsible for these certifications and has provided quite a bit of leadership in that area.

Ms. BAKER. Thank you for the question. We are very proud of what we have been able to accomplish in the area of utilizing the risk-based decisionmaking. We have actually implemented tools that will help standardize the way that our engineers will evaluate an individual project. And then it identifies areas where we would expect that it be delegated. And if it is not delegated, then there needs to be a justification as to what the certain circumstances are that would be different from the norm.

You mentioned the safety continuum. That is something that we also feel is very helpful in our evaluation of how to put the right amount of rigor in the right areas. Many of you are familiar with our experimental aircraft certification, which is someplace where society accepts quite a bit of risk. It is maybe a recreational application. So what you can compare it to is something like a motorcycle. And then you can go up to the top of the continuum, where you have transport category aircraft like the Boeing aircraft, where society accepts zero risk. The tolerance is very, very low.

And so, when we are looking at our projects, we want to make sure that we are putting our efforts in the area where we have the greatest level of risk if we don't take care of the issues at that area. Society does not accept any risk, we need to focus our efforts in that area.

Mr. WESTERMAN. So have you classified airworthiness requirements based on risk or impact or safety of flight?

Ms. BAKER. Yes. We actually went through all of our regulations. Some of them are relatively simple. You stress something until it breaks. Other times it is a very sophisticated analysis. And so things that are very simple to apply and have low probability of being applied inappropriately and the consequence of that failure is protected by some redundancy in the system, that would be a low-risk area. And then there are other areas where we are very sensitive to the risk.

Mr. WESTERMAN. So you mentioned low-risk areas. That would be, like, cabin interiors and seats. Do you measure the effectiveness of implementation by monitoring whether there is a lot of technical workforce involvement in those areas?

Ms. BAKER. We do look at that, but I think I need to clarify. There is a misconception that interior items are a very low-risk area. What we want to assure is that the passengers are protected in the event of an accident. And so there are complexities in the design as the airlines try to specialize their interiors to suit their customers.

So we have a lot of complex interiors, as you may have seen, with video cameras and videos at the stations, and sometimes doors in between different compartments. And so it gets more complex than I think the average person really appreciates.

Mr. WESTERMAN. OK. And, Mr. Hamilton, you mentioned that not only are 90 percent of Boeing's 148,000 high-tech, good-paying jobs U.S. jobs, but there is also an additional 1.5 million U.S. jobs in your supply chain, which—some of those come from my hometown and my congressional district.

And you also noted that the FAA must remain global leaders in aircraft certification, and you listed some bullet points. The last one was that the FAA must fully support and promote U.S. exports of aerospace products and services. Can you elaborate on what actions you believe FAA should be taking in this regard?

Mr. HAMILTON. Thank you. I think when we talk about promoting, it is about being a leader, driving relationships, being present. "Promote" used to be in the FAA charter. It was taken out years ago. It is in the EASA charter. We talked about EASA earlier. And EASA, they work hand in hand with the European manufacturers to promote their products to sell. And they are out there

trying to engage with other countries even around how they can help them.

We want the FAA to help promote American jobs, as well, and support the products that are built in the U.S. by helping us with the exports where we need it, or helping with key campaigns, and being there, working with the Government agencies on Government-to-Government contracts, making sure we have good, strong bilaterals that allow for ease of validations or other export requirements.

Mr. WESTERMAN. Thank you.

I think I am out of time, Mr. Chairman.

Mr. LOBIONDO. You are more than out of time.

[Laughter.]

Mr. LOBIONDO. Mr. Carson?

Mr. CARSON. Thank you, Chairman. I am very concerned that, as introduced, this new private panel does not include one of the largest users of the U.S. airspace, which is the Defense Department.

I would like to hear from any of the witnesses their views about how privatizing air traffic control could impact the coordination that currently takes place, and what the impact would be for our national security.

[No response.]

Mr. CARSON. OK, next question.

[Laughter.]

Mr. CARSON. I am interested to hear—I actually introduced a bill—I am reintroducing a bill. I am curious about your views on the addition of a physical barricade outside the cockpit. I have heard proponents point out this measure could be effective and not especially expensive, but I have also heard objections.

I am planning to offer an amendment to add a secondary barrier to all U.S. passenger carriers manufactured going forward. What are your thoughts? Is it an inconvenience? A security concern? Yes?

Ms. GILLIGAN. Mr.——

Mr. CARSON. Yes.

Ms. GILLIGAN. Congressman, FAA actually issued standards for a secondary barrier. And so it is available for designers to design against and for operators to request to have that installed. So it can be done.

I do think there are some real questions about the location of it, depending on the configuration of the aircraft and the aircraft exits. And obviously, we would want to assure that it doesn't interfere with any emergency egress that would affect passenger safety in some way. But the standards do exist and a designer can design to those standards, and an operator could, in fact, request that.

Mr. HAMILTON. I would like to just share——

Mr. CARSON. Yes, sir.

Mr. HAMILTON [continuing]. Our thoughts on that. And again, I applaud the words that were in the FAA reauthorization bill. But I caution you about putting prescriptive requirements in there like a secondary barrier.

Mr. CARSON. OK.

Mr. HAMILTON. I think we should step back and really look at what are we trying to achieve. You want to keep the bad people

off the airplanes, first. You know? Make sure TSA has strong procedures, keep them off the airplane.

Secondly, I think you have to look at what we have done already. There are part 121 regulations that govern the airlines on how to—when a pilot comes out of the flight deck. And those are quite effective today. I have been on flights where I have been asked, as an able-bodied passenger, to assist in case of an emergency.

Mr. CARSON. Absolutely.

Mr. HAMILTON. And I have been willing to do that.

Third, you have to look at the secure flight deck door that we instituted after 2001. It has been extremely effective.

So, I think the risk is—really has decreased significantly, between what TSA has done, what the part 121 rules govern, and the flight deck door. As Ms. Gilligan said, we have had airlines request a secondary barrier, and they have actually put it on and then taken it off because they found that the options through part 121 give them a little bit more flexibility and more efficiency in how to control the security of the airplane.

Mr. CARSON. All right. Thank you.

I yield back, Mr. Chairman.

Mr. LOBIONDO. Mr. Webster?

Mr. WEBSTER. Thank you, Mr. Chair. I would like to follow up on a question the Chair asked about cybersecurity with Ms. Gilligan.

The National Institute of Standards and Technology has a framework for cybersecurity. Does that in any way benefit your concerns or problems, or does it fit in any way the ones that would be specific to the aviation industry?

Ms. GILLIGAN. Congressman, I do believe that NIST is a part of the interagency work that is underway to look at standards for cybersecurity and those kinds of things. I apologize, I don't have the details, and we can certainly provide that back to you.

I don't know, Ms. Baker, if you are familiar with any of that work.

Ms. BAKER. No.

Ms. GILLIGAN. No. So if we could get back to you on the role of NIST and their standards, clearly, they always inform much of the work we do in security and other areas. I am just not particularly familiar with the work we are doing with them in this area.

Mr. WEBSTER. It seems like the—those that are perpetrating cyber crimes and so forth are very aggressive, and that their abilities are moving along at a very fast speed. Does the bureaucracy in any way hinder the counter to that, in your particular aviation authority?

Ms. GILLIGAN. First, I am pleased to say that any reports that we have received of cyber attacks on aircraft have been investigated by FAA, along with the FBI. And we have not been able to sustain that any attack has successfully occurred. And we believe that is because of the design standards we have in place.

But to your point, Congressman, we do know that that community that is looking to hack into things is always looking for new ways. They are very creative. And so that is why we have brought together an interagency group to start to anticipate where might the threat be coming from, and what more do we need to do as we

look at design and maintaining the continued safety of the fleet that is already in operation. So we have a very extensive effort in that regard, and I don't believe that that will be slowed down as a result of bureaucracy. We understand the risk is too high.

Mr. WEBSTER. Thank you very much. I yield back.

Mr. LOBIONDO. Mr. Lipinski?

Mr. LIPINSKI. Thank you, Mr. Chairman. I want to start out by asking Ms. Gilligan about a bilateral with the EU. I understand there is important revisions to the technical implementation procedures of this bilateral that are pending. It is my understanding this will help improve the validation process surrounding aviation products. When do you think that these revisions will be adopted?

Ms. GILLIGAN. Congressman, Ms. Baker actually negotiated those revisions, so I will ask her to respond to you.

Mr. LIPINSKI. Thank you.

Ms. BAKER. You are probably familiar with our validation improvement roadmap. And we were working through that to rely more heavily upon each other, and in some cases fully on each other.

The latest revisions we had gone forward to try to take a pretty aggressive approach, and had to take a bit of a step back so that we could think through some of the things that we wanted to do that were much more ambitious. So we are going to be issuing what we call a TIP Rev 5a in the near term, in the next few weeks. And then we will, by the end of March, issue a TIP Rev 6. And in those what we are trying to do is, again, rely more heavily upon each other, avoid the redundant work. And, as we move forward past what were very basic, complex modifications to aircraft, we are going to start incorporating full reliance on each other for things like engines and propellers and then, later, small airplanes.

Mr. LIPINSKI. And that is something that is very important and gets done as quickly as possible, because it would be very helpful to the American aviation industry.

I want to check with the chairman. I think the clock didn't restart at the beginning of my question time, because I don't think I am that far along. So I just want to check with—make sure that was the case. OK. I won't take another full 5 minutes, don't worry. Thank you.

The FAA's Continuous Lower Energy, Emissions, and Noise program, also known as the CLEEN program, is a Government-industry research partnership which has leveraged millions of dollars of private money to develop and demonstrate certifiable aircraft technologies that are at high states of technology readiness. This program has worked very well, in terms of helping to actually produce aircraft that have lower noise, greater efficiency.

So I know that both Boeing and then Pratt & Whitney have been participants in a CLEEN program and Dr. Epstein had mentioned it in his testimony. So, Dr. Epstein and also Mr. Hamilton, can you speak about how these investments can serve as a catalyst for acceleration of new technology and its impact on American competitiveness in aviation manufacturing?

So Dr. Epstein?

Dr. EPSTEIN. These get to the heart of the competitiveness of our products. Airlines buy aircraft because of their fuel efficiency. Com-

munities welcome aircraft because of the lack of noise. And these are both focuses of the program.

Many of these technologies are just entering service now. And I see that the output from the CLEEN I program, which is just finishing up, will probably be in the next new airplane that will enter service in the next decade. And, in fact, as we speak we are running an engine down in West Palm Beach demonstrating very low noise capabilities and very high efficiency of new types of turbofan engines.

So, it is—we put up a lot of money for part of this program. So I think it is a great example of the catalytic effect that a relatively small Federal investment can make on this industry. And the FAA investment is focused on the relatively near term, which, for us, is 8 to 10 years, which is what it takes to prove a technology and then develop a product from it.

Mr. LIPINSKI. Thank you.

Mr. Hamilton, you want to add anything to that?

Mr. HAMILTON. I would agree that I think it is a great partnership with industry and the Government in terms of really promoting new technologies. We have flown an eco-demonstrator roughly every year with—to go prove out these technologies. And it allows us to accelerate the incorporation of those into new products.

So similar, the Europeans have a very similar-type investment plan over there, and I think this is a good product.

Mr. LIPINSKI. Well, this program has to be reauthorized, and I am hopeful that it is something that we are going to be able to do in the FAA reauthorization. I think it is something that has been very helpful to the American aviation industry, helped the competitiveness. And so I think it is something we need to continue.

So, with that, I will yield back. Thank you.

Mr. LOBIONDO. Mr. Duncan?

Mr. DUNCAN. Well, thank you very much, Mr. Chairman. And Ms. Gilligan, why are you leaving? You are much too young to retire.

Ms. GILLIGAN. Thank you, sir. But it seems it is time.

[Laughter.]

Mr. DUNCAN. Well, thank you for your work. I am interested in a lot of things. But I just want to ask about one thing. And this has been a long-time concern of mine. But 3 years ago this month we had testimony in this subcommittee that the—by Calvin Scovel, the inspector general, that the NextGen program had an original cost estimate of $40 billion, but that it was more likely to run two to three times that much. And it seems to me you are talking about some awfully big money if you are talking about getting up into costs possibly as much as $120 billion.

And I am just wondering, can you tell us where we stand today, 3 years later? And are costs still spiraling out of control, and what is the latest estimate or guesstimate as to the end cost of that program?

Ms. GILLIGAN. Sir, under Administrator Huerta, what we have done is reach out to industry to align our program with their priorities. We have a NextGen Advisory Committee, which is chaired by

one of our major airlines, and all of the stakeholders who have a part in the system are members of that.

And within the last 2 years—2 or 3 years now—we have requested that set of priorities from industry, and we have met all of their requests. So we are working very closely with industry. There are already measurable benefits for Delta, for example, at Atlanta, and a number of other major airlines at major airports. They are seeing the benefits of the efficiencies that come with the NextGen system. We can provide for you all of the detailed cost and benefit numbers, but I do believe industry would concur that we are on the right path, and that, in fact, the system is beginning to demonstrate the benefits that we have all anticipated.

Mr. DUNCAN. Well, you also testified that many of the key parts of the program that had original goals of being done by 2025 were going to have to be extended out to 2030 and even 2035. Do you—are we back on a better schedule than that, or——

Ms. GILLIGAN. Sir, I apologize, I am not familiar with the inspector general's testimony that you are referring to in the safety organization, I don't manage that program. But we work very closely with the NextGen program. And again, over the last several years, we have been delivering new systems and new technologies. The most recent one is the data communications technology, which is, in many locations, ahead of schedule.

So again, I think we would like to offer for you, our staff, the details of exactly how the program has been managed over these last 3 to 5 years, and show you the progress that we are making.

Mr. DUNCAN. All right. What I think would be good or helpful for the committee is to have somebody take a look. This testimony is mentioned in the briefing paper that we got, and it was testimony that—in a hearing on February 5th of 2014. And I would like to know where we stand, particularly on the costs and other issues that Mr. Scovel raised at that time, and whether it has gotten better or worse since then, and some of the specifics.

Ms. GILLIGAN. Yes, sir. We can certainly provide that. I believe there has been additional work by the inspector general since then, and very detailed responses by FAA to the inspector general recommendations. So we will make sure that you and your staff have all of that information.

Mr. DUNCAN. All right. Thank you very much.

Thank you, Mr. Chairman.

Mr. MITCHELL [presiding]. The Chair recognizes Mr. LaMalfa for 5 minutes, please.

Mr. LAMALFA. Thank you, Mr. Chairman. Obviously, we know the importance of the aviation manufacturing industry in this country for many decades, and what an economic as well as technological advancement that means for all of us here. So being a California Member, I have seen how we have been devastated in our economy by the departure of much of the industry. And so I am concerned about the regulatory load on that.

And then I also hear in committee here about people concerned about the plane sound. I live on a farm in my real life, and nothing makes me happier than hearing a nine-cylinder Pratt & Whitney radial going over my fields in the spring. So—and that and the stuff—the airplanes don't drive me crazy, it is the sirens all night

long here in town. So—but I am not used to that. So, anyway, keep hanging in there.

But for Mr. Epstein, I met you in California there. And so much of the aerospace has left the State. And primarily—you know, there was a downturn in the economy, but also they are showing up in other States. So can you reflect a little bit on what you have seen with the regulatory load in the State of California that has caused—I think your last facility, you know, had pulled out a couple years ago that was making the auxiliary power units for aircraft. And what made California less competitive elsewhere, and what lesson can we learn that doesn't completely chase the industry out of the country, which—I sure hope that we can maintain domestically built aircraft and all its related components.

Dr. EPSTEIN. Well, the engine business is more constrained in size in the aircraft certification. So the engine directorate is based in Burlington, Massachusetts. And we almost exclusively deal with them, as opposed to the aircraft directorate, which is more broadly based around the country, including Los Angeles. So I can't really comment on that.

UTC has very extensive facilities, I think 140 acres in San Diego on the waterfront, where we are, I believe, the world's oldest manufacturer of nacelles, and continue to do that. The APU business was moved within UTC from UTC aerospace systems, which is when it was in San Diego, to Pratt & Whitney. And it was essentially—it was a very small facility. And so it was moved to——

Mr. LAMALFA. Don't take me wrong, sir. I am not faulting you for your business decisions that may or may not be made. I am just—in general, if you are finding an atmosphere of regulation that is not conducive, whether it is California, anywhere. I mean what lessons can we apply from what you or some of your colleagues have had to do on trying to find a more friendly place of doing business, and what could we apply towards national policy we would make here?

Dr. EPSTEIN. The engine directorate is, I think, a jewel for this country. And I think what we can do as a policy issue is make sure that in any FAA reorganization its deep expertise in the peculiar requirements of the engine business not be diluted or otherwise lost.

The organizational development authority was a step forward, and I think the certify design organization, which Mr. Hamilton mentioned, is another process by which there is more delegation to qualified industry, reducing the load on the FAA, and allowing industry to be more flexible. And then we would be more aligned with the European regulators, and, in particular, the flexibility they give to European manufacturers.

Mr. LAMALFA. So flexibility from FAA would be pretty key.

Dr. EPSTEIN. Oh, it always has been.

Mr. LAMALFA. Mr. Hamilton, do you care to touch on that, as well?

Mr. HAMILTON. Well, again, I think it is how do you best use the total resources that are available around certification, whether they are in the industry or whether they are at the FAA. And I think we have got to constantly look at how to best efficiently use those limited resources, given the production rates are going up,

given that there is development programs going on constantly. We are doing a lot more certification work than we have ever done before.

With respect to California, sir, though, I just want to, you know, for the record just state we are very proud of the folks that we have in California that continue to support and to do design work in California to fly airplanes.

Mr. LAMALFA. I appreciate you hanging in there. It is a hard State to do anything in, so I know you are trying.

Real quickly, a one-liner, Ms. Gilligan. We have a situation in an airport up my district, the Tulelake Airport, which has been required to do a perimeter fence as per safety regulations. It has been running into some issues with that. I would just like to ask if you could look into that, please, and help expedite, so that the airport people know what to do and how to complete that for their safety requirements.

Ms. GILLIGAN. Certainly, Congressman. I will take that request back to our Associate Administrator for Airports, and make sure that they are focused on that issue.

Mr. LAMALFA. Thank you so much.

Ms. GILLIGAN. Thank you.

Mr. MITCHELL. The Chair now recognizes Mr. Rokita for 5 minutes.

Mr. ROKITA. I thank the chair and I thank the witnesses for their testimony. Apologies, I was in another hearing and just got here recently, but wanted to have maybe what would be some followup questions with regard to what was said and asked earlier on today.

Ms. Gilligan or Ms. Baker, with regard to the part 23 rewrite, I am reading your testimony and I see that it is going pretty good, in your view, and it seems that industry is basically saying the same thing. And I am reading in your testimony where you describe how you are now taking the part 23 rewrite not just to new design sheets of aircraft, but to equipment, avionics and such. You mentioned in your testimony that you are focused on equipment that actually improves the safety, especially in general aviation aircraft, and that is fair.

But then you talk about a prototype you are working with industry on in bringing that—the same rewrite features to avionics that are just generally better. And by better, you intuitively also get safer, right?

So my question would be how is this prototype program going? What results can we see, and when? And how do you define what category of avionics you are going to focus on next?

Ms. GILLIGAN. So, Congressman, let me start and I will ask Dorenda to give you more detail. But I think you are familiar with the efforts that we have had so far have been to enable what we call nonrequired safety equipment to be able to be installed. Because it is not required, it is a much lower level of certification or certitude. But it is to give pilots situational awareness. The new prototype is looking at how can we streamline the process for certified systems to be able to get those into general aviation at a lower price point.

Mr. ROKITA. Oh, so you are not even in the certified space yet. You are—certified space as it regards that angle of attack indicator, but you haven't moved beyond that in the certified world?

Ms. GILLIGAN. Well, we have. So let me ask Dorenda to give you the details.

Mr. ROKITA. Thank you.

Ms. GILLIGAN. Because, as you know, it always gets complicated.

Ms. BAKER. What we are trying to do is to find out, again, back to that safety continuum, how much rigor needs to be applied. She mentioned the nonrequired safety-enhancing equipment, and we recognized that we were applying too much rigor to equipment that wasn't even required. So we wanted to get that into the aircraft as quickly as possible, because it is very important for loss of control and controlled flight into terrain to give the pilots a situational awareness.

Things that we are looking into now is scaling the production of those appliances and parts, because it makes a difference on how much scrutiny they undergo in the production of the part. And I think it has been mentioned before. And Michael might even have some first-hand knowledge of some of the things that we are doing, along with the General Aviation Manufacturers Association and the Experimental Aircraft Association, one representing people who want to fly these, and the other the manufacturers that have the higher end equipment. But we are coming together and finding ways that we can work both parts of the industry, such that we can come up with a good solution for both——

Mr. ROKITA. Are you finding tension in the manufacturing world between those that went through the process under the legacy certification processes, and therefore invested a lot of money, and they need a return on that investment—that is how you hire people and stay in business—versus this new way of doing things? Is there that tension? And how are you resolving it as the Government referee, so to speak?

Ms. GILLIGAN. Yes. Well, actually, it is interesting, you are right. There was tension because there were—one, not because I did it and I had to go through the hard process, but more that we know that the process that we have today provides a safe product, and we don't want the reputation of the industry degraded.

And so, instead of being a referee, I actually asked them, "Why don't you guys go sort it out together and find an area where you both agree that it is beneficial for both?" And they came back to us with some proposals, which were very helpful.

Mr. ROKITA. OK. So I am always a little bit schizophrenic when I see the word "prototype" coming from an agency, because on one hand it looks like you are thinking outside the box, and that is wonderful, but then it also means that it is a prototype, which means it may always be a prototype.

When do we go full-scale with this kind of thinking?

Ms. GILLIGAN. We are actually seeing results today. What we continue to do is just keep pushing it. I know we call them prototypes, but it is really kind of the entrance of the things that we are doing——

Mr. ROKITA. Pushing it, when can I see that this works, and that you guys are embracing this less rigorous kind of situation because it is not needed——

Ms. GILLIGAN. Again, I think you already should see results from, like, the angle of attack indicator and some of the things that——

Mr. ROKITA. No, no, no, I see results, but when are we full scale? You are in prototype mode. When are we going to make this the practice.

Ms. GILLIGAN. It is the practice.

Mr. ROKITA. OK.

Ms. GILLIGAN. We are still trying to assure that we have got the checks and balances that are in place to make sure that we don't go too far.

Mr. ROKITA. You are talking out——

Ms. GILLIGAN. That is what I——

Mr. ROKITA. You are saying two different things to me.

Ms. GILLIGAN. I know, I know. But what I wanted to share is why we call it prototype is in one case we went—what industry felt we went too far. We issued something that everybody was very, very excited about. But, in retrospect, we realized that that was maybe just a little bit too far out of the box, so we scaled back. So we are pushing forward, but in some cases we do need to reassess what we did and whether or not that pushed the envelope beyond what was acceptable to industry.

Mr. ROKITA. So I am going to ask a question on the record for you to follow up with. I just—perhaps because I missed some of the hearing, and I apologize again—I would like more detail on that pushback so I understand the issue better.

Ms. GILLIGAN. It would be great to talk to you privately on that. So that would be——

Mr. ROKITA. No, could you just——

Ms. GILLIGAN. In the record?

Mr. ROKITA [continuing]. Send me a letter? Yes.

Ms. GILLIGAN. OK.

Mr. ROKITA. Yes. Thank you.

Ms. GILLIGAN. OK, will do.

Mr. MITCHELL. Thank you. The Chair recognizes Mr. Meadows for 5 minutes.

Mr. MEADOWS. Thank you, Mr. Chairman, and thank each of you—Ms. Gilligan, and thank you for your service, and congratulations on your upcoming retirement. And so I am not going to ask a bunch of detailed questions. I would like to make two comments.

One is with regards to the implementation of NextGen. If you will carry the message back is that we continue to have hearing after hearing after hearing with no specificity in terms of benchmarks and how we are going to accomplish it, other than the request for more money. And so, in doing that, I looked into it in a much more detailed way than ever before, and it is too segmented to actually, at this point, have any real results, even though you may mention that it is having great results in Hartsfield-Jackson Atlanta International Airport, perhaps not as much in Charlotte, North Carolina.

And so, when we look at those, if you would carry that back, that it is critically important that we have more defined benchmarks and, really, timetables as it relates to some of the implementation. Talking to some of your folks, it seems like we are moving some of the money from NextGen into other areas of FAA that would actually, in my mind, be a problem from an appropriator's standpoint. And I am not making an accusation, I am just saying if you would ask them to look at that.

And Ms. Baker, let me come to you. Because what Mr. Rokita was just talking about, it is critically important, from a certification standpoint and a general aviation standpoint, that we get it right. So what I would like for you to do is give this committee five recommendations on how we can get the Government out of that and allow the certification process to go in a more streamlined and expeditious manner, so that we are not going back and forth on the timelines that he is talking about with prototypes and what is success and what is not success.

So could both of you do that?

Ms. GILLIGAN. Yes, sir.

Mr. MEADOWS. Ms. Baker?

Ms. BAKER. Absolutely. And we didn't get a chance to make a plug for our blueprint. We are working on a blueprint which will provide a lot of recommendations, and we are doing that in collaboration with industry.

Mr. MEADOWS. All right. Mr. Chairman, I yield back.

Mr. MITCHELL. Thank you very much. The Chair recognizes Ms. Lawrence for 5 minutes.

Mrs. LAWRENCE. Thank you, Mr. Chair. I am sure that everyone in this room will agree when I state that in today's global economy, a modern transportation infrastructure network is critical. I represent the 14th District of Michigan. My district directly employs over 25,000 employees in manufacturing, and tens of thousands indirectly. The aerospace manufacturing industry directly employs more than 200 employees in my district, and 1,000 more through indirect partnerships.

So my question is for Ms. Gilligan. While we discuss the current state of civil aviation manufacturing, including the regulatory and the general health of the industry, I want to talk about the workforce of the industry. FAA's primary mission is ensuring aviation safety. The more than 14,000 FAA air traffic control specialists do a great public service.

So my question is, while FAA works through this surge in the hiring process, I want to know if your agency has the capacity and infrastructure in place to train these new works. How are you managing this surge in hiring? And what are the challenges you currently face?

Ms. GILLIGAN. Congresswoman, I can provide you some of those details, although I am not responsible for the air traffic service provision, and we can get you additional details.

But I can tell you that FAA has planned for the hiring surge, and they have continued to hire, even while we are under the continuing resolution, for example, and through these early months of the new administration. We have been authorized to continue to hire air traffic controllers, as well as other safety technical special-

ties, and that hiring continues. We have a training facility down in Oklahoma City. Those classes are prescheduled, and they are filled, and we will be able to continue to meet the hiring requirements for this year.

Mrs. LAWRENCE. With that being said, Mr. Epstein, in your written statement you mention the demand for the next generation of aerospace engineers. I cochair the Congressional Investment in America's Skilled Workforce Caucus, and our mission is to scale up the American workforce. Can you elaborate on the need for a skilled workforce in this critical aerospace industry, as well as in U.S. manufacturing?

Dr. EPSTEIN. Yes. The aerospace industry in particular has a bimodal age distribution, where there is a large cohort close to retirement with vast skills, a hole reflecting lack of hiring for decades——

Mrs. LAWRENCE. Yes.

Dr. EPSTEIN [continuing]. And then a group of enthusiastic young people. This extends from the more technical aspects of aerospace engineering, which is working with universities, but also to trained workers on the factory floor, who are just as important.

And so, you will see that the industry is starting—which has long worked with universities around the country, as has the FAA and NASA, in terms of fostering engineering education—is now working with the community colleges to increase training available—and encourage young people.

Aerospace is so successful in the U.S. because we have had some of the best engineers the world has ever seen build up our capacity. If we can't get the same quality of both——

Mrs. LAWRENCE. Yes.

Dr. EPSTEIN [continuing]. Engineers and manufacturing workers to go into this business, we won't have the same future that we have had in the past. So industry is critically focused on this, because we really are our people.

Mrs. LAWRENCE. Thank you.

Mr. Hamilton, can you comment on what Boeing's effort is to invest in the skilled trade workforce, please?

Mr. HAMILTON. Thank you. Yes. So the bimodal distribution of aerospace workers, I think we have been talking about that since I was on the early bimodal stage back 32 years ago. It exists, and we do have retirements. But luckily, people space out their retirements.

Some of the STEM activities that are in efforts across the country, I think, are very effective. I think we are seeing a lot more interest in engineering, in the sciences and technologies, from women, from very diverse populations, and it is great. And I will tell you that the younger workforce that we are bringing in is highly capable. And I am excited for them, because I think when I look at what they are capable of doing——

Mrs. LAWRENCE. Yes.

Mr. HAMILTON [continuing]. I think they will carry on.

Mrs. LAWRENCE. I just want to close with this. We recognize that the average age of a skilled trade worker is 53. We do have a gap, and it is very encouraging to hear that you understand it has to be a partnership between the industry who is producing the jobs

and have the need for the skilled workforce, and for us in Government to support that and nurture that, and for these community colleges.

So thank you so much, and I yield back, sir.

Mr. MITCHELL. Thank you very much. The Chair recognizes Mr. Woodall for 5 minutes.

Mr. WOODALL. Thank you, Chairman Mitchell. I appreciate that and I appreciate you all spending an extended morning with us.

Dr. Epstein, I particularly appreciate your mentioning Columbus, Georgia, and your work down there. Mr. Thacker has some work going on in Columbus, Georgia, as well. But when you spend an extra $300 million to put in more capacity, when you recognize that you have an incredibly talented workforce, an incredibly robust training system as we have there in Columbus State, it means a lot to us in the community, and I appreciate you recognizing that for the entire panel today.

My question is actually for our panel member that we won't have back here again. Ms. Gilligan, leadership is hard. Being an agent of change is hard. Setting expectations, as the article I branch of the article II branch, is hard. Help me to set my expectations. When you have a leadership change, as we will soon have, should I expect the reforms we have talked about today to be employed more rapidly because folks are not invested in the status quo, they are able to get out there and lead, make all their mistakes in the first 90 days? Or should I expect things to be much slower than if we had a continued and steadied hand on the till?

Ms. GILLIGAN. I think you can expect that things will continue to move along the plans and programs that we have established with industry. So, as Ms. Baker mentioned, we have agreements with our industry of what we will do and when we will do it on both sides, what we will do as the FAA and what they must do in order to meet their responsibilities and be accountable, as well.

I have a very strong management team in the aviation safety organization, and we have strong support from the Administrator, who continues his 5-year term until next January. I don't expect you will see a ripple in our continued success in this area. Very much as they describe it, it will be like the fist in the bucket of water. It will fill the space quickly, and I think you will see that we are committed to these improvements, and we will continue to work with industry to accomplish what we have committed to do.

Mr. WOODALL. Can I ask that question of our industry witnesses, too? Depends on which poll you look at. Are folks optimistic about the future? Do they have anxiety about the future? Certainly we have a big leadership change going on, haven't had one like this in 8 years. What is industry going to tell me?

Do you share Ms. Gilligan's confidence that it is just going to be the fist in the bucket of water and you won't likely detect any ripple at all? Or, is there real opportunity to either get this right or get this wrong as the new administration takes over?

Mr. Thacker?

Mr. THACKER. I would be happy to comment on that. I do think that the actions that are in place give us the opportunity to carry the momentum forward. But I do think it is important that this committee and Congress overall continue to provide the support

and impetus to make sure that we carry them forward to conclusion.

And the articles that were in the proposed bills last year provided a great framework for us to be able to move forward, and we would like to see those same sorts of proposals put on the table this year, and put into the reauthorization act.

Mr. WOODALL. The Boeing nod of approval there?

Mr. HAMILTON. I echo those comments, as well.

Mr. WOODALL. All right. And the largest employer on the panel from the great State of Georgia? Dr. Epstein, is that also a nod of approval?

Dr. EPSTEIN. It is, indeed, sir.

Mr. WOODALL. Well, I am very grateful to you for being here today and, again, spending the morning and now into the afternoon with us.

So, Mr. Chairman, I yield back.

Mr. MITCHELL. Thank you very much. The Chair recognizes Mr. Larsen for a couple of questions.

Mr. LARSEN. Thanks. Mr. Thacker, just to—for the record, the greatest—what would—what changes would have the greatest effect in the shortest amount of time, from Textron Aviation's perspective, at the FAA?

Mr. THACKER. So again, from an impact standpoint, full utilization of the designations that we already have in place is the fastest path to be able to make a difference for us and for the FAA. Beyond that, to carry forward the philosophy that has been put in place with the part 23 rewrite, and take that philosophy, albeit maybe not in exactly the same manner, forward into part 25 and other parts applicable to other aircraft categories would be a great move forward, in terms of streamlining the overall regulations to make the entire process less prescriptive and more appropriate.

Mr. LARSEN. OK, thanks. And I will get the honor of asking your last question in front of this committee. And it is going to be easy. All I want is—you don't even have to answer it.

I just want to request that you all prepare a briefing for us to look at the consistency of the application of certification and regulation from region to region within the FAA. That is one of the issues we discussed a couple years ago, and I wanted to get an update on that, what we were doing to train and retrain folks so that folks aren't forum-shopping, if you will, for the best deal.

Ms. GILLIGAN. Thank you, sir. Ms. Baker will be glad to present and prepare that for you. And it very much feeds in to the air transformation that we have underway. Much of what drives that decision is to make sure we can provide consistent guidance and application of the standard. So thank you very much.

Mr. LARSEN. Great. Thanks a lot. Thanks.

Thanks, Mr. Chairman.

Mr. MITCHELL. If there are no further witnesses or questions today, I want to thank the witnesses for their testimony and their time.

I want to wish Ms. Gilligan all the best in retirement. I tried that; look what happened.

[Laughter.]

Mr. MITCHELL. And I thank the Members for their participation.

This subcommittee stands adjourned.
[Whereupon, at 12:14 p.m., the subcommittee was adjourned.]

STATEMENT OF MARGARET GILLIGAN, ASSOCIATE ADMINISTRATOR FOR AVIATION SAFETY, FEDERAL AVIATION ADMINISTRATION, BEFORE THE COMMITTEE ON TRANSPORTATION AND INFRASTRUCTURE, SUBCOMMITTEE ON AVIATION, ON BUILDING A 21ST CENTURY INFRASTRUCTURE FOR AMERICA: STATE OF AMERICAN AVIATION MANUFACTURING, FEBRUARY 15, 2017.

Chairman LoBiondo, Congressman Larsen, Members of the Committee:

Introduction

Thank you for the opportunity to appear before the Subcommittee on Aviation. I look forward to providing you with updates on our progress since the last time we testified before you about the aviation manufacturing industry. As you will see, even though the system and its components have become increasingly more complex, working together with industry and this subcommittee, we nevertheless have been able to raise the safety bar.

As my career in federal service draws to a close, I look back with pride and a great sense of accomplishment knowing how far we have come. I would be remiss not to mention the role you and this subcommittee have played, Mr. Chairman, in helping us operate and maintain what has become the world standard for safety and efficiency. Government needs to be a catalyst for innovation; we cannot put industry in the place where it must sit on its hands while the bureaucracy catches up. Thankfully, that is not the case.

Two years ago, we appeared before this committee to update you on Section 312 of the FAA Modernization and Reform Act of 2012. We made commitments, and today we come before this subcommittee having kept those commitments. We have accomplished much, and in fact, have moved well beyond what this committee contemplated as we strengthen our efforts to work with industry. The bottom line for Section 312—indeed, the entire FAA Modernization and Reform Act—is that the Federal Aviation Administration (FAA) needs to work more closely with

industry. We are, and I would like to highlight briefly a few examples.

Keeping Our Commitments

We set the policy for expanding delegation to companies regarding the processes by which aircraft are maintained. We expanded the framework to delegate noise and emissions compliance findings. We eliminated the delay in certification project initiation by developing a new resource management process. We've also created a new training program to minimize subjectiveness in our audits of industry.

We are also taking steps to allow applicants that have demonstrated a history of technical competency in certain aspects of a certification program to be allowed to work through certification approvals without a specific finding by the FAA. This policy gives applicants greater control over their business schedules and highlights their responsibility to design and produce safe compliant products.

When the FAA testified before you in 2015, we highlighted an initiative where under specified conditions the FAA and EASA would accept each other's approvals without further review. We concluded the agreement with EASA in 2016, thereby reducing time to market and fees associated with validation of the approvals by EASA. We have also reached an agreement with Transport Canada Civil Aviation for similar improvements and savings in time. We are looking to expand this agreement with Brazil. With these agreements, parts made by U.S. manufacturers move more quickly and easily in international commerce.

AIR Transformation

The FAA Modernization and Reform Act highlighted the need for government to work better and smarter. As part of our commitment to keep pace with industry, we are transforming our

Aircraft Certification Service. As you know, the Aircraft Certification Service (AIR) works to continuously improve within today's dynamic aviation environment, which is heavily characterized by change. Aviation products are designed and produced in locations around the world, and an international web of networks and complex business arrangements challenge AIR's traditional regulatory model. Technological advances and business model changes are precipitating higher rates of change and increasing the need for organizational agility as the environment shifts. The industry is both expanding and contracting much faster than the FAA can ever respond. Meanwhile, the expectations of industry, government and the flying public continue to increase, demanding we do things faster—and with greater levels of safety.

The FAA Modernization and Reform Act section 312 sought to review and reform the certification process and make it more nimble, but we are moving beyond simple reform to transformation.

To meet these demands AIR is undergoing a transformation focused on 3 goals:

- Refresh the certification strategy,
- Invest in management systems to improve performance, and
- Improve our organization and invest in our people.

Refreshing the certification strategy means FAA will take a systems approach, relying on industry's processes and competencies based on risk management. This minimizes our involvement along the certification path to those areas of higher risk.

We cannot move to managing risk unless we have systems that will focus on the use of data. Information technology will allow us to adjust our level of involvement based on risk, and assign our resources accordingly.

Investing in our people is the most important aspect of our ability to improve the organization.

Our geographically based approach was established in the early 80's and was organized around the products we certify. Over the last 40 years, the industry's expansion and diversification has made that structure outdated and unable to keep up with rapidly changing global market. By moving to an organization built around the functions we perform we will better match industry's demands and global needs. Our emphasis will be placed on up front planning on new technologies with industry, development of reusable compliance techniques adaptable to industry and a shared risk-based oversight program with industry.

As we work with industry to implement our transformation, we must establish metrics to measure our success. AIR recently created a new Organizational Performance Division that will oversee our roadmap to transformation, tracking outcomes expected by both FAA and industry. The new division will establish with industry agreed upon metrics and effectiveness measures for both FAA and industry. Then we will hold each other accountable to meeting these metrics. We encourage you to visit our AIR Transformation webpage (www.faa.gov/go/AIRTransformation) to obtain regular updates.

Industry Collaboration

Safety is a shared responsibility, not a solitary journey. The last foundational element in our strategy recognizes that successful transformation requires 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 to improve both FAA and company performance.

Working with industry, and leveraging the expertise that resides in the aviation community, continues to be advantageous to us both. In 2013, the International Civil Aviation Organization (ICAO) established a requirement for organizations that design and manufacture aircraft to have a Safety Management System (SMS). U.S. companies, looking to remain competitive on the

global market, wanted a way to be recognized as having an SMS to meet the ICAO requirement. The FAA turned to industry to develop a standard that met the requirements of ICAO Annex 19. A government-industry team under the auspices of the Aerospace Industries Association and the General Aviation Manufacturers Association collaborated and published National Aerospace Standard 9927 on May 31, 2016. Less than a month later, the FAA determined the standard to be consistent with our SMS regulation and that it could be used as a voluntary means to satisfy the ICAO SMS requirement. We have developed a process to accept applications from companies that seek recognition for their design and manufacturing systems. This is just one more example of where the agency and industry are striving to reform and streamline certification in a global market.

We've also been successful working with industry to address the environmental impact of leaded fuels. Thanks to Congressional support, FAA and industry established the Piston Aviation Fuels Initiative (PAFI). Under that initiative, the FAA has made significant progress in qualifying and testing potential unleaded fuels for general aviation use. But that is just the first step. FAA will need continued Congressional support to streamline the process to approve the use of the new fuels in the more than 160,000 general aviation aircraft. We are working with aircraft and engine manufacturers, fuel producers, the Environmental Protection Agency (EPA) and industry associations to overcome technical and logistical challenges to ensure the supply of aviation gasoline is not interrupted.

Congress, particularly this committee, has shown unwavering support to our effort to streamline certification of small aircraft by rewriting Part 23 of our regulations. A major endeavor in conjunction with our Part 23 revision is streamlining the cost and timelines associated with getting safety enhancing equipment into the general aviation cockpit. We are trying to "right size" the level of certification rigor, based on the overall risk posed by the new technology, balanced by the potential safety enhancement introduced. We have certified angle of attack equipment allowing the use of an industry-developed standard. This technology helps address

loss of control, which is the most prevalent accident category in general aviation. We've gone on to streamline the process of installing other non-required safety enhancing equipment (or NORSEE) in the general aviation cockpit. Now we are beginning a prototype program with industry that looks at replacing required equipment with more modern equipment with better, safer features. As we gain more experience in weighing risk and safety value, we will rely more and more on industry to help identify the next technology that will enhance general aviation safety and save lives.

Measuring Success

We are taking steps to measure the success of our efforts to work with industry. In 2015, FAA worked with industry and developed a set of metrics aimed at measuring the overall performance and health of the Organization Designation Authorization system called ODA. The objectives were to define mutually agreed measures, identify areas that were in need of greater focus and identify issues and concerns with respect to FAA and ODA holders' performance. In collaboration with industry, the FAA initiated an ODA Scorecard Prototype to resolve implementation issues and obtain data to support implementation of the metrics nationwide. Twenty four companies participated in this pilot project, which was concluded in December 2015.

The results of the ODA Scorecard indicated that the initiative was successful. Privately and publicly, industry leaders endorse this approach. Our industry stakeholders agree that this is the right thing to do and the right way to do it. Over 80% of participants indicated they experienced value in the pilot and recognized the greater potential the scorecard could present to all stakeholders. With overwhelming support and encouragement from industry, the FAA implemented the metrics nationwide for 84 ODAs with type certificate and supplemental type certificate approval authorization in 2016.

National rollup of the Scorecard data demonstrates that FAA and industry are successfully working together to meet each other's needs. We are also identifying actions to improve how we work together. For example, over 75 percent of the companies rated the FAA as "green," or "meeting their expectations," and the trend is improving. Over 75 percent of the companies were also rated "green" by their overseeing Aircraft Certification Office, and the trend is improving there as well.

Together, we have identified areas in which additional work is needed and have developed joint action plans to improve those areas. In 2016, we completed 97 percent of the local joint action plans from the 2015 Prototype. We have chartered a joint ODA Metrics FAA-Industry Certification Improvement Team to move this initiative forward. The team's goal is to improve the reliability and accuracy of indicators. That, in turn, will help decrease the involvement of the FAA in lower risk areas and maintain industry's compliance expectation.

The ODA Scorecard is both a tool and a process to help the FAA and industry institutionalize how we improve our relationships at the local and the national level. Going forward, it is important to keep an open, constructive dialogue to be successful in this common effort. Industry and FAA need to work together to improve the product approval processes and define the timing for transition to more advanced methods of product approval.

International

As you know, our efforts to partner with industry must acknowledge the nature of the global marketplace. To that end, we continue to work toward an improved validation process, placing greater reliance on the certification systems of our bilateral partners. These improved processes are beneficial to the FAA and our international partners such as EASA when streamlining the acceptance of repairs, parts and modifications to aircraft through supplemental type certificates. Reliance on these types of agreements with emerging aviation authorities requires an up-front

investment to be successful and allow U.S. industry to succeed in the global marketplace. This translates directly to enhancing the safety of the flying public.

We would also like to extend this reciprocal approach to the approval and use of foreign state-of-design continued operational safety information. As the state-of-design for U.S. manufacturers, we issue Airworthiness Directives (ADs) when there is an unsafe condition on a U.S. product. Many foreign countries that own or operate U.S. products use our ADs and immediately adopt the corrective methodology that they describe. As the certifying authority, we work with the manufacturer to develop the corrections for the unsafe conditions and have the best information to assess the risk, the corrective action, and proper timeline for implementation. The foreign equivalent of our AD is a mandatory continued airworthiness information (MCAI), from a foreign State of Design. Just as we have the best insight into the continued safety of our products, foreign manufacturers and their certifying authorities have the best technical knowledge of their products and how to maintain the intended level of safety. Unfortunately, our rulemaking process makes it impossible for us to simply adopt corrective actions from other aviation authorities, like EASA. Instead, we have to conduct repetitive assessments and issue our own corrective action. This repetition costs FAA time and money that could be working on the next safety issue for the U.S. fleet. It also delays the implementation of the safety fix, resulting in a U.S.-operated foreign product that could be less safe than the same product operated by foreign users. Allowing the FAA to leverage the work done by a competent foreign authority would result in a safer global aviation system.

The industry is changing rapidly, and the threats that face it are evolving equally quickly. To counter one such threat, we are working with industry on cyber security. We have taken allegations of successful cyber vulnerabilities to civil aircraft very seriously.

Since 2005, we have been addressing cyber vulnerabilities during the design and certification process using two Special Conditions. These Special Conditions, which carry the weight of

regulations, were first applied to the Boeing 787 program. The 787 was the first "e-enabled" aircraft, meaning that it had internet protocol-based (IP-based) systems that are accessible from within the airplane and externally. Our two Special Conditions focused on those access points, both inside and outside the aircraft. Since the certification of the 787, these Special Conditions have been applied to other certification programs, as well as to aircraft that are being updated to add passenger features, like internet access and Wi-Fi.

Realizing that we potentially needed more protection for important aircraft systems, the FAA tasked the Aviation Rulemaking Advisory Committee (ARAC) to form a working group to provide recommendations on cybersecurity. ARAC answered our request and the Aircraft Systems Information Security and Protection (ASISP) working group was formed in 2015. The working group membership was comprised of a wide range of domestic and international industry and government experts. We also invited three international aviation authorities to be observers—Transport Canada, EASA, and ANAC, the Brazilian authority. The working group delivered its report to the ARAC in mid-September and the ARAC forwarded it to us in early October.

There are 30 recommendations that range from rulemaking to developing best practices. The recommendations were aimed at the full spectrum of civil aviation products—from transport aircraft to general aviation aircraft to engines. We will take the working group's recommendations and work together to establish an internationally harmonized basis to protect civil aircraft from cyber vulnerabilities. We need to work as one to establish a set of common requirements that can be institutionalized globally, so that aircraft designers and operators are confident that their aircraft are protected in domestic and foreign airspace.

We also intend to engage ICAO and its membership to help inform a regulatory framework for cyber protection. ICAO provides a unique ability to leverage foreign expertise and an invaluable forum that fosters international acceptance. We are sending a delegation to Montreal later this

month to initiate this effort. Cybersecurity of civil aircraft is a priority for us.

Conclusion

We have been diligent in our efforts to address what is at the heart of your direction: that the system be responsive, flexible and safe. We are making sure that our own organization is among the first to adapt to the new world market. AIR is transforming to improve its efficacy to meet the needs of industry while advancing the FAA's mission to provide the safest, most efficient aerospace system in the world. As a result, to respond to the drivers of change, we are moving forward with a *comprehensive* approach to increasing efficiency and effectiveness, known as AIR Transformation.

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

QUESTIONS FOR THE RECORD FROM THE HOUSE OF REPRESENTATIVES COMMITTEE ON TRANSPORTATION AND INFRASTRUCTURE

HEARING ON
BUILDING A 21ST CENTURY INFRASTRUCTURE FOR AMERICA: STATE OF AMERICAN AVIATION MANUFACTURING
WEDNESDAY, FEBRUARY 15, 2017

Question for Ms. Peggy Gilligan, Associate Administrator for Aviation Safety, Federal Aviation Administration

From Ranking Member DeFazio Submitted On Behalf Of Congressman Andre Carson:

QUESTION, Congressman Carson: There have been many concerns raised about legislative proposals to privatize the FAA's air traffic control (ATC) system. We understand that the FAA's Aviation Safety Office, including its certification offices, is connected intricately to the Air Traffic Organization (ATO) and the NextGen side of the agency. Please explain how the work of the FAA's Aviation Safety Office, NextGen office, and other safety offices, is connected to ATO.

RESPONSE: The Aviation Safety Organization works closely with the NextGen organization and the Air Traffic Organization to assure the level of safety we enjoy in today's National Airspace System. From evaluating the airspace that is protected for safe departures and arrivals, to certification of aircraft systems to assure interoperability between the aircraft and the air traffic system, to establishing pilot training and testing requirements to assure airmen understand and operate safely in the airspace – the interconnections between the organizations are varied and complex.

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United Technologies

Statement of
Alan H. Epstein
Vice President, Technology and Environment
Pratt & Whitney

before the

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

Mr. Chairman and members of the subcommittee, I am Alan Epstein, Vice President of Technology and Environment at Pratt & Whitney (P&W), this country's foremost manufacturer of aircraft engines with over 75,000 engines in the field. We have been making innovative airplane engines for over 90 years under the slogan "Dependable Engines." Pratt & Whitney is part of United Technologies Corporation (UTC), a global technology corporation with a long history of pioneering innovation in aviation, climate control, safety and security systems, and elevators. We are a company focused on manufacturing and servicing what we manufacture. Our approach is to seek advantage through technical innovation across the value chain.

I am here to speak on the state of American aviation manufacturing. My remarks come from the perspective of a supplier and maintainer of aircraft equipment, specifically engines. This is a very timely discussion because aerospace represents 10% of this country's manufacturing output and is America's largest manufacturing export, with a trade surplus of about $80B a year. While marquee aircraft make about half of this total – famous names such as Boeing, Cessna, Gulfstream, and Bell – the export of aircraft subsystems and components, such things as engines, nacelles, landing gear, generators, and avionics are of equal value. Many of these are made by United Technologies. Indeed, much of the subsystem content of the world's civil aircraft is American – even if the airplanes carry the name of European, Canadian, Brazilian, Japanese, or even Chinese companies.

American aviation manufacturing is about more than just dollars, it is also about jobs. About 1.7 million Americans are employed in this industry, and their pay is 44% higher than the national average at almost $93,000 per year.

This industry has done very well lately, with trade balance growing at a rate of about 7% per year. The success of American aviation manufacturing is a result of our investments and our people – people who drive innovation, quality, and productivity. It's about cutting edge technology combined with manufacturing prowess. This success also depends upon, to a perhaps unappreciated degree, effective industry-government

partnership. The continued, healthy growth of this American manufacturing industry is critically dependent on all of these factors.

The most recent surge in aircraft orders has a lot to do with a technical innovation introduced by Pratt & Whitney, the PurePower® Geared Turbofan™ (GTF) engine, which entered commercial service last year. Our investment in this technology totaled about $1B over 25 years. This first billion was needed to develop and demonstrate the technology. Now, GTF engines will be powering airplanes built on four continents. To make this happen, we are investing another $10B in product development and manufacturing. The GTF engine and the competitive response thus stimulated have resulted in the orders of more than 8,000 new aircraft with a list price over $800B. The sales success stems from the GTF engine's 16% reduction in fuel burn and three quarters reduction in noise footprint. For example, when the new, GTF-powered airplanes take off from New York's LaGuardia airport, about half a million fewer people will be impacted by noise.

The aforementioned improvements are the result of decades long investment in engine design technologies. In the aviation business, however, advanced technology for manufacturing is at least as important as it is for design. Manufacturing technologies are an enabler of design innovation but are also important for improving productivity and cost. Aviation is a business in which it may be easier to design a new product than to make it for a cost the market will accept, as many famous names in aviation have learned over the decades. Successful companies must aggressively pursue improvements in manufacturing. We are enthusiastic members of the National Network for Manufacturing Innovation sponsored by the National Institute of Standards and Technology (NIST) and are helped by additional DoD initiatives in this area, such as the Materials Affordability Initiative.

For Pratt & Whitney, the success of our engines means that we will be doubling production over the next few years, requiring significant investments in plants, machinery, and people. I would like to focus on the manufacturing aspects of this expansion. The plans we are executing are about more than just expansion – they are about bringing new technology and innovation to the manufacturing process. We are bringing moving engine assembly lines to our facilities in Connecticut and Florida, cryogenic machining to Maine, new powder metal and coating capabilities to New York, hybrid airfoil assembly to Michigan, and isothermal forging and additive manufacture to Georgia, to name a few.

People are an important part of this expansion. Pratt & Whitney plans to hire 25,000 people over the next decade to enable expansion and account for retirements. Aerospace industry demographics are such that the replacement of retiring workers and the retention of their specialized skills are a major concern. You can't make the best products if you don't have the best people. In response to this concern, Pratt & Whitney has partnered with universities across the nation to help foster the next generation of aerospace engineers. The historically strong NASA and the more recent FAA partnerships with American universities have been extremely important. Our workforce concerns also extend to the factory floor. We need a manufacturing workforce with 21st century skills. So, we support community colleges and trade schools to stimulate such

education for young people in states in which we operate, including Connecticut, Maine, New York, Georgia, Michigan, Pennsylvania, Texas, and Florida. If we believe as nation that aerospace manufacturing is important, then education of the future workforce must be a critical focus.

More than technology has changed since the days when the landmark Pratt-powered Boeing 747 entered service in 1970. In those days, we manufactured 80% of our engine content in-house and sourced 20% from our supply base. Now we make only 20% in-house and source 80%. Of the 80% we purchase, we buy 80% from over 500 direct U.S. suppliers. Thus, our concerns for innovation, for quality, for people extend to our supply base as well. This supply base is heavily strained at the moment as the industry expands production. This is a very capital-intensive business. Investments in infrastructure, equipment, and people are needed up and down the aviation supply chain. In addition to capacity, supplier quality is of particular concern to our industry. This is an area of intense industry focus now.

The federal government has important roles in keeping US aviation manufacturing healthy. Two that stand out are thoughtful, effective regulation and the seeding of innovative technology in both product design and manufacture. The relative strength and experience of the FAA as a regulator is an important competitive advantage for U.S. manufacturers. The FAA regulates the design, manufacture, and maintenance of aircraft to ensure the astonishing safety of civil aviation we have come to expect. To design, manufacture, and sell the very best aircraft, we need the very best regulators. Our ability to bring new products to market and to innovate in the design and manufacture of these aircraft requires timely response, mature judgment, and some degree of flexibility from regulators.

FAA production certification is necessary as we introduce new manufacturing technologies and new suppliers. As part of our manufacturing expansion for the GTF engine programs, Pratt & Whitney, working with the FAA Manufacturing Inspection District Office (MIDO), gained FAA Production Certification at new engine assembly sites. The FAA has also supported Pratt & Whitney in approval of many of our new GTF engine suppliers who provide safety-critical, prime reliable parts. Partnering with the FAA through its Organizational Designated Authority (ODA) System has proven extremely helpful in providing flexibility and effectively adding capacity. ODA for manufacturing approval works, and it works well. In 2016, Pratt & Whitney, with FAA MIDO approval, doubled its ODA members in support of the GTF engine manufacturing ramp up. We plan to expand this program for the next several years, consistent with production demands.

Most recently, the FAA has been proactive in reaching out to industry to explore the certification implications of new manufacturing technologies, such as additive manufacture.

As Benjamin Franklin said, "an investment in knowledge pays the best interest." So I think it appropriate to comment on new technology. As a technology stimulator, NASA sees its role as an initiator of new technology, but the FAA is the safety gatekeeper, and nothing is more important to new technology than safety. Both NASA

and the FAA fund universities and partner with industry to advance the state of the art in aviation design and manufacturing technologies. Over many decades, NASA and the FAA have been important partners in the advancement of American aviation. Progress here has been profound, with the result that commercial aircraft are the most efficient and safest form of transportation. The P&W geared turbofan engine may have had its initial technology parentage in partnership with NASA, but it was clear from the beginning that dialog with the FAA on the safety and certification of its new technologies was of prime importance. We are currently working with the FAA and NASA on even more advanced technologies to create value for airline customers and communities by further reducing fuel burn, emissions, and aircraft noise.

One of the most exciting developments in aviation in several decades is the new NASA X-plane initiative, which aims to demonstrate technology that may enable dramatically improved civil aircraft for the future. Both design and manufacturing technologies are included. Some of the approaches proposed present certification challenges, and these must be explored with the FAA. This seed research is far in advance of what industry can justifiably fund. Should it prove viable, industry will need to invest much larger sums to bring such airplanes and systems to market.

The FAA also advances aviation technology in areas within its scope of regard. For example the FAA's CLEEN (Continuous Lower Energy, Emissions and Noise) program aims to reduce noise and emissions in and around airports. Since concerns about noise are probably the largest impediment to the expansion of the U.S. air transportation system (and certainly a major cause of community complaints), this work can have profound impact on the aviation infrastructure of this country. From our observations, the FAA and NASA research programs are well coordinated.

One major concern for industry is the aging FAA certification workforce. The FAA's demographics are similar to that of the aviation industry as a whole. A lot of talent will be retiring over the next few years. To provide the support U.S. manufacturers need, the FAA must be properly funded and able to hire and train their replacements, preferably before the experts are gone. A strong, competent, flexible FAA is an important partner to U.S. industry.

The FAA, partnering with industry and trade associations, must also continue to progress delegation of responsibilities to certificate holders where practical, in order to enhance flexibility to meet its customer requirements, while not compromising aviation safety. Pratt & Whitney applauds and strongly supports the actions already deployed under the FAA Accountability Framework initiative and looks forward to teaming with the FAA under the AIR Transformation over the coming years.

Other nations recognize the strength American aviation manufacturing brings in both an economic and a strategic sense. During the same period that the U.S. dropped its investment in civil aeronautics research by 40%, the EU increased its investment by a factor of more than 10. Perhaps even more concerning, China, the newest entry to the commercial airplane business, has announced large levels of investment in civil aviation technology, both for airplanes and, most recently, billions for engines. The message here is

that while small, federal investment in civil aviation is a critically important component of this country's largest manufacturing export industry and must be protected and nurtured if we are to maintain our position. We need adequate funding for research and regulation.

Aviation manufacturing is alive and well in the United States. This industry is comprised of healthy businesses that plan to expand their output and employment across the country. There are challenges including a strained supply chain capacity and an aging workforce that must be addressed. Competition is fierce. Other countries realize the economic and strategic importance of civil aviation and are ramping up their investments. For the long term health of America's largest manufacturing export industry, it is important that we continue the public-private partnership that has served this country so well.

Thank you for permitting me to address this important topic on which I am so passionate.

Testimony of John Hamilton
Committee on Transportation and Infrastructure
Subcommittee on Aviation
U.S. House of Representatives
February 15, 2017

Chairman LoBiondo, Ranking Member Larsen, and members of the Committee, thank you for this opportunity to provide Boeing's perspective on the state of the commercial aerospace manufacturing sector and the policy challenges facing our business.

I am John Hamilton, Vice President of Engineering for Boeing Commercial Airplanes, and I am proud to be here today to represent the 148,000 Boeing employees design, build and certify the best aerospace products in the world.

My remarks this morning will focus on how industry, the Federal Aviation Administration, and Congress must continue to work together to meet the regulatory and international challenges facing the domestic U.S. aerospace manufacturing sector.

Before I address these important topics, I want to commend the Committee for the bipartisan reforms included in the last FAA Reauthorization proposal. The reforms included provisions to maximize the delegation of routine certification tasks, to transform the FAA workforce to meet the challenges of the 21st century, and to increase the FAA's international engagement. Together these actions would give the FAA the tools needed to provide the type of oversight required for safe and efficient certification of our products and services in an increasingly global regulatory framework. Today I would like to give additional context to why these reforms are needed, and why more must be done to ensure U.S. global competiveness and leadership in aerospace manufacturing.

But first I would like to briefly highlight Boeing's place in the U.S. and world economy. Boeing remains the nation's largest exporter, exporting $56.8 billion of products and services in 2015. Last year we delivered 748 commercial aircraft, with 80% of those sold overseas. We assemble all of our aircraft in the United States, and we are proud that 80% of our company's suppliers are here in the United States. We spend roughly $50 billion in the United States every year, far more than any other company that produces large commercial aircraft. We are proud to sell our American manufactured, American supplied products to all corners of the globe – which is why we have long supported trade policies and trade agreements that open markets, facilitate the movement of goods across borders, and level the international playing field.

If Congress and the new Administration want to support high tech, good-paying manufacturing jobs, then look no further than Boeing. More than 90% of the 148,000 people we employ directly are here in the United States. In addition, we support another 1.5 million U.S. jobs throughout our supply chain. It is critical to understand that the biggest markets for our products over the next 20 years are in Asia and the Middle East, and the competition we face is fierce. We very much need Congress and the new

Administration, including the FAA, to support our efforts to win in these markets. Tens of thousands U.S. jobs in our industry are literally at stake.

The FAA's role in this global competition is critical. Every new Boeing airplane type that is certified by the FAA must be validated by its foreign regulatory counterpart in every country to which we export a product. This process is not meant to be a re-certification. A validation should be just that – validating that the FAA conducted the type certificate work to the standards of the foreign regulatory authority in question. This process should be quick and efficient, but in some cases it can take upwards of 14 months.

To use our newest product offering as an example, the 737 MAX, we have orders from 83 different customers from 43 different countries. The FAA and Boeing must work with each of those foreign regulatory authorities to get approval to deliver our aircraft. This is a time consuming task and requires FAA resources and, more importantly, a strong working relationship between the FAA and foreign regulators.

The Aircraft Certification Service at the FAA cannot efficiently complete these critical validation activities without support from Congress and a commitment by FAA senior leadership to make this work a priority. Type certificate validation by other governments cannot be viewed as a secondary or lower priority function of the FAA. It is a critical priority for Boeing and for all US exporters in aerospace, and Congress must continue to support and prioritize these efforts too.

With respect to our day-to-day interactions with the FAA on certification activities, we have seen progress in efforts to streamline the process and hope that with continued partnership we will see continued progress. Dorenda Baker, the Director of the Aircraft Certification Service at the FAA, has embarked on an effort known as "Air Transformation" to reorganize and better align the Agency's activities with the strategic imperatives for certification in the coming years. This is a step in the right direction and is worthy of Congressional support and prioritization. This process, as it continues to unfold, must enable the FAA to shift resources to areas of greatest safety impact, including engagement with Europe and other regulatory authorities around the world. Doing so will help the FAA retain its global leadership status, and enable the United States to compete on a level playing field.

I want to stress that last point. The FAA must be a global leader in aircraft certification, and:

- adhere to risk-based oversight principles that focus the agency's resources on areas of highest risk,
- provide timely and consistent requirements to applicants,
- and fully support and promote U.S. exports of aerospace products and services.

This Committee has strongly supported these goals in the past, and I am privileged to be here today to discuss further ways in which we can advance these important issues. Thank you for the invitation, and I look forward to answering any questions you may have.

HOUSE TRANSPORTATION AND INFRASTRUCTURE COMMITTEE

SUBCOMMITTEE ON AVIATION

TESTIMONY OF:

MR. MICHAEL THACKER

SENIOR VICE PRESIDENT, ENGINEERING

TEXTRON AVIATION

"BUILDING A 21ST CENTURY INFRASTRUCTURE FOR AMERICA: STATE OF AMERICAN AVIATION MANUFACTURING"

WEDNESDAY, FEBRUARY 15, 2017

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

Thank you for inviting me to testify this morning on the state of American aviation manufacturing. My name is Michael Thacker, and I am Senior Vice President of Engineering for Textron Aviation. Textron Aviation is part of **TEXTRON INC**, a $13.8 billion multi-industry company with 36,000 employees.

TEXTRON AVIATION is home to the iconic Beechcraft, Cessna, and Hawker brands, and continues to lead general aviation through two principal lines of business: Aircraft sales and Aftermarket. Aircraft sales include business jet, turboprop, and piston aircraft, as well as special mission and military aircraft. Aftermarket includes commercial parts sales and maintenance, inspection, and repair services. Textron Aviation currently has more than 11,300 US employees throughout ten different states. We have manufacturing facilities in Wichita and Independence KS, Columbus, GA, and Mesa, AZ. We also operate ten Service Centers in seven other states.

Most, if not all, of you are familiar with the challenges faced by general and business aviation in the years since the economic downturn in 2008. Despite some positive signs during the interim, business conditions have not dramatically improved. Many jobs were lost that have not been regained, and some of the industry members have vanished or been absorbed by others. Despite the challenges, America remains the world leader in general and business aviation and the industry remains a great example of American technical leadership leading to a positive balance of trade.

Our vital industry, however, appreciates and needs the continued support of Congress to remain strong and grow in the future. Numerous obstacles to efficient business operations remain. One of which is regulatory burden across our business.

Textron Aviation has remained at the forefront of our industry through a commitment to innovation and new product development in both strong and weak economic environments. Due the nature of our business, the ability to rapidly field new and improved products is critical to financial performance and the ability to preserve and grow US jobs. The certification process represents a significant portion of new product development time and expense, and is consistently on the critical path to completion of new products and delivery into customers hands domestically and globally.

Textron Aviation appreciates the efforts being made by FAA leadership and the support of Congress for streamlining efforts. While some progress has been made, opportunities remain to consolidate the gains and capture the full benefits of the changes mandated by Congress and initiated by FAA leadership. For aircraft manufacturers, the key to success in the certification process is a clear path to compliance. This allows appropriate management of risk to cost and schedule. A clear path to compliance consists of three basic elements:

1) Clear and stable aircraft requirements – without these the ability to deliver to customers in a timely manner as promised remains at risk, in some cases until late in the process
2) Clear and consistent documentation expectations – without these the content and amount of documentation is also uncertain, but generally continues to increase; over the last 10 years the number of pages required to document certification of a similar scope program has increased ~2 to 10 fold for Textron Aviation
3) Consistent and appropriate level of involvement – the pace and diversity of industry can outpace FAA bandwidth to successfully engage in every detail of a project; the full use of the Organization Designation Authorization (ODA) program is a readily available resource to minimize this bottleneck

In some form, these key drivers are being addressed by current initiatives, but to date actions have not had a sufficient impact on working level actions. Some recent positive actions that merit attention are the release of Amendment 64 to FAR Part 23 and the on-going transformation of the certification organization.

Textron Aviation would like to thank Congress for passage of the Small Airplane Revitalization Act. The resulting public law, P.L. 113-53, encouraged the timely completion of the Part 23 re-write effort and led FAA to execute a process, with both industry and international regulatory involvement, that ensures a more uniform transition to this new and streamlined set of regulations. Industry should see near term benefits from the continuum of safety approach to product categorization and over time should see more rapid incorporation of safety and efficiency enhancing technologies through the more streamlined process of using industry standards to achieve consensus on new means of compliance.

With the transformation of the FAA certification organization, FAA leadership has stated the intent to:

- Encourage early industry engagement and risk-based monitoring to eliminate unnecessary FAA involvement in "critical path" during certification
- Improve consistency and standardization
- Foster innovation
- Provide agility and adaptability to meet the challenges of the dynamic global aviation industry
- Establish business practices for utilizing metrics for determining efficacy of Industry/FAA associated with compliance/safety and time to market

Textron Aviation applauds the intent and appreciates the strong outreach and collaboration with industry to refine the implementation plan. While the top level reorganization helps establish a vision, the implementation will determine if real and tangible results come from the change. Textron Aviation is pleased to be involved in these efforts and looks forward to continued engagement going forward. The real challenge will be ensuring that the message of this transformation makes its way throughout the entire organization especially in the case of fuller utilization of ODA and other delegation efforts. Additionally, while AIR Transformation intends to improve the overall certification process, it fails to include Flight Standards in the

transformation which can be a stumbling block to the pace of certification programs since approving flight manuals and instructions for continued airworthiness is done by Flight Standards. Overall, the goal of AIR transformation must be to ensure that FAA lowers unnecessary barriers to incorporating safety technologies by fully delegating and utilizing ODA's and driving consistency across disparate FAA organizations.

Both of these efforts move in a positive direction, but leave work to be done, and done in an expeditious manner. Like in the Part 23 effort, Congress can play an important role in working with FAA and industry to advance certification and regulatory reform. The certification titles contained in both your Committee-passed bill and the Senate-passed FAA Reauthorization would have provided an important framework and direction for these reform efforts. In particular, language that supported fuller utilization of ODA, improved validation and acceptance of products globally, reduced the inconsistent application of regulations by FAA, and furthered reforms in the Flight Service Standards Office at FAA is strongly supported by Textron and other aviation stakeholders. We were disappointed these reforms were not enacted in the 114th Congress. Passing them in an expeditious manner this year would benefit safety, innovation, jobs, and our nation's competitiveness. These changes, if enacted, will have an immediate and lasting impact.

The new Part 23 also establishes a continuum of safety for product categorization for small aircraft matching product requirements to performance measures, passenger risk and system risk. The same concept is applicable to other parts for larger aircraft and rotorcraft where a great diversity of products is held to a single standard that may not be appropriate for the risk represented by all of the products in a category. The same benefits touted for Part 23 of more rapid incorporation of safety and efficiency technologies could be expected by expanding this philosophy across all aircraft product categories (Parts 25, 27 and 29).

The certification organization transformation aligns the organization to enable improved consistency and to shift the focus from sub-element compliance to system oversight. Both are appropriate directions. The key will be successfully transitioning the roles and expectations at all levels of the organization to achieve this change in focus. Some lessons may be learned from the manufacturing oversight side of the organization where the system oversight model has been established for many years. This should lead to full utilization of the competent organizations already recognized as capable by the FAA through ODA designation. Some in industry, including Textron Aviation, have made a substantial investment to implement ODA and have yet to see the full benefit expected when it was introduced in 2006 (granted to Cessna in 2008).

Two additional areas of opportunity I would like to highlight are regulatory creep and global acceptance of FAA certifications.

In my earlier comments, I mentioned one element of a clear path to compliance was clear and stable aircraft requirements. If a regulation remains unchanged, aircraft manufacturers should be able to assume that a prior applicable means, demonstration and documentation of

compliance should still be valid. Unfortunately, this is not always the case. The published Transport Aircraft Issues List for a new part 25 aircraft, many of which lead to Issue Papers, is 19 pages long. Some of the items on the list are more than 10 years old, but have not been incorporated into publicly vetted regulation. All of that is before consideration of any new and novel aspects unique to the airplane that might drive special conditions or other new requirements. Each of these is an additional product requirement not defined in the current amendment of Part 25. In addition, resolution of each issue paper requires a multi-step position process consuming critical time and resources for both the applicant and the FAA. Each of these contributes to a higher level of uncertainty and risk in the execution of the product development and certification program. A streamlined process for updating regulatory requirements for Part 25 along the lines of the Part 23 changes recently completed could have a significant positive impact.

Another opportunity area is global acceptance of FAA certifications. As mentioned earlier, general and business aviation have a positive trade balance. Many of our products have a strong global presence, meaning US manufacturers need to have products validated by foreign authorities to have permission to register and operate in those countries. Validation challenges to FAA certifications have been increasing in recent years impacting the competitiveness of US products abroad. This can be particularly painful for new products entering a competitive global marketplace, delaying deliveries and resulting in lost sales. We would like to see a move toward mutual acceptance between the FAA and their top tier peers eliminating the duplication of effort and accelerating global availability of new products.

We appreciate the support of Congress and the commitment shown by FAA leadership for continued improvement of our aircraft certification process and infrastructure. The economic and safety benefits of being the global leader in this area are tremendous. Significant opportunities remain in front of us. Together we can make a better future for the general and business aviation industry and for our states and nation.

Thank you again, and I look forward to answering your questions.

APPENDIX TO TESTIMONY

ADDITIONAL VIEWS ON THE STATE OF AMERICAN AVIATION MANUFACTURING

PROVIDED BY

ADDITIONAL TEXTRON INC. BUSINESSES:

BELL HELICOPTER, LYCOMING ENGINES, TRU SIMULATION + TRAINING, AND TEXTRON SYSTEMS UNMANNED SYSTEMS

WEDNESDAY, FEBRUARY 15, 2017

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BELL HELICOPTER is an industry-leading producer of commercial and military vertical lift aircraft and the pioneer of the revolutionary tiltrotor aircraft. Bell Helicopter is globally recognized for world-class customer service, innovation, and superior quality. Approximately 13,000 Bell Helicopter manufactured and licensed aircraft are flying in more than 120 countries. Bell has nearly 6,000 employees in the US, a global headquarters in Texas, and manufacturing facilities in Texas, Tennessee, Alabama, and Louisiana.

- FAA's AIR Transformation is a step in the right direction. The real challenge will be ensuring that the message of this transformation makes its way throughout the entire organization especially in the case of fuller utilization of ODA and other delegation efforts. Additionally, while AIR Transformation intends to improve the overall certification process, it fails to include Flight Standards in the transformation which can be a stumbling block to the pace of certification programs since approving flight manuals and instructions for continued airworthiness is done by Flight Standards. Overall, the goal of AIR transformation must be to ensure that FAA lowers unnecessary barriers to incorporating safety technologies by fully delegating and utilizing ODA's and driving consistency across disparate FAA organizations.

- FAA's intent to reduce direct involvement in compliance activities and invest in up-front involvement in emerging technologies is the right focus and should help resolve the need to react by initiating lengthy exceptional certification processes (i.e., special conditions).

- Significant reductions in overall cost of certification could be realized if policy around FAA Conformity Inspections were revamped to more directly rely on reputable company's Quality System, as is the case with Transport Canada and EASA. FAA Conformity is a tax U.S. OEM's pay that our European and Canadian competition avoid.

LYCOMING ENGINES division of Avco Corporation, a wholly owned subsidiary of Textron, is the largest producer of purpose-designed piston engines for general aviation and unmanned aircraft in the world. With more than 40 active airframers today, their engines power a range of designs, from the most commonly used trainers for introductory professional pilot training to the high performance aerobatic racing aircraft used in the Red Bull Air Races; from the highest production small helicopters to the largest Goodyear blimps; Lycoming's footprint has spanned the world since 1929. Some of that footprint can be easily seen first-hand on display at the Smithsonian Institution, where the largest aviation piston engine ever designed is on display at the Udvar-Hazy center. Lycoming currently employs more than 400 employees at its manufacturing facility in Williamsport, PA; directly across the river from where the Little League World Series is played.

During the past few years, beginning with Administrator Babbitt and continuing with Administrator Huerta, Lycoming has seen some very positive and progressive initiatives started by the FAA that absolutely must continue toward completion. Eventually, these initiatives will drive more extensive and long-lasting cultural changes at the FAA and are key to securing its position as a leading Civil Aviation Authority in the World. Both Lycoming (as a manufacturer) and consumers are benefitting from these initiatives, which are also driving efficiencies within the FAA. Specifically, these examples are:

1) The realignment of the Aircraft Certification Service (AIR) into a new, functionally-aligned organizational structure. This re-organization enables a more holistic effort to increase the efficiency and effectiveness of the Service. Lycoming has already seen benefits of the risk based management approach that is part and parcel with the realignment.
2) Lycoming is one of two Textron affiliated businesses participating in the FAA manufacturing oversight prototype. Also a risk-based process in the end, in this model the FAA and Lycoming have collaborated to use the most modern thinking in quality controls from industry for oversight, as opposed to the decades old procedures long abandoned by other, more efficient and competitive manufacturers. Efficiency and improved methods for ensuring airworthiness will be the end result when this prototype moves to formal adoption.
3) The Piston Aviation Fuels Initiative, an active government-industry effort to remove tetraethyl lead from the last transportation fuel - AVGAS – is also an example of progressive thinking at the FAA. In our opinion it's also an example of a government-industry funded initiative that is tackling a difficult problem. We want to thank the Committee for their active support of this effort. This program would not be moving forward without the Committee's support and we hope that Committee language included in the FAA Reauthorization bill from the last Congress regarding fleet wide certification will be included once again.

None of the examples stated above have crossed the finish line yet, and Lycoming would like to see continued support from Congress and the FAA to push them toward completion. They are examples of progressive thinking targeting meaningful objectives with the full support of industry. Lycoming would like to see the FAA continue along these lines and use these examples to drive long-term cultural change, a change which would ensure our manufacturing competitiveness world-wide.

TRU SIMULATION + TRAINING delivers innovative, total aviation training solutions to the commercial and military markets while providing superior technical support and customer service. Employing more than 530 people throughout the US (with facilities in SC, FL, KS, and CA), TRU Simulation + Training is known for its high-fidelity training devices, pilot and maintenance training, military mission training, and aviation training services and support.

One issue which has a direct impact on TRU Simulation + Training's competitiveness involves scheduling the FAA National Simulator Program (NSP) team for an Initial Evaluation of its Flight Simulation Training Devices (FSTD)s in accordance with 14 CFR Part 60.
The FAA has a process for scheduling Initial Evaluations (Form - T-025). It begins with a request by the FSTD Sponsor for a specific FAA Initial Evaluation date. TRU Simulation + Training has observed instances when the Sponsor's requested date is not available (due to prior FAA commitments) and the next available date may be weeks or months after the requested date. If the delay between a requested date and FAA availability is long, it can have substantial direct and indirect commercial financial impact. There are a couple of ways to address this issue: Request an FAA Initial Evaluation date far in advance (i.e. 180 days) of the planned FSTD Readiness date at increased risk of readiness but higher probability of securing date; or Increase FAA NSP capacity and, if necessary, budget to be more responsive (less delay) to requested dates. TRU Simulation + Training encourages Congress and the FAA to consider the second of these two options as a way to increase efficiency throughout the evaluation process.

TEXTRON SYSTEMS UNMANNED SYSTEMS employs more than 1,000 people in Maryland and Virginia, although most are associated with the company's defense products and support. The company's Shadow TUAS (a US Army program) has surpassed the one million flying hour milestone, most of which have come in overseas combat operations. The Aerosonde is also being flown in support of US military combat operations overseas, but it has a remarkable history of success as a meteorological platform flying in some of the world's harshest environments. From more than 1,000 flight hours in the Arctic and Antarctica, to history-making transoceanic and hurricane-hunting expeditions, the system is proven and reliable with more than 165,000 total flying hours.

Textron Systems Unmanned Systems has opened a Service and Support Center at the Allen C. Perkinson Airport in Blackstone, VA, which is part of the FAA's Mid Atlantic Aviation Partnership (MAAP) UAS test site. As part of its flight training mission, the facility's UAS pilots have flown nearly 1,000 flights in the NAS totaling more than 1500 hours.

While Textron Systems Unmanned Systems appreciates the progress that the FAA has made in advancing UAS flights in the NAS, the Aerosonde is a Group 2 type UAS, and therefore not covered by the current FAA regulations for UAS under 55 lbs. From an economic development perspective, there are large commercial markets in the US that are being held back due to the Part 107 limitations for Beyond Visual Line of Sight flights and aircraft weight. Industries such as Precision Agriculture, Insurance, and Oil & Gas would realize significant economic benefits from using bigger unmanned aircraft with longer ranges. Currently, the use of Group 2 type UAS are not economically viable at scale. Textron Systems Unmanned Systems hopes that Congress, industry and the FAA can continue to work toward accommodations for Group 2 type UAS flights in the NAS.

Charlie Wiplinger
1700 Henry Ave
South St. Paul, MN 55075

February 14, 2017

Honorable Jason Lewis
United States House of Representatives
418 Cannon House Office Building
Washington, DC 20515

Dear Mr. Lewis:

On behalf of Wipaire and its 183 employees, we are pleased that you represent us as a member of the House Transportation and Infrastructure Committee. We look forward to working with you on aviation related matters. The general aviation industry is an important one and your leadership on these issues will be critical to my company and Minnesota in the 115th Congress.

For 55 years, Wipaire has been engineering and manufacturing a full line of aircraft floats for all sizes of aircraft from the Piper Cub to the Viking Twin Otter, including most single engine Cessna aircraft. In addition, Wipaire has engineered over 100 Supplemental Type Certificated modifications for improved performance, convenience, and reliability. As a leading aircraft service provider, Wipaire offers maintenance, avionics installation and repair, custom interior design and installation, and exterior paint refinishing all in one convenient location. Wipaire is recognized worldwide for quality products and engineering expertise.

I appreciate your contacting me about the hearing being held this week entitled "Building a 21st Century infrastructure for America: State of American Aviation Manufacturing". I view this as a very valuable hearing and one that is timely given the need for continued reform of the Federal Aviation Administration's (FAA) certification process. While key progress has been made, there remains a need for congressional oversight and action to ensure that these reforms are fully realized. There are ways that the process can be more efficient and effective. Title III – "FAA Safety Certification Reform" from last year's House Transportation and Infrastructure Committee bill is a good starting point. While there were other provisions in this bill that raised concern and required more thoughtful vetting, this particular title was very advantageous and I encourage you and your colleagues to pass these key reforms as expeditiously as possible.

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As a niche manufacturer in aviation, I believe that innovation and being able to quickly certify products is key to our industry's health. FAA, industry, and Congress worked together to push forward a final rule that implements a dramatic restructuring of the Part 23 regulations for small aircraft. By making the certification process for Part 23 aircraft less prescriptive through a focus on performance-based standards, it will enable safety-enhancing technologies to be adopted in less time. This benefits companies like ours which provide these types of enhancements to Part 23 aircraft and can serve as a model for other FAA regulations. Other parts of this title, such as Organizational Designation Authorization (ODA) will also become more important to us as we look forward towards growth opportunities.

Outside of Part 23 Certification Reform, Congress should act boldly to further the acceptance of FAA-certified components and aircraft by aviation authorities abroad. Failing to do so will prove harmful to this US industry, as manufacturers seek a more efficient and effective path to the global market. While we enjoy a good relationship with the FAA, which helps facilitate a relatively predictable certification path, we face much more uncertainty when attempting to validate our products globally. The more that FAA can do now to encourage their partners abroad to understand their approval process and accept products like ours the more we benefit. Simply put, it will encourage the flow of exports from companies small and large, promoting job growth and healthy aviation companies.

Again, thank you for the opportunity to share our views on the aviation manufacturing marketplace. We look forward to continuing to work with you, your staff, and colleagues to make strides in this arena.

Sincerely,

Chuck Wiplinger
President / COO