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OVERSIGHT OF THE FEDERAL AVIATION ADMINISTRATION

HEARING

BEFORE A

SUBCOMMITTEE OF THE

COMMITTEE ON APPROPRIATIONS

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OVERSIGHT OF THE FEDERAL AVIATION ADMINISTRATION

WEDNESDAY, JULY 31, 2019

U.S. SENATE,
SUBCOMMITTEE OF THE COMMITTEE ON APPROPRIATIONS,
Washington, DC.

The subcommittee met at 9:45 a.m., in room SD–192, Dirksen Senate Office Building, Hon. Susan Collins (chairman) presiding.

Present: Senators Collins, Boozman, Capito, Hoeven, Reed, Murray, Durbin, and Manchin.

FEDERAL AVIATION ADMINISTRATION

STATEMENT OF CARL E. BURLESON, ACTING DEPUTY ADMINISTRATOR, FEDERAL AVIATION ADMINISTRATION

OPENING STATEMENT OF SENATOR SUSAN M. COLLINS

Senator COLLINS. The committee will come to order. Today, our subcommittee is holding an oversight hearing on the Federal Aviation Administration. I am very pleased to be joined by Senator Jack Reed, the subcommittee's ranking member. Senator Capito is here right from the start, and I am sure we will be joined by others.

The FAA is a $17 billion agency with 44,000 employees who are responsible for virtually every aspect of aviation in our country, including the safety of commercial airlines, general aviation, and cargo aircraft. Every day, FAA's air traffic controllers are responsible for more than 44,000 flights and 2.7 million airline passengers across more than 29 million square miles of airspace.

Over the last year, much-needed attention has been focused on the crashes of Lion Air Flight 610 and Ethiopian Air Flight 302. Serious questions have been raised about the effectiveness of the FAA's regulatory framework. For the sake of the 346 victims and their families, we need to ensure that these accidents are thoroughly investigated, their causes identified, and their solutions implemented.

Unfortunately, at this point, we do not yet have the conclusive results of the two crash investigations and cannot say definitively why these terrible accidents occurred. For these types of catastrophic events, however, there is rarely just one cause. There is almost always a cascade of errors or failures that lead to an airplane crash.

Nevertheless, since the second crash in March, we continue to hear of more problems with FAA's certification of the 737 MAX aircraft. A New York Times article over the weekend shed additional

light on some of the problems with the FAA's Organizational Designation Authorization, or ODA, program. In particular, the press story details instances in which FAA managers appeared to be more concerned with Boeing's production timeline rather than the safety recommendations of its own engineers.

These stories are particularly damaging for the leadership of FAA's safety oversight. The ongoing investigations by the Inspector General and the National Transportation Safety Board are looking at all aspects of the MAX aircraft, including the certification of the MCAS, (Manoeuvring Characteristics Augmentation System) the installation of the angle-of-attack sensors, the pilot training, the level of automation in the aircraft, and the human factors related to the design of the cockpit.

While the MAX aircraft accidents deserve much of our attention this year, it is critical that the FAA continues to make progress in improving air travel in our Nation's congested airspace. Our Nation's airspace continues to become more complex with new players in the aviation industry, such as commercial space operators and unmanned aircraft systems, or drones.

During the last two years, this subcommittee has provided substantial funding to improve safety, increase the efficiency of air travel, and modernize the infrastructure at our Nation's airports, and I look forward to hearing from our witnesses on how these investments have improved air travel for the public.

The NextGen programs, like Performance-Based Navigation and Time-Based Flow Management, will improve air travel by reducing flight times. Planes are burning less fuel, emitting fewer emissions, and creating less noise through other NextGen improvements.

By January 1st of next year, all commercial aircraft and most general aviation will be equipped with Automatic Dependent Surveillance-Broadcast, or ADS–B, allowing us to transition away from ground-based radar to more precise GPS tracking. With ADS–B, pilots can see other aircraft in the sky, pinpoint hazardous weather and terrain, and receive important flight information. ADS–B will also improve the efficiency of our skies by allowing planes to fly safely with reduced separation and also enhance safety on the tarmac by reducing the risk of runway incursions.

Turning to our Nation's airports, I would point to the $1.5 billion in additional funding that this subcommittee has provided for our Nation's airports over the last two years. This funding has been particularly beneficial for small, rural airports, such as those in—such as the one in Rangeley, Maine, which was awarded an $11 million grant for a runway extension project. With the longer runway, LifeFlight of Maine, an air ambulance system, will be able to bring its twin turboprop aircraft to provide air medical services for communities in an area that has access to few medical providers.

I look forward to hearing from our witnesses on all of these key issues this morning, but particularly the issues of safety. Let me now turn to Senator Reed for his opening remarks.

OPENING STATEMENT OF SENATOR JACK REED

Senator REED. Thank you, Chairman Collins.

This is a timely hearing, given the unresolved safety issues that have led to two fatal airline crashes and the grounding of the Boe-

ing 737 MAX. Every possible measure must be taken to ensure the aircraft is safe before it is allowed to return to the skies. It is critical that Boeing and the FAA get this right in order to restore public confidence in both the aircraft and the certification and oversight process. Failure to do so will jeopardize continued U.S. leadership in the aviation sector and FAA standing as the gold standard for safety.

As the chairman indicated, a New York Times investigative report released last week describes, in their words, a broken regulatory process that effectively neutered the oversight authority of the FAA. You can see the deference granted to industry reflected plainly in a joint industry-FAA product certification guide published in 2017, which highlights "How an Applicant and the FAA can begin a transition to a state where there is progressively less direct involvement of the FAA in the compliance activities of the Applicant."

In its article, the Times goes on to say that at a crucial moment in the MAX's development, the agency operated in the background, mainly monitoring Boeing's progress and checking paperwork. Boeing was treated as a client, with FAA officials making decisions based on the company's deadlines and budget. FAA engineers found they had little power, even when they did raise concerns. These allegations are grave and speak to the need for a culture change that rebalances the relationship between regulator and industry.

The need for a culture change appears to extend beyond the FAA's certification program. The DOD Inspector General is raising alarms on the FAA's oversight of the air carrier maintenance program. Specifically, the IG raised concerns that the FAA has shifted its safety strategy from emphasizing enforcement actions to a more relaxed compliance assistance model to help air carriers address the root causes for noncompliance of safety regulations. In doing so, the FAA's current guidance allows inspectors to close safety compliance actions before validating that the corrective action has been implemented and is effective.

FAA also lacks centralized database for inspectors to identify, track, and monitor safety violations and compliance. This leaves a huge gap in FAA oversight of air carrier maintenance activities.

To add to the many challenges the FAA faces today, there are very few technologies that are developed as rapidly as unmanned aviation systems, or UAS, or drones. Drones are changing the way we do business, helping farmers monitor their crops, and improving the way we inspect pipelines and railroads, and have the potential to revolutionize the delivery of goods in this country.

These are exciting developments, but there is also growing concern about the incidents being reported in the news, whether it is a drone flying dangerously close to a passenger airplane or a drone with a camera flying over someone else's private property.

The FAA needs to establish clear rules of the air to safely integrate this technology into our airspace, and there is a lot of catching up to do. UAS technology is evolving so quickly, and we need to know that the FAA is keeping up and responding strategically.

I look forward to hearing about your progress in this issue area, particularly in mitigating the risk of drones in and around airports.

I know the Blue Ribbon Panel on UAS Mitigation at Airports interim report was just released, and I am interested to hear your reactions. I look forward to hearing from all of our witnesses today.

The FAA is certainly facing many challenges ahead in an increasingly complex airspace. I am hopeful that, with your leadership, we will sustain the leadership of the United States in having the safest, most efficient aviation system in the world.

Thank you, Madam Chairman.

Senator COLLINS. Thank you, Senator Reed.

I now want to turn to our panel of witnesses, all of whom are senior career officials of the FAA. We are joined today by Carl Burleson, the Acting Deputy Administrator of the FAA; Ali Bahrami, the Associate Administrator for Aviation Safety; Winsome Lenfert, the Deputy Associate Administrator for Airports; and Angela Stubblefield, the Deputy Administrator for Security and Hazardous Materials.

Mr. Burleson, we will start with you.

SUMMARY STATEMENT OF HON. CARL E. BURLESON

Mr. BURLESON. Thank you, Chairman Collins, Ranking Member Reed, and members of the subcommittee.

Thank you for inviting us all to speak with you today to update you on the Federal Aviation Administration's work to fulfill its mission to provide the safest, most efficient airspace system in the world. We are committed to advancing the Administration and the Department of Transportation's priorities of creating a stronger infrastructure and maintaining American leadership in innovation, while ensuring safety and access for all users in the National Airspace System, or NAS.

As Chairman Collins and Ranking Member Reed just noted, innovation is reshaping the NAS, and the pace of technological change is nothing short of amazing. Consider that we have approximately 1.4 million drones registered in less than 4 years, flying taxis in experimental design or testing phase with major aerospace companies. We have proposed new rules to remove the red tape and streamline the testing process for a next generation of civil supersonic aircraft, and we have civilian space pioneers getting ready to take suborbital excursions offered by multiple startup space companies at nontraditional launch sites. That is a challenge for the FAA, and one we welcome.

How do we introduce these new entrants while simultaneously modernizing the National Airspace and maintaining safety and access for all users? Congress provided us a reliable foundation to do this through the FAA Reauthorization and the Consolidated Appropriations Act, and we are working diligently to accomplish the directives set forth in these bills.

The safe integration of UAS and commercial space operations are a key priority for the FAA. We are adjusting processes and practices to accommodate more of these operations without compromising safety. We are taking concrete steps to fulfill this mission.

For UAS, we have deployed the prototype Low Altitude Authorization and Notification Capability, or LAANC, at nearly 300 air traffic facilities, covering about 500 airports and more than 100 contract towers. LAANC allows UAS operators to gain airspace au-

thorization in a matter of seconds, compared to weeks previously. LAANC is a good first step, as we progress toward automated air traffic management for drones.

We took another concrete step for commercial space integration by opening the Challenger Room inside the Air Traffic Control System Command Center, where Joint Space Operations Group assessed proposed launch and re-entry operations that have an impact on the Nation's airspace. This greater operational visibility, coupled with the space data integrator that we are developing, will allow us to safely reduce the amount of airspace that must be closed to other users during launch and re-entry.

In addition to our UAS and space integration activities, we are also operationalizing NextGen Technologies, including ADS–B Out and Terminal Flight Data Manager. ADS–B Out, which will be required for aircraft operating in most U.S. airspace on January 1, 2020, provides surveillance information that is more accurate than radar, and more cost effective, especially in remote areas like the Gulf of Mexico. To date, roughly 80 percent of the U.S. airline fleet, and more than 60,000 general aviation aircraft have been equipped.

We expect to start operational testing of Terminal Flight Data Manager, or TFDM, this summer. This will allow us to build a virtual departure queue at airports so flights can wait at the gate or a non-movement area with their engines off until they have a direct route to the runway. By moving electronic data exchange, TFDM will also save time for our controllers in the tower cab by eliminating certain manual processes.

We are also working to make sure a new generation of Americans are ready to enter the aerospace workforce. In fact, one of the highest priorities at the FAA is to bring new, well-trained women and men into the aviation system. We have established an Aviation Workforce Steering Committee to focus on broadening the pipeline of young people interested in aviation careers, enhancing the proficiency of training and targeting skills we need in the future, and partnering with academia and industry to achieve these outcomes.

In conclusion, let me reiterate that the men and women of the FAA are committed to ensuring the United States is the gold standard in aviation safety. We would be the first to acknowledge we are not perfect. But whether a technician maintaining power systems at a facility in New Hampshire, a safety inspector helping educate the next generation of pilots in Florida, or a controller working traffic in Chicago, FAA's employees are not complacent about their mission. They work every day to ensure the safety of the American traveling public. That is why we are confident, with the support of this committee and the robust engagement of our stakeholders, we can safely achieve innovation necessary to continue America's global leadership.

Thank you.

[The statement follows:]

PREPARED STATEMENT OF CARL E. BURLESON

Chairman Collins, Ranking Member Reed, Members of the Subcommittee.

Thank you for inviting me to speak with you today to update you on the Federal Aviation Administration's (FAA) work to fulfill its mission to provide the safest, most efficient airspace system in the world. The FAA is committed to advancing the

Administration's and the Department of Transportation's priorities of creating stronger infrastructure that supports a growing economy and continuing American leadership in innovation while maintaining safety and access for all users of the National Airspace System (NAS). Our employees are working diligently to accomplish the directives Congress set forth in the *FAA Reauthorization Act of 2018 and the Consolidated Appropriations Act, 2019*, which together provide a reliable foundation for the FAA to achieve these objectives. Accompanying me today are Ali Bahrami, Associate Administrator for Aviation Safety; Angela H. Stubblefield, Deputy Associate Administrator for Security and Hazardous Materials Safety; and Winsome Lenfert, Deputy Associate Administrator for Airports. With their help, I would like to highlight for you some of our activities in these specific areas: aviation safety, unmanned aircraft systems (UAS) integration, and airports and infrastructure.

AVIATION SAFETY

Safety is the core of the Federal Aviation Administration's mission and our top priority. With the support of this Committee, we have worked tirelessly to take a more proactive, datadriven approach to oversight that prioritizes safety above all else inside the FAA and within the aviation community that we regulate. The result of this approach is that the United States has the safest air transportation system in the world. Since 1997, the risk of a fatal commercial aviation accident in the United States has been cut by 94 percent. With respect to commercial space transportation, since 1995, there have been a total of 388 licensed or permitted launches and reentries (19 so far in 2019), all without any fatalities, serious injuries, or significant property damage to the general public. In the past 10 years, there has been one passenger fatality on a U.S. commercial airline in over 90 million flights. But one fatality is one too many, and a healthy safety culture requires continuous attention and commitment to continuous improvement.

In order to maintain the safest air transportation system in the world, the FAA has evolved from a prescriptive and more reactive approach to its safety oversight responsibilities to one that is performance-based, proactive, centered on managing risk, and focused on continuous improvement. This approach to safety oversight relies on access to data and requires the open and transparent exchange of information. We know that it takes collaboration, communication, and common safety objectives to allow the FAA and the aviation community to identify system hazards and to implement safety solutions. This approach gives us knowledge that we would not otherwise have about safety events and risks. Sharing safety issues, trends, and lessons learned is critical to recognizing potential risks in the system. The more data we have, the more we can learn about the system, which in turn allows us to better manage and improve the system.

The FAA's grounding of the Boeing 737 MAX airplane placed a spotlight on safety and our approach to oversight of those we regulate. With respect to the certification of the 737 MAX, the facts are these: it took 5 years to certify the 737 MAX. Boeing applied for certification in January 2012. The certification was completed in March 2017. During those 5 years, FAA safety engineers and test pilots put in 110,000 hours of work, and they flew or supported 297 test flights. After certification of an aircraft design, the FAA continues to oversee the aircraft's production and operation. As we obtain pertinent information, identify potential risk, or learn of a system failure, we analyze it, determine how best to mitigate the risk, and require operators to implement the mitigation.

This approach to safety and fact-based, data-driven decisionmaking has been the FAA's guiding principle in our response to the Lion Air and Ethiopian Airlines accidents. Once the FAA had data showing similarities between the two accidents that warranted further investigation of the possibility of a shared cause, the FAA made the decision to ground all 737 MAX airplanes operated by U.S. airlines or in U.S. territory pending further investigation.

As part of the FAA's commitment to continuous improvement, we both welcome and invite review of our processes and procedures. A number of reviews and audits have been initiated to look at different aspects of the 737 MAX certification. After the FAA grounded the 737 MAX, Secretary Chao asked the Department of Transportation's Inspector General to conduct an audit of the certification for the 737 MAX, with the goal of compiling an objective and detailed factual history of the activities that resulted in the certification of the 737 MAX aircraft. Secretary Chao also announced the establishment of a Special Committee to review the FAA's procedures for the certification of new aircraft, including the 737 MAX. The Special Committee to Review FAA's Aircraft Certification Process is an independent body whose findings and recommendations will be presented directly to the Secretary and the FAA Administrator.

The FAA also established a Joint Authorities Technical Review (JATR) to conduct a comprehensive review of the certification of the automated flight control system on the Boeing 737 MAX. The JATR is chaired by former NTSB Chairman Christopher Hart and comprises a team of experts from the FAA, National Aeronautics and Space Administration (NASA), and the aviation authorities of Australia, Brazil, Canada, China, the European Union, Indonesia, Japan, Singapore, and the United Arab Emirates. Completion of the JATR's work is not a prerequisite for returning the 737 MAX to service; however, the FAA will consider the findings and recommendations of each of the participants as we continually review our processes.

Additionally, the FAA met with safety representatives of the three U.S.-based commercial airlines that have the Boeing 737 MAX in their fleets, as well as the pilot unions for those airlines. This meeting was an opportunity for the FAA to hear individual views from operators and pilots of the 737 MAX as the agency evaluates what needs to be done before the FAA makes a decision to return the aircraft to service in the United States. In keeping with the FAA's longstanding cooperation with its international partners, the FAA also recently hosted a meeting of Directors General of civil aviation authorities from around the world to discuss the FAA's activities toward ensuring the safe return of the 737 MAX to service. We continue to be in frequent communication with the international aviation safety community and are working closely with our counterparts to address their concerns and keep them informed of progress.

The FAA also initiated a multi-agency Technical Advisory Board (TAB) review of Boeing's Maneuvering Characteristics Augmentation System (MCAS) software update and system safety assessment in order to determine sufficiency. The TAB consists of a team of experts from the U.S. Air Force, NASA, Volpe National Transportation Systems Center, and the FAA. None of the TAB experts have been involved in any aspect of the Boeing 737 MAX certification. The TAB is charged with evaluating Boeing and FAA efforts related to the software update and its integration into the flight control system. The TAB will identify issues where further investigation is required prior to approval of the design change. The JATR is looking broadly at the original certification of the 737 MAX flight control system, while the TAB is evaluating Boeing's proposed technical solutions related to the two accidents. The TAB's recommendations will directly inform the FAA's decision concerning the 737 MAX fleet's return to service.

The FAA is following a thorough process, not a prescribed timeline, for returning the 737 MAX to passenger service. We continue to evaluate Boeing's software modification to the MCAS, and we are still developing necessary training requirements. The 737 MAX will not return to service for U.S. carriers and in U.S. airspace until the FAA's analysis of the facts and technical data indicate that it is safe to do so.

UAS INTEGRATION

The FAA's commitment to global leadership in aviation is equally evident in the area of UAS integration. The steady development and expansion of UAS has created a dynamic change in aviation that we have not seen since the dawn of the jet age. The FAA is committed to supporting this change and to working with the UAS community to ensure that this technology is integrated into the NAS safely and securely. UAS offer expanded capabilities in aviation with a fast pace of innovation and increasing volume of operations. For example, the progression of UAS innovation and the change in product cycles can generally be measured in months, not years. Similarly, the volume of UAS operations is outpacing manned aircraft. Currently, there are nearly four times as many UAS as registered manned aircraft.

The new dynamics that UAS bring to the NAS redouble our focus on the safety of all aircraft operations as the FAA's first priority. An ongoing challenge to UAS integration is the potential for conflict between manned and unmanned aircraft. We continue to engage in outreach to UAS operators and the public at large to educate current and prospective drone users about their safety responsibilities. Efforts such as the "Know Before You Fly" information campaign have encouraged UAS operators to understand the rules and responsibilities for flying an aircraft in the NAS. This campaign and the FAA's related work on the "B4UFLY" mobile application are bearing fruit. The annual rate of increase of pilot reports about UAS operating in places where they should not be is dropping by 50 percent each year—while the number of UAS operating in the airspace is increasing.

The UAS Integration Pilot Program (IPP)[1] also has been a crucial step in accelerating the Department of Transportation's and FAA's UAS integration efforts. Through the IPP, nine different communities across the country are working to identify ways to balance local and national interests. The IPP is a case study in communications, security, privacy, and data collection. The experience gained and the data collected from the IPP will help ensure the United States remains the global leader in safe UAS integration and fully realizes the economic and societal benefits of this technology. In fact, the IPP is already paying dividends on the investment. Recently, the FAA granted the first air carrier certification to a commercial drone operator for package deliveries in rural Blacksburg, Virginia. Although the regulatory framework for broader drone operations is not complete, the IPP has helped to inform the FAA and drone operators of the extent to which operations can begin under existing rules.

UAS RULEMAKING

The FAA currently is enabling safe UAS operations using existing rules, but we also understand the need to focus on enabling an ever-expanding universe of UAS operations and capabilities. In order to allow for such operations to be conducted safely and securely, the FAA has moved forward with a number of regulatory initiatives. Together with the Department of Transportation's Office of the Secretary, the FAA recently published a proposed new rule on the operation of small UAS over people.[2] The proposal seeks to mitigate safety risks without inhibiting technological and operational advances. The FAA also recently published an advanced notice of proposed rulemaking seeking public input to identify drone safety and security issues and explore ways to mitigate risks UAS may pose to other aircraft, people on the ground, or to national security.[3] The FAA's security partners have helped to highlight some of the important security and public safety questions that must be addressed.

Additionally, in February 2019, the FAA published an interim final rule on external marking requirements for small UAS.[4] The rule requires small unmanned aircraft owners to display their unique identifier (registration number) on an external surface of the aircraft. Identifiers are assigned by the FAA upon completion of the registration process. Small unmanned aircraft owners are no longer permitted to enclose the FAA-issued registration number in a compartment. The FAA took this action to address concerns expressed by the law enforcement community and the FAA's interagency security partners regarding the risk a concealed explosive device poses to first responders who must open a compartment to attempt to find the small unmanned aircraft's registration number.

UAS REMOTE IDENTIFICATION

Going forward, the ability to remotely identify UAS operators will be a crucial stepping stone for UAS traffic management and will facilitate what we envision as high volume, safe, and secure low-altitude UAS operations. Congress recognized the importance of remote identification when it enacted the FAA Extension, Safety, and Security Act of 2016. That Act laid the foundation for FAA's work with operators and our security partners to realize the importance of remote identification and to reach a consensus on how to address it. More recently, the FAA Reauthorization Act of 2018 provided the FAA with additional authority to move ahead with work on universal registration and remote identification—both of which are critical to the success of commercial UAS operations and UAS integration more broadly.

Remote identification is fundamental to both safety and security of drone operations. Remote identification will be necessary for routine beyond visual line-of-sight operations and operations over people, package delivery, operations in congested areas, and the continued safe operation of all aircraft in shared airspace. It will also be foundational for the advancement of automated passenger or cargo-carrying air transportation—what is often referred to as Urban Air Mobility. From a security perspective, remote identification would enable us to connect a suspect UAS to its control station location and to identify the registered owner of a suspect UAS. With universal remote identification, the FAA, our national security partners, and state

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[1] https://www.whitehouse.gov/presidential-actions/presidential-memorandum-secretary-transportation/

[2] https://www.Federalregister.gov/documents/2019/02/13/2019–00732/operation-of-small-unmanned-aircraft- systems-over-people

[3] https://www.Federalregister.gov/documents/2019/02/13/2019–00758/safe-and-secure-operations-of-small- unmanned-aircraft-systems

[4] https://www.Federalregister.gov/documents/2019/02/13/2019–00765/external-marking-requirement-for-small-unmanned-aircraft

and local law enforcement will be better able to locate and identify a UAS operator, determine if a UAS is being operated in an unsafe, unauthorized, or criminal manner, and take appropriate action if necessary. The FAA is committed to establishing remote identification requirements as quickly as possible.

UAS AND THE AIRPORT ENVIRONMENT

With the December 2018 protracted UAS disruption at Gatwick Airport, and other reported disruptions at airports around the world and in the United States, the FAA understands and shares the concerns of airlines, airport sponsors, and our security partners regarding the potential safety hazards and security threats presented by errant or malicious UAS, particularly in and around the airport environment. A number of airport sponsors have acquired or are pursuing possible acquisition of UAS detection systems for their airports. In an effort to make sure such activity is conducted in a safe and coordinated manner, in early May, the FAA sent informational correspondence to airport sponsors, which included information to support informed airport decisionmaking regarding the demonstration or installation of UAS detection systems at airports (including the legal uncertainties posed by certain UAS detection systems), answers to some frequently asked questions, and technical considerations that the FAA has used to assess the readiness of UAS detection technologies.[5] The FAA wants to coordinate with airports that plan to use UAS detection systems to ensure deployment and use do not create interference or obstruction with other aviation safety and efficiency systems.

Given the events in Gatwick, there is no doubt about the significant operational and economic impacts a persistent UAS disruption can have in the airport environment and the need to be able not only to detect, identify, and track a disruptive UAS, but also to be able to take action to end the disruption. The FAA along with our Federal security partners have formulated a concept of operations (CONOPS) for a National Federal Response plan through which current Federal counter-UAS (C–UAS) authorities and existing Federal C–UAS equipment can be rapidly projected into a major U.S. airport experiencing a persistent operational disruption due to an unauthorized UAS operation. This CONOPS has been socialized with airport and airline associations and should be finalized for implementation soon.

AIRPORTS AND INFRASTRUCTURE

Airport infrastructure in the United States, with 3,332 airports and 5,000 paved runways, supports our economic competitiveness and improves the safety and efficiency of our air transportation system. According to the FAA's most recent economic analysis, U.S. civil aviation accounts for $1.6 trillion in total economic activity and supports nearly 11 million jobs. The FAA's Office of Airports provides leadership in maintaining a safe, secure, efficient, environmentally sustainable, and fiscally responsible system of airports. Under Secretary Chao's leadership, the Department of Transportation and the FAA are delivering Airport Improvement Program (AIP) investments for the American people, who depend on reliable infrastructure. The FAA is also helping to streamline non-aeronautical development at airports and is increasing airport safety by addressing runway incursions and improving runway safety areas (RSA).

AIP INVESTMENTS

Through the Consolidated Appropriations Act, 2018, Congress provided an additional $1 million in supplemental funding for infrastructure grants. The FAA published a Federal Register notice on July 9, 2018[6], explaining the evaluation criteria and submission process for supplemental discretionary funding requests. The requirements under the Consolidated Appropriations Act, 2018 included: requiring the FAA to give "priority consideration" to specific types of airports (smaller and more rural airports); for non-primary airports, there is no local match required for the work covered by the grant; and requiring the FAA to obligate the supplemental funding by September 2020. After the FAA awarded an initial round of $205 million to 37 airports in 34 states in September 2018, airports in October 2018 submitted additional funding requests for grant awards in fiscal years 2019 or 2020. This project solicitation resulted in requests totaling $10.9 billion in funding.

On May 15, 2019, Secretary Chao announced the intent to award another $779 million in supplemental funding for infrastructure grants to 127 airports in all 50

[5] https://www.faa.gov/airports/airport__safety/media/Updated-Information-UAS-Detection-Countermeasures-Technology-Airports-20190507.pdf

[6] https://www.Federalregister.gov/documents/2018/07/09/2018–14675/supplemental-guidance-on-the-airport- improvement-program-aip-for-fiscal-years-2018–2020

states and Puerto Rico. This represented the final round of grants awarded under the supplemental funding provided in the *Consolidated Appropriations Act, 2018*. Overall, about 88 percent of the supplemental funds went to airports meeting the statutory criteria for "Priority Consideration" and more than $430 million went to non-primary airports. Recipients of the selected grants will still need to meet any remaining required approvals. Selected projects include runway reconstruction and rehabilitation, as well as new construction or rehabilitation of taxiways, aprons, and terminals. The construction and equipment supported by this funding increase airports' safety, emergency response capabilities, and capacity, and could support further potential growth and development within each airport's region. The FAA is currently working through the normal Airports Capital Improvement Plan (ACIP) process to identify and evaluate potential projects for the $500 million in supplemental funds appropriated in fiscal year 2019.

With regard to the total $3.18 billion in regular fiscal year 2019 AIP funding for airports across the United States, Secretary Chao has announced three allotments totaling almost $1.8 billion in grants awarded for over 900 airports. Some notable examples of the grant awards include:

$11 million for reconstruction of Runway 5/23 and mitigation of factors contributing to runway incursions in Des Moines, Iowa; $10.4 million for construction of an aircraft rescue and firefighting building and acquisition of two aircraft rescue and firefighting vehicles to enhance airport safety in Birmingham, Alabama; $3.1 million for runway rehabilitation in Charleston, West Virginia; $2.7 million for mitigation of airport noise in New Haven and East Haven,

Connecticut; and $2 million for rehabilitation of a general aviation apron used for aircraft parking in Helena, Montana.

STREAMLINING CERTAIN TYPES OF DEVELOPMENT

The Department of Transportation and the FAA are also working to streamline project reviews and remove unnecessary barriers to development. Section 163 of the *FAA Reauthorization Act of 2018* provided a framework for the FAA to determine that certain types of proposed development projects no longer trigger a need for formal FAA review and approval. To date, the FAA has received over 40 requests for determinations under section 163 and has issued 25 determinations. Some examples of projects receiving determinations under section 163 are the sale of 11.8 acres of airport land for development of a $37 million facility in the Purdue University-affiliated Discovery Park District in Lafayette, Indiana; and the long-term lease and construction of industrial warehouse flex facilities on 27 acres of land acquired with Airport Development Aid Program[7] funds in Pittsburgh, Pennsylvania. Because formal FAA review and approval is not required for these projects, they may be able to begin construction more quickly.

AIRPORT SAFETY

The FAA also is engaged in several successful efforts to improve safety at our nation's airports. Runway incursions, which include wrong runway landings and takeoffs, are a top airport safety concern for the FAA. Research has shown that airport geometry can contribute to runway incursions. As a result, the FAA has provided airports with updated guidance on recommended taxiway layouts.[8]

A research study conducted in fiscal year 2012 identified 140 locations with nonstandard geometry and a high incidence of runway incursions using data from fiscal year 2008 through fiscal year 2012. As a result, the FAA launched the Runway Incursion Mitigation (RIM) program in fiscal year 2015 to help mitigate the nonstandard geometry at these locations and ultimately reduce the number of runway incursions. The FAA maintains a RIM database, which is updated annually with new data.

Currently, there are 128 RIM locations at 77 airports. Airports can utilize a variety of mitigation strategies to eliminate nonstandard geometry configurations and reduce the likelihood of pilot confusion and ultimately, runway incursions. Airports often use a combination of mitigation strategies for RIM locations, which can include changes to airport geometry, lights, signs, markings, and/or operational procedures.

To date, 39 locations have been mitigated through the RIM program, including Santa Barbara Municipal Airport, Corpus Christi International Airport, and Albu-

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[7] A forerunner to the current Airport Improvement Program.

[8] Advisory Circular 150/5300–13, "Airport Design" and Engineering Brief Number 75, "Incorporation of Runway Incursion Prevention into Taxiway and Apron Design" available at www.faa.gov/airports/resources/.

querque International Airport. Before mitigation, these 39 locations experienced 435 runway incursions, compared to 30 runway incursions after mitigation. The RIM locations will be monitored over time to determine if mitigation efforts were successful and whether or not additional mitigation is needed.

The FAA has also worked to mitigate the impacts of runway excursions—incidents where an aircraft overruns, undershoots, or veers off the side of a runway—by improving RSA at commercial service airports. The RSA is typically 500 feet wide and extends 1,000 feet beyond each end of the runway. Many airports were built before the current 1,000-foot RSA standard was adopted approximately 20 years ago. In some cases, it is not practicable to achieve the full standard RSA because there may be a lack of available land. There also may be obstacles such as bodies of water, highways, railroads, and populated areas or severe drop-off of terrain.

The FAA began conducting research in the 1990s to determine how to improve safety at airports where the full RSA cannot be obtained. Working in concert with the University of Dayton, the Port Authority of New York and New Jersey, and the Engineered Arresting Systems Corporation (ESCO) of Logan Township, NJ, a new technology emerged to safely stop overrunning aircraft. Engineered Material Arresting System (EMAS) uses crushable material placed at the end of a runway to stop an aircraft that overruns the runway. The tires of the aircraft sink into the lightweight material and the aircraft is decelerated as it rolls through the material.

The EMAS technology improves safety benefits in cases where land is not available, or not possible to have the standard 1,000-foot overrun. A standard EMAS installation can stop an aircraft from overrunning the runway at approximately 80 miles per hour. An EMAS arrestor bed can be installed to help slow or stop an aircraft that overruns the runway, even if less than a standard RSA length is available.

As of October 2014, there are two manufacturers of EMAS products that meet the FAA requirements of advisory circular 150–5220–22B, "Engineered Materials Arresting Systems for Aircraft Overruns"—ESCO and Runway Safe. The FAA must review and approve each EMAS installation. Currently, ESCO's EMAS is installed on 112 runway ends at 68 U.S. airports, with plans to install 3 EMAS at 2 additional U.S. airports. Runway Safe's EMAS is installed on four runway ends at Chicago Midway Airport. To date, there have been 15 incidents where ESCO's EMAS has safely stopped overrunning aircraft with a total of 406 crew and passengers aboard those flights.

EMAS and other RSA improvements have minimized adverse impacts otherwise resulting from runway excursions. For example, in July 2013, Asiana Airlines Flight 214 landed short on Runway 28L at San Francisco International Airport. Although the aircraft sustained severe damage and three people died, everyone else on board the aircraft survived, with many being able to walk away, due to an RSA improvement that provided the standard 600' of available "undershoot" before the runway. Had it not been for this enhancement, the aircraft would have landed short in San Francisco Bay. And in March 2017, a McDonnell Douglas MD83 aircraft carrying the University of Michigan Men's Basketball Team overran Runway 23L during a rejected take-off at Detroit Willow Run Airport, and entered an RSA that had been improved to meet current standards. Although there was damage to the aircraft, there was only one minor injury reported.

CONCLUSION

In this age of innovation that is reshaping the NAS, the pace of technological change is nothing short of amazing. What has not changed, however, is the FAA's focus on safety. It is our number one priority and the foundation for everything that we do. The United States is the gold standard in aviation safety and the FAA is committed to maintaining that standard. In our quest for continuous safety improvement, we welcome external review of our systems, processes, and recommendations. We are confident, with the support of this Committee and the robust engagement of our stakeholders, we can innovate safely and continue to solidify America's role as the global leader in aviation.

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

Senator COLLINS. Mr. Bahrami.

STATEMENT OF ALI BAHRAMI, ASSOCIATE ADMINISTRATOR FOR AVIATION SAFETY, FEDERAL AVIATION ADMINISTRATION

Mr. BAHRAMI. Chairman Collins, Ranking Member Reed, members of the subcommittee, I appreciate the opportunity to address the Federal Aviation Administration's top priority—safety.

The Ethiopian Airlines Flight 302 and Lion Air 610 accidents are tragic events that seared the safety conscience of the entire aviation community. Learning from and recovering from these accidents is our primary focus within the aviation safety organization, along with maintaining the continued operational safety of the National Airspace System.

With respect to returning the 737 MAX to service, the FAA is following a thorough process, not a prescribed timeline. We continue to evaluate Boeing's software modification to the MCAS. In addition, we are developing necessary training requirements as we support various investigations and audits underway.

We are working through the Joint Authorities Technical Review, or JATR, to conduct a comprehensive review of the 737 MAX's flight control system certification. We have also initiated multiagency Technical Advisory Board review of Boeing's MCAS software update and system safety assessment. Let me emphasize that despite this strong spotlight we are under, we welcome the scrutiny as it will make us stronger.

Our data-driven, risk-based systems approach to standards, certification, and oversight forms the backbone of the proven quantifiable safety record that we have come to expect in commercial aviation. In the past 10 years, U.S. carriers have transported more than 7 billion passengers with one fatality, but one fatality is too many.

Further, as the aviation environment becomes more complex with the new entrants, we know a healthy safety culture requires commitment to continuous improvement. Through our new strategic plan, we are aligning our safety culture to be responsive to the new challenges we face, including new entrants, the fastest growing of which is, of course, unmanned aircraft systems, or UAS.

We have sharpened our focus on the safety of all aircraft operations, and we work on a number of initiatives to support UAS integration. We are using existing rules to enable UAS operations where we can and focusing on safety-enabling an ever-expanding universe of UAS operations and capabilities.

In conclusion, I would like to emphasize that in our quest for continuous safety improvement, we welcome external review of our systems and processes, and we remain committed to making commercial and general aviation even safer.

Thank you.

Senator COLLINS. Thank you. Ms. Lenfert.

STATEMENT OF WINSOME LENFERT, DEPUTY ASSOCIATE ADMINISTRATOR FOR AIRPORTS, FEDERAL AVIATION ADMINISTRATION

Ms. LENFERT. Chairman Collins, Ranking Member Reed, and members of the subcommittee, thank you for the opportunity to speak with you today.

The Office of Airports works with more than 5,000 airports across the country and, more specifically, 3,300 airports that are part of the National Plan of Integrated Airport Systems. We also work closely with airlines, general aviation pilots, State aviation professionals, neighboring communities, local governments, and many other stakeholders. Our top priority is always the safety of the traveling public, while optimizing capacity, efficiency, and secu-

rity of our Nation's airports. We also ensure environmental responsibility and financial accountability.

We are deeply grateful to the United States Congress, and particularly this committee, for the trust that you place in us. The needs far exceed the available resources, but the funds that you provide are crucial to keeping our Nation's airports as safe as the airways that connect them. The nationwide system of airports that we help maintain represents a critical safety net, which is part of why the United States has the safest air transportation system in the world. They are also crucial to our national, regional and local economies.

Understanding the importance of infrastructure to our Nation's economic wellbeing, we work closely with airport operators and their planning, and their development programs. In 2018, we issued a total of $3.46 billion in airport improvement funding, including a portion of the fiscal year 2018 supplemental funds. In Fiscal 2019, so far we have processed more than $2.4 billion in grants, including additional funds from the fiscal year 2018 supplemental program.

We also continue to improve safety through inspections of certificated airports, through site visits, and through our latest initiative, the Runway Incursion Mitigation Program. Through construction, procedures, and signage and marking changes, we were able to reduce runway incursions at 39 locations by 93 percent.

But we could not accomplish this work without our highly skilled professional workforce. They, too, depend upon the resources that allow them to perform their daily functions, such as helping develop runway extensions in remote areas. They help figure out how to optimize safety and capacity at constrained airports. They help determine how to justify a runway extension with a balance between community environmental concerns and the system capacity and safety needs.

Our compliance experts ensure that aviation-related revenues are used for aviation-related purposes, which is critical to the functionality of our system. Our people work closely with other parts of the FAA, as well as other Federal, State, and local agencies. We are dedicated to working with you and our stakeholders that we serve to help solve problems and to ensure that we have the safest and most efficient airport system.

Thank you.

Senator COLLINS. Thank you. Ms. Stubblefield.

STATEMENT OF ANGELA STUBBLEFIELD, DEPUTY ASSOCIATE ADMINISTRATOR FOR SECURITY/HAZARDOUS MATERIALS SAFETY, FEDERAL AVIATION ADMINISTRATION

Ms. STUBBLEFIELD. Chairman Collins, Ranking Member Reed, and members of the subcommittee, thank you for inviting me to speak with you today about how the FAA is addressing security risks associated with UAS integration.

Safe and secure integration of UAS into the National Airspace System cannot be achieved without addressing the risks posed by malicious or errant UAS operations. Just as the U.S. Government has built a strong foundation of aviation security to support manned aircraft operations, we are focused on creating a comprehensive and holistic UAS security regime that includes the abil-

ity to prevent, deter, detect, and, when necessary, respond to unauthorized UAS operations.

The FAA's prevention efforts include continuous public outreach and education, and support to law enforcement and public safety agencies. The FAA and our security partners believe most noncompliant UAS operations are committed by the clueless and the careless with no malicious intent. To deter reckless operators, we are providing instructional resources and investigative support to law enforcement agencies, which also enables FAA civil enforcement.

We are publishing a remote identification rule to support prevention, deterrence, and detection of potential safety and security risks. The ability to remotely identify UAS and their operators in flight is crucial to locating and taking appropriate action against UAS operators posing a safety or security risk. Detecting the presence of an unauthorized UAS and locating the operator is critical to UAS safety, security, and integration. The FAA is providing information to airport sponsors to help them make informed decisions about deploying UAS detection technology at some airports.

Turning to response, the FAA is closely coordinating with the Departments of Defense, Energy, Justice, and Homeland Security to ensure counter-UAS technologies allow them to accomplish their security missions, while avoiding adverse impacts to the National Airspace System. For domestic airports, several unique challenges in the airport environment require more evaluation and development of counter-UAS technologies. And as directed in the FAA Reauthorization, we are planning to test UAS detection and mitigations systems at several airports.

We share concerns about the potential impacts of a drone disrupting airport operations and are closely coordinating with our Federal security partners to finalize a national Federal response plan to deploy counter-UAS authorities and technologies to address a persistent UAS disruption at a major U.S. airport, ensuring the U.S. Government is ready to respond to an event similar to the UAS disruption at UK's Gatwick Airport in December 2018. Working together to prevent, deter, detect, and respond to UAS risks, the FAA, security and law enforcement agencies, and critical infrastructure owners will enable the United States to continue leading the way in UAS integration and innovation, while maintaining the safest, most secure, and most efficient airspace system in the world.

Thank you.

Senator COLLINS. Thank you.

Mr. Burleson, I want to start with you today. In your testimony, you state that the FAA prioritizes safety above all else, which is what we would want and expect. When one reads the New York Times story and the Wall Street Journal story that came out today, one has to question what has happened to that commitment, whether resource shortages have caused the agency to be too deferential to the aircraft manufacturer and whether it is really wise in the case of Boeing to have allowed the company to certify 96 percent of its own work.

More disturbing, the New York Times story recounts case after case where safety concerns seem to be placed second to concerns

about Boeing being able to meet its own timelines. Would you comment on why the FAA would give apparently more consideration to an aircraft manufacturer's production timeline than to safety concerns that were raised?

Mr. BURLESON. Senator, thank you very much for the question.

And again, let me start with foundational and FAA, and our core principle is safety. I think you see that in—as we are working through all the challenges of coming to a place where we feel comfortable ungrounding the MAX, step by step. We constantly say there is no timeline. The issue is safety.

In terms of the newspaper reports, I think that, again, that they offer a perspective, but I would say that the professionals who are working this day in and day out have an incredible commitment to trying to get it right. There are often times as—and certainly Mr. Bahrami can elaborate on this because, having worked in the safety part of the FAA, he certainly has a lot more knowledge of the details of the engineering process, the process of delegation. But I will say, we do not, and never have, allowed self-certification of—whether it is Boeing or any other product.

We are fundamentally involved at the beginning of a certification project. The Boeing aircraft that—the MAX took 5 years to certify. We were in the beginning phases of deciding what was more routine, what could be delegated in that process, and then what the key technologies and risks that had to be addressed.

So, again, I think we have been fully knowledgeable in dealing with the development of that plane, and I think that while—and we have—again, the process of delegation is longstanding and has, again, been a critical part of producing the safety record we have in the United States.

I will say it doesn't mean that it is perfect. It doesn't mean that each decision we have made has always been perfect. But I do think the fundamental process of how we went about certifying the MAX was sound.

And I think the other positive here, Senator, is that, as Mr. Bahrami mentioned in his testimony, we have a number of reviews ongoing, looking at what we did in the past with that. We certainly are committed to if there are improvements we need to make, changes we need to make, if there needs to be a different balance in delegation or ODA, we are certainly willing and ready to take those recommendations.

And there is also committees that are also reviewing—looking at the future. Because, again, airplanes are not going to be less computer centric going forward. So, again, we are looking not just at what—how we can improve the past, but we are also at this point waiting to see what recommendations might come in terms of improving future certification process.

Senator COLLINS. Well, I have many more questions for both you and Mr. Bahrami, but I know that Senator Reed is on a tight time schedule, so I will turn to him.

Senator REED. Thank you, Madam Chairman.

Mr. Bahrami, it seems that to make sense, to me at least, that pilots who fly these aircraft on a day-to-day basis should be involved in the certification process. In fact, day-to-day pilots, if you will, were involved in finding an additional flight control software

issue when they were given access. Going forward, will the FAA reconsider requiring that everyday pilots—I am using the term generically—not just test pilots, play a greater role in aircraft certification?

Mr. BAHRAMI. Senator, thanks for that question.

Pilots and flight test engineers and operational pilots are engaged in certification, and they have always been involved. What you recently heard with respect to the recent findings on the issue was a review of the system safety assessment, and what we found out, that there was a particular failure, which was extremely remote. And we acknowledged that. We understood that.

And based on what we learned from the two accidents, we decided that we need to actually verify the assumptions, and that is where our pilots got involved to, in fact, verify that this particular situation if it occurs, is recoverable. And in that particular case, several of our pilots were able to recover, but there was one or so that they could not recover successfully. And because of that, we said that change needs to occur. So the good news is the pilots are engaged and involved in the process.

Senator REED. But the question is, will they be formally engaged going forward?

Mr. BAHRAMI. Absolutely.

Senator REED. In a much more robust way officially. Not just informally, but officially by the FAA.

Mr. BAHRAMI. Absolutely, sir.

Senator REED. Thank you.

Today, the Wall Street Journal reported, as the chairman indicated, on the situation, and one of their points was that the FAA's early goal after the first crash was to, in their words, get something out immediately and then mandate something more permanent. Specifically, the FAA analysis suggests that a warning to pilots would be enough to provide Boeing about 10 months to design and implement changes to MCAS, according to a person close to the manufacturer. Boeing had been planning to complete the changes by April, within the 10-month period. That is the end of their quote.

This information appears to contradict earlier statements by the FAA. You previously thought notification would be sufficient to remedy safety concerns after Lion Air accident. So, Mr. Bahrami, is this accurate, the report that—did the FAA intend to have a short-term pilot warning, knowing that Boeing needed to make a more significant fix to the MCAS software?

Mr. BAHRAMI. One of the most important roles that we play is continued operational safety. On a daily basis, we get reports from the fleet with respect to events, occurrences, difficulties, whether it is operational or technical, on a regular basis. All of those are reviewed by our engineers and specialists to determine what we need to—first of all, are they really serious safety risks, what we need to be doing in the interim, and at the same time, in the long-term action. And what—this is a normal practice.

In that particular case, based on the data and information that we receive, we recognize that in Lion Air case, pilot action played a significant role. And because of that, we felt that the most important, urgent thing to do until we have appropriate fixes in place,

to provide the pilots with the appropriate procedures to focus on going forward, while we develop this. This is our interim measures. And then the final fix was supposed to occur at the later time.

And this is normal practice. I could give you numerous examples that we have done that.

Senator REED. But the implication was that this pilot change would be sufficient to provide airworthiness, and there was no real mention of improvements and necessary changes of the MCAS system, leading I think most people to conclude that there was no long-term issue with the MCAS. That lack of transparency, I think, is not appropriate.

Mr. BAHRAMI. If I may say, sir, when we get involved in an accident investigation, we get involved for two reasons. Number one, to support the NTSB and investigators with the technical knowledge and information. Number two is to make sure that we understand what we need to do in order to protect the fleet based on the real-time information that we get.

As part of the requirement in our agreement with the NTSB is that we do not disclose information or any indication what may have gone wrong in that particular case, and that is a very delicate balance for us to play. So we wanted to basically resolve the issue without having to disclose information that the investigators did not want us to disclose.

And from the safety perspective, we felt strongly that what we did was adequate, and that was based on discussions with our airlines, our own operators, based on the review of the data that we have obtained from our operators, and also Canadian operators. We thought that was sufficient.

Now, knowing what we know today, and maybe we would have to take a revisit of that based on these reviews that will come out, we will definitely make adjustments.

Senator REED. But of concern is that there are various equities. Companies don't want their planes grounded or even questioned about the safety because that would interfere with the profitability of their operations. The inspectors want to conduct an inspection, isolate as much as possible from the public. But the FAA, we expect you to basically be the person or entity that stands up and says this aircraft is completely safe to fly, that there are no further corrections necessary, or if there are, they are being undertaken. That does not appear to be the case in this situation, but thank you.

Senator COLLINS. Thank you. Senator Durbin.

Senator DURBIN. Thanks, Madam Chair.

During the 35-day Government shutdown, which President Trump initiated earlier this year, I made a point of meeting with air traffic controllers in St. Louis and in Chicago. And I learned that over 3,000 aviation safety professionals had been furloughed during the President's shutdown, and that another 15,000 controllers and aviation safety professionals worked without pay. Many of them were working extraordinarily long shifts to try to make up the difference.

Well, it has been 6 months since the Government reopened, and we are still, I understand, feeling the impacts of that shutdown on our air traffic control system. The air traffic controllers union re-

ports that the shutdown led to early retirements and delayed classes at the FAA Academy, causing some students to drop out.

For an organization that already experienced—experiencing worker shortage and for air traffic controllers who have been forced to work longer hours for too long, the shutdown caused serious damage. And the FAA has reportedly had to lower its hiring target for controllers from 1,400 this year to 900.

The shutdown also negatively affected the implementation of new safety systems, including the arrival prediction alerting system, a safety system that can alert a pilot if they are about to land on the wrong runway and need to circle the airport.

Six months after President Trump's shutdown, can you give us an update on the size and scale of the impacts it had on air traffic control? How much ground did we lose when it comes to air traffic controller hiring and safety upgrades?

Mr. BURLESON. Thank you, Senator, for that question.

And again, I will start with I just want to say I appreciate your acknowledgement of what FAA did. It was pretty extraordinary. I mean, I have been at the agency for 30 years, and I will say this is one of our finest hours; that for 5 weeks, the system ran perfectly, safely, efficiently, where again, a good portion of our workforce was sitting home, and the rest was working without pay.

Senator DURBIN. Bless you, and bless the controllers, but this was totally unnecessary. This was a Government shutdown inspired by one man. Would you continue and tell me today where we stand in terms——

Mr. BURLESON. So, Senator, today—so, again, I think the good news is we have made great progress. Again, there was—again, like any large organization, if you shut it down for 5 weeks, there is going to be some impacts.

I will say in terms of controller targets and training, this year's class is slightly lower. But in terms of overall targets of what we are trying to achieve—and we sent our staffing plan to Congress—you will see that we are still on track in terms of getting to about 14,000 controllers. The composition is a little—slightly different in terms of we have about 3,500 trainees as part of that. But again, there was some delay at the academy, but the classes have restarted, and we certainly are not concerned of making sure that we have the right level of controllers in the system.

We did have some delays in the implementation of a number of the NextGen projects. Again, if you shut down an organization, that is going to happen. I think the good news, again, is we are working to try to schedule waterfalls of how we get different parts of the NextGen systems out in the system, coordinating schedules of our controllers, our technicians. And so, again, there has been some delay, but I am confident we are going to be able to address those issues over the next year and get that work back on track.

Senator DURBIN. Mr. Burleson, I think more than anything, the words "safety" and "FAA" are almost synonymous. That is your reason for being. And the point I hope I have made, and I think you have reinforced, is that Government shutdown compromised the safety of our aviation—at least threatened to compromise the safety of our aviation system. And it wasn't until the air traffic controllers announced that they were going to start slowing down the

traffic at our airports that this Government shutdown finally came to an end.

What you are telling me as well is that many projects that Congress has asked for and you have initiated to make our air traffic or our aviation system even safer have been delayed because of this Government shutdown. This note—I said earlier that the FAA has reportedly lowered its hiring targets for air traffic controllers from 1,400 to 900. We received that information from you. Is that the case?

Mr. BURLESON. So, Senator, yes. The class size this time went down. But again, in terms of what we need for filling controllers overall in our overall target, it is not going to have an appreciable impact.

But let me come back to you, Senator. I have to fundamentally disagree. At no time in that 5 weeks was the aviation system of the United States unsafe.

Senator DURBIN. That is——

Mr. BURLESON. We would not—sir, we would not have allowed——

Senator DURBIN [continuing]. Sir——

Mr. BURLESON [continuing]. the operations——

Senator DURBIN [continuing]. I didn't say that. And I think it was not unsafe because air traffic controllers still on the job were working long hours to try to make up the difference, despite many of them facing the reality of no pay. And I can tell you some specific stories of these air traffic controllers that I met with and the sacrifices and pressure they were under because of that shutdown.

I would like to believe that an air traffic controller is working a normal shift, without that kind of pressure and family pressure, with no paycheck, and doing their job and doing it professionally. I don't think we made it any easier with that Government shutdown. Let me just ask you point blank. Do you? Do you think the Government shutdown made their job easier?

Mr. BURLESON. No, sir. It did not make our controllers' job easier. It did not make our airport inspectors, nor our safety folks—no one—it did not make it easier. All I want to say, sir, is that because of the commitment—and this is what I said in my statement. The men and women of the FAA have an amazing commitment——

Senator DURBIN. Thank goodness they do.

Mr. BURLESON [continuing]. to the safety of the aviation system. And this is what you see in that shutdown, that they reported to work. They did their jobs as the Government sorted out its issues between the Congress and the administration. Our focus is not that. Our focus is making sure the system runs safe every day for Americans.

Senator DURBIN. If you could also give me a report on secondary cockpit barrier progress, I would appreciate that.

Thank you, Madam Chair.

Senator COLLINS. Thank you. Senator Manchin.

Senator MANCHIN. Thank you, Madam Chairman, and thank you all for this hearing.

I am going to get right to the 737 MAX. And I think that, Mr. Bahrami, this will mostly be for you.

It seems like every few months that we are learning something new about the problem. First, it was the MCAS system existed at all. We didn't know about that. It wasn't even included in the pilot's manual.

Second, we learned that changes were made to the MCAS system late in the design process that made the system more powerful, allowing it to push the nose down much more aggressively. Even so, this system relied on the single sensor and had no redundancy.

Third, we learned that the FAA never performed its own assessments of the system, and in fact, that had delegated much of its oversight to the Boeing Company.

We are still in the position to be helpful. We want to be helpful. We need to get these planes moving again. As I—last count I have, 389 planes that have been grounded; 200 built and not even delivered. So we are at 600 planes.

What does that do for the safety of the system right now if we are running planes that should be timed out or maybe should be grounded? Are we running planes longer than they should be run since they are not being replaced? Are we losing a lot of flights, which is a tremendous economic hurt to all areas of the country?

Sir, I question basically our role as the Federal oversight, making sure that the skies are safe, the planes that are going in the skies are safe, people are trained properly, the tach indicator, things of this sort. It is just unbelievable that we got to this position, and we let them—I am understanding it was driven by the industry who did not want to go through the retraining process and try to save an awful lot of money and time just making the transfer of a new plane coming into the system.

So if you can talk to that, sir. I know you are over all of this. I know you started out with 737 MAX. Then you went back to the private sector. Then you came back to the FAA. So if you can explain to me how we got to this position.

Mr. BAHRAMI. Thank you for the question. Sir, you have multiple questions.

Senator MANCHIN. Yes.

Mr. BAHRAMI. And statements in there, and let us just put things in the proper perspective.

Senator MANCHIN. Okay.

Mr. BAHRAMI. Then I will defer to you to tell me where I need to explain certain things more.

Senator MANCHIN. Sure.

Mr. BAHRAMI. First of all, let me talk about myself. I have 40 years in aviation, all of it in large transport. All of it in certification. And I was a designee of the company, and I know what it is to be a designee. It is a badge of honor that once the greatest safety organization in the world tells you that you are trusted to do work on my behalf in terms of data improvement, that is—that is probably the highlight of an individual career.

So I would say that when we talk about delegation, delegation is sound, and over the years we have been able to improve it and get better at it by shifting from individual designees to organizational delegation. And to the point that we are today, it is supposed to be the most comprehensive, and in terms of oversight, systems—system oversight. That is our focus.

So I—the reason I did go to—there is a write-up on it. I went back to industry. I come back. And I spent 25 years at the FAA in charge of large transports in Seattle, was based in Seattle.

Senator MANCHIN. If I can just direct, because time—I know—if I can just go over a little bit. This was a complex plane. Okay? You hung new engines on, you did a lot of different things with a software system that wasn't even mentioned in the pilot's manual. It wasn't even mentioned in the pilot's manual, and yet the FAA agreed that pilots only needed an hour of iPad training to get up to speed. That is incomprehensible to me, to be in that position, when we did a complete makeover, basically using the same air frame, but we changed the whole dynamics of that plane to perform differently.

Mr. BAHRAMI. The pilot training, that is a great question. The pilot training decision is not made by one individual or one inspector or pilot in the FAA. It is done through a process which is called flight standardization board.

Senator MANCHIN. Is that under you all, the FAA?

Mr. BAHRAMI. Yes

Senator MANCHIN. Well, here is the other thing on that. The biggest selling point for the MAX was that it would require minimum pilot training, and Boeing promised Southwest millions of dollars in rebates if the MAX required simulator training.

Mr. BAHRAMI. If I may?

Senator MANCHIN. You already basically eliminated simulator training, didn't think it was needed, to basically adhere to what Southwest demands were.

Mr. BAHRAMI. If I may finish.

Senator MANCHIN. Sure. I am sorry.

Mr. BAHRAMI. No, that is okay. What I wanted to point out was that when we have a new design, whether it is a derivative or a new model, the pilots, including line pilots, people for the airline, they get together as part of this group and they see what changes are made to the flight deck. They compared it to the previous model. And then they go through the training syllabus and make a decision whether—what type of training is needed. It was the decision of that body that says that this MCAS training, this computer-based training is sufficient.

I am not a pilot, but I can tell you that from human factors perspective, you want to make sure you provide the pilots with sufficient information to be able to control the aircraft, but you don't want to overwhelm them with all kinds of information that may not be relevant. An MCAS system was supposed to be a system that works in the background, and it should be transparent to the flight crews. That was the logic.

Now, knowing what we know today and what Acting Administrator Elwell has said, we should have included more description in the computer-based training in order to explain what MCAS is and what it will do. So what we should be focusing on—and I am going to do that, and that is what the team is doing—is a better appreciation and understanding of system safety assessment, ramifications of various failures and things like that.

Senator MANCHIN. Are we doing investigations into this agency that is supposed to have the oversight of the training? I am a pilot.

So the only thing I know is that I am flying IFR and I think that I have got to override the autopilot, I have got a couple switches to flip, and I am overriding my autopilot. I mean, that is the first thing that I have learned.

When I go back to pilot training, the same thing. I am being basically trained in case of an emergency. I already know how to fly the plane. I want to know what happens if I have to try to fly through an emergency.

Mr. BAHRAMI. That is right.

Senator MANCHIN. And for some reason, these two pilots, I guess the foreign pilots had no idea they could turn the system off?

Mr. BAHRAMI. Sir, thank you very much. That is a very important point you are making.

In an age—in our business, in the business of safety, you want to be focused on the issues that you need to focus on and help things—make things better. I do not want to pass judgment on the qualification of the pilots that were on those flights, but I will say, a review of the flight data recorder and the preliminary information and what we know, the actions they took was inconsistent with what you would think.

Senator MANCHIN. Let me just say and I will wrap this up.

Mr. BAHRAMI. That was an issue, that we were——

Senator MANCHIN. Thank you for being so kind, Madam Chairman, but I want to wrap up by saying this. We have relied on the industry more than we should rely on the industry to do the job that we should do to make sure that the American public is safe.

I would say for the 737 MAX to get back into the air, every Boeing official should be flying that plane for 1 month to make sure that we have the confidence for a passenger to get back on that plane. I am not getting on the 737 MAX until I see the president of Boeing and all of his and her associates be on that plane first and fly for any substantial time.

Mr. BAHRAMI [continuing]. We absolutely agree that it is necessary for us to do everything we can to gain the confidence of the flying public. And let me assure you that most of my time at this point, talking to foreign authorities, talking with the airlines' executives, talking to labor unions, is to make sure that when we are there, all along they understand how we got to where we are, and what we have done is the right safety action.

Senator COLLINS. Thank you, sir.

Mr. BAHRAMI. Thank you.

Senator COLLINS. Senator Boozman.

Senator BOOZMAN. Thank you, Madam Chair, for holding this hearing, which is so important.

I would like to talk about a few things that are important, not that these others aren't. You know, that is the nice thing about having you all is we can talk about a variety of issues, but some things that area really important to all of our States. One of those is the contract tower program.

Mr. Burleson, I think it is one of the most successful Government-industry partnerships that we have and, as you well know, has a very strong bipartisan, bicameral support in Congress. It is validated numerous times by the Department of Transportation Inspector General. The program continues to provide high-quality,

cost-effective, and critical air traffic control services to over 250 smaller airports throughout our Nation's transportation system, including five in Arkansas.

Given the critical importance of contract towers to rural Americans, smaller airports, what steps are the Department and FAA taking to work collaboratively with industry to ensure the continued success of rural airports that depend on our contract towers?

Mr. BURLESON. Senator, thank you for that question.

And FAA, we absolutely agree that this is an incredibly important and efficient program in terms of providing air traffic services to large parts of the county. Currently, we have, I guess, in the President's budget going forward is $169 million is proposed for contract towers. From our assessment, that appears to cover the existing contract towers in the program, as well as it appears to cover what—the new applicants that are coming our way.

In terms of the steps we have taken recently, in June of this year, we reopened the application process for contract towers, and we currently have, I believe, six new applicants, sir, that are going through the process of review. We are also—based on the congressional direction, we are doing all the cost-benefit analyses that are required for both the new entrants and the Cost Share towers. Those will be accomplished by September of this year.

I know there is also an issue we are seeing in terms of staffing challenges. Part of it is because a lot of the controllers are now—we are recruiting them. It potentially is creating some challenges for some of the vendors of contract towers. So our air traffic organization is holding discussions with them to see are there ways that we can try to address and help in this area.

Senator BOOZMAN. Very good. On April 9, 2018, the Department of Transportation signed an MOU implementing Executive Order 13807, also known as the One Federal Decision Framework. The framework signals a continued emphasis by the Trump administration on expediting infrastructure project reviews by requiring improved coordination among all Federal agencies within a single process.

Mr. Burleson, understanding this is a relatively new framework, has the One Federal Decision had an impact on streamlining approvals thus far?

Mr. BURLESON. So, thank you for the question, Senator.

So, again, I would actually defer to Winsome Lenfert, who is our Head of Airports, who has a lot more experience in the environmental world and might be able to——

Senator BOOZMAN. She looks like she knows the answer.

Mr. BURLESON. She seems to know the answer, yes, sir.

Ms. LENFERT. Thank you, Senator, for that question.

And I would actually like to recognize that the Office of Airports and the overall entire FAA has actually been working very hard to streamline environmental processes for many years. So we appreciate the executive order that was put in place. It just increases the Government-wide emphasis on this streamlining.

So we work very closely in doing a lot of planning up front in a project and then working very closely with the airport sponsor to ensure that we are implementing the environmental requirements in the executive order. But we also have to strike a balance in that,

in that we make sure that we are following our environmental due diligence in a thorough review of the projects, while ensuring that we are implementing our infrastructure projects.

Senator BOOZMAN. Very good. So things are moving forward. You are having some success. This is so important. We struggle with the debt, the deficit. This is an area that actually would save a lot of money. And we don't want to shortchange any of the environmental considerations or anything else, the safety considerations, but we do want to make sure that we work together. Are there any improvements that we can help with as far as helping you in that regard?

Ms. LENFERT. Not at this time. I think one of the things that was approved in the recent reauthorization is Section 163, which actually allows us to look at a project and make a determination that there is minimal Federal impact required, especially on non-aeronautical development on an airport. And we have been very successful with this program. So far, there have been about 25 different projects throughout the country where we have had to do minimal review, and the airports are going forward and putting the projects in place with minimal environmental and Federal oversight.

Some of the projects example is in Lafayette, Indiana. They were able to go forward and to put in an industrial research park with minimal Federal oversight and environmental review. Spokane, Washington, is also another one that we recently did.

Senator BOOZMAN. Very good. Thank you, Madam Chair.

Senator COLLINS. Thank you. Senator Hoeven.

Senator HOEVEN. Thank you, Madam Chair.

Administrator Bahrami, could you provide me with a—you know, you and I had a conversation last week. I appreciate that very much. As you know, we are working on some things at our Northern Plains test site at Grand Forks, North Dakota, and one of those we work very hard on is Beyond Visual Line of Sight. And so I am wondering, do you have a list of milestones or specifics that we would need in order to approve the BVLOS, the Beyond Visual Line of Sight, flights without chase planes?

I mean, have we gotten to those specifics that they need? Because, as you know, we have worked on this very diligently, put a tremendous amount of resources in place, and we need to know what is required to finish that up so we are doing it on a routine basis.

Mr. BAHRAMI. Thank you, Senator.

First of all, I want to thank you for the opportunity to talk to you about this just recently. As I said on the phone the other day, we have a very, very strong partnership with North Dakota, the test site, and they are supporting us in so many different ways, frankly, numerous projects.

As you know, they are engaged in the integration pilot program. They are engaged in supporting us for Operation Beyond Visual Line of Sight. They are also working on No Chase Certificate of Waiver or Authorization (COA) currently with General Atomics.

And as I committed to you, with respect to the Beyond Visual Line of Sight, specifically the company with Excel Energy, I committed to you that we will have this result and changes made by

end of this week. I was informed actually this morning before I came here that we made progress, and we are going to be communicating that to the test site. And they will be—with this decision, they will be able to eliminate the observers that was a costly aspect of that. That is one issue that I was told this morning, which resolved the concern they had.

With respect to the No Chase COA, the issue there is work and coordination between several air traffic centers. And today, there is a meeting that is taking place to talk about that with the test site officials, and there will be the follow-on discussion with General Atomics.

I guess what I am trying to point out is I will be happy to provide you a list of all of the projects, but frankly, these are the two most important ones that were both—that were brought up, brought to our attention, and we have already taken actions on those.

Senator HOEVEN. That is good. The key is understanding what they are and the timeline, and our people will work through it with you. And I want to take the opportunity to thank not only yourself, but Mr. Burleson and the others for the relationship that we have with the FAA. And we are trying to keep these things moving along, so we just want to make sure we understand exactly what the requirements are and that we have some timelines we can set to achieve them.

Mr. BAHRAMI. Sir, if I may say, one important thing in honoring your partnership is to keeping commitments. I totally understand that. And the appreciation of our mission, which is safety, and making sure that we balance safety and innovation appropriately. That is where we need the input and the data and the expertise that the tech center will bring to us, and we definitely welcome that.

Senator HOEVEN. Okay. Thank you.

And then Ms. Stubblefield, thanks for traveling to see our UAS operations. We appreciate that. I guess questions I would have for you in regard to—when do you expect to complete the current rulemaking process on remote identification for UAS?

Ms. STUBBLEFIELD. So, thank you for that question, Senator Hoeven, and I very much appreciated the trip out to North Dakota. It was very instructional to talk with the UAS test site and the folks out there.

The remote identification rule is the top priority for the FAA on UAS rulemaking. It is an extremely complex rule, and it is a rule that requires not only the rule itself, but several other pieces that we have been working on. So we are working very hard to publish that rule this year.

But it is important to remember a couple of things as we talk about probably some of your frustration with the timeline. One is the fact that, up until October of last year, the FAA did not have the authority over all UAS operators in the airspace, and we are extremely grateful to Congress for restoring the FAA's authority over all UAS operators, in particular the recreational operators.

Before that time, we were struggling with putting together a rule that really addressed what needs to occur in the airspace with remote identification to take advantage of that from the security per-

spective, the safety perspective, and enabling integration. Once we had that authority, we were able to move forward in really building out the rule.

But there are also two other facets that have to come together to actually enable remote identification implementation in the airspace. One is standards, and there are several industry groups that the FAA is supporting in putting together industry standards that will be necessary to execute the rule. And then on top of that is the infrastructure piece. So when that remote ID requirement is out there, how will that information be transmitted? How will it be communicated to law enforcement and other security partners?

That infrastructure has to be built out. And we have had an RFI out on the street since December to get a cadre of industry to start working on that. So the goal is, when the rule comes out, we have the standards we need and the infrastructure in place to execute those altogether.

And on top of that, we are also—in June, our Drone Advisory Committee sought—or is seeking input on a 90-day timeframe to have the DAC members, who are industry, State and local law enforcement, State and local government, other aviation industry players, coming together to talk about how we can incentivize early equipage of remote identification so that we can take advantage of that as quickly as possible.

Senator HOEVEN. Thank you. Madam Chair, I do have some additional questions. Are you going to have another round?

Senator COLLINS. We are. Thank you. Senator Murray.

Senator MURRAY. Thank you very much, Chairman Collins and Ranking Member Reed. I appreciate your work on this.

And before I ask my questions, I do want to note that my top priority here is the safety of the flying community, and I know FAA is working to resolve the many aviation safety challenges we are currently facing, including the recertification and oversight efforts that are ongoing with the Boeing 737 MAX planes.

I understand the work of the multi-agency Technical Advisory Board is well underway. I look forward to their findings, as well as those of the FAA. And I would just ask all of you to continue to work as transparently as possible to keep members of Congress in the loop as new information becomes available and developments occur so that we can prevent future tragedies. I know this issue has already been talked about here, so I won't ask any questions about it, I am following it extremely closely.

The question I did want to ask today is the issue of sexual assault on airplanes. This is an issue that I have been working on for a long time because I heard from constituents who were sexually assaulted during flights, and they experienced a complete lack of information as to how to respond or who to report to, what would happen next.

So both the fiscal year 2018 appropriations bill and the FAA Reauthorization Act required DOT to work with relevant Federal agencies and other stakeholders, including sexual assault survivors themselves and representatives from the flight attendants, airports, and air carriers, to establish a task force that would address sexual misconduct on airplanes. I am really glad the task force has

started its work, and I hope it will work with all of those stakeholders to recommend swift, effective action.

But I wanted to ask you, Mr. Burleson, today, how is the FAA working with DOT and the Office of the Secretary on this task force?

Mr. BURLESON. Thank you, Senator, again, for raising this question because this is a very important issue. Certainly no one should be exposed to the risk of sexual assault taking a flight.

Again, as you noted, Congress has set up provisions where the Office of the Secretary is leading this effort. FAA is cooperating with that task force. And again, we are really waiting for the outcome of that task force to decide how we can best adopt the recommendations, both in terms of both the general prescriptions, as well as I know the Attorney General is also working across Federal agencies to decide how best to collect some of the metrics. So, again, we stand by to, based on the recommendations that come out of that task force, to figure out how best to adopt that in the aviation system.

Senator MURRAY. Okay. Well, I know that the FAA issues regulations, advisory circulars, guidance to air carriers, all related to cabin safety. So outside the task force and waiting for a task force to complete its work, are you undertaking any efforts at the FAA to deal with this issue?

Mr. BURLESON. Senator, I know we have collected some basic data to try to help provide information. But again, there has been at least one meeting already of the task force. So, again, I know it is working at pace, and so, again, we are waiting to see what we can do.

Now, again, we take the normal—as flights happen in the system, we, again, work very closely with the normal law enforcement community as issues are reported to try to do as much as we can to ensure that law enforcement officials meet the plane, things are dealt with. But again, in terms of a larger strategic effort, we are awaiting the recommendations of the task force.

Senator MURRAY. Okay. Well, this is a critical issue, and waiting means somebody is going to have an issue between now and when a task force comes back. So I encourage you to keep this top of mind.

Let me pivot quickly. There are seven contract towers in my home State of Washington, and these towers, like all the other 250 contract towers in the country, support a wide array of critical aviation operations, like scheduled passenger and cargo airline service. They do Medevac, military. They do aerial firefighting, aircraft manufacturing, corporate and general aviation, just a wide range of things.

And I wanted to ask you, given the workforce challenge that is confronting the aviation industry, including the hiring of air traffic controllers into the FAA, I understand that many of these contract controllers are being drawn from the contract towers at rates high enough to cause challenges for the contractors in the program. This has created a really growing concern in the airports that they serve and have led to some questions about whether contract towers will be actually fully staffed. So I wanted to ask you what steps are

being taken by the FAA to work perhaps collaboratively with the contractors in industry to make sure they have full staffing levels?

Mr. BURLESON. Thank you, Senator.

So as I had shared to an earlier question, we are very firm supporters of the contract tower program, and this issue of staffing has come up. Again, it is of concern to us. We want to make sure that there are the right staffing available for vendors that actually man these towers. So our air traffic organization is actually having discussions to try to explore what options we might have in terms of workforce.

Workforce generally is a very important issue for us. We have taken a number of steps in the FAA to try to tackle this broader issue of the aviation workforce going forward. You probably have seen some of the reports that over the next 20 years, we need 600,000 pilots, probably almost equal amounts of technicians. We need new kinds of skill sets.

So we held a summit last September with industry and academia, unions, to start tackling this issue. FAA has formed a task force inside the agency, and we are really working to try to figure out how do we expand the pipeline of interesting the next men and women in aviation careers, how do we target the right kinds of proficiency and skills in the training process, and how do we partner with both education and industry to try to make aviation careers attractive? So we are working very hard at this.

Senator MURRAY. So you have a task force. Are you going to bring recommendations to us? Is there policy things or funding things we need to be focused on?

Mr. BURLESON. We are, at this point, that is actually part of what we are working through in terms of how best to do some of these activities. We will have going forward, I suspect we will have some recommendations. At this point, we are doing a lot of assessment of how best to deal with some of these issues in terms of pipelines, proficiencies and partnership.

But again, this is a very top priority because, again, the heart of aviation being successful in America really has relied on the workforce, whether it is working for us in the FAA or with industry. So, again, we see this as critical, both for the vitality, as well as the safety of the system.

Senator MURRAY. Okay. I appreciate that and look forward to your recommendations, hopefully sooner rather than later.

Thank you.

Senator COLLINS. Thank you.

Mr. Bahrami, I want to follow up on the line of questioning that I began in the first round. I would ask that you bring your mike a little bit closer to you so that we may hear you more clearly.

The New York Times story that I mentioned asserted that at one point in the certification process, FAA managers conceded that the MAX did not meet agency guidelines for protecting flight controls. But then the FAA considered whether any requested changes would interfere with Boeing's timeline, and FAA managers wrote that, "It would be impractical at this late point in the program for the company to resolve the issue."

I have two questions for you. First, is that accurate? And second, should FAA managers and engineers be concerned about Boeing's

production timeline when making decisions that are related to safety?

Mr. BAHRAMI. First of all, that is not correct. In every certification program, there is debate, dialogue exchange, with respect to compliance with the specific regulations. As you know, some regulations are very prescriptive. Frankly, those are the easy ones to find compliance to because it is either this or not.

There are others that are very subjective. And in some cases, those regulations often are debated and discussed tremendously in a period of a 1-year, 2-year timeframe. And I have seen in my career certifying programs like 787, Airbus A380 and others since 777, I have seen those situations occur. That is why we put in place processes. That is why we put a process where we get the appropriate people get together, discuss the facts and information.

In that particular case that you are referring to, there were prior discussions as part of the process that the documentation of that particular action was taken. Several folks were not happy with that. That issue, again, was elevated and went through a prototype process that we put in place. And after that, based on all the data, managers made the decision, and the decision that was made, it was not necessarily to the liking of one or two individuals.

Frankly, that is what I get paid for. That is what managers get paid for: To look at the data, fact, and information and make the decisions, and those are very tough issues that we need to deal with. In my view, the process was followed, and I would definitely look forward to all these different reviews that are being conducted, for them to take a look at it again to see if we could have done anything differently or there are areas that there are shortcomings in.

Senator COLLINS. So is your testimony that pressure from a manufacturer to meet its deadlines for production has no impact at all on the decisions that you make with regard to safety?

Mr. BAHRAMI. When it comes to safety, absolutely. Safety is number one. That is what we focus on.

Senator COLLINS. Well, let me follow up on Senator Reed's question about the article in the Wall Street Journal this morning. According to this press account, after the Ethiopian Air crash, FAA's internal analysis found that the underlying risks of the MCAS were unacceptably high, and that they exceeded internal FAA safety standards.

Now, in the past when FAA has found that an aircraft poses an unacceptably high safety risk, it has mandated equipment changes, inspections, or training. But in this case, what FAA appears to have done is simply to issue a reminder to pilots on how to respond to an MCAS malfunction, and FAA gave Boeing many months to fix the underlying issue. What troubles me about this is, if the agency's own analysis found MCAS to be an unacceptable risk, why did the FAA not take immediate action to address those risks?

Mr. BAHRAMI. So I just want to make sure, just a clarification. The discussion that we had was concerning the events after the Lion Air, not the Ethiopian Airlines. Ethiopian Airlines, we understand what happened in that case, and shortly after we get the facts and data and information, we grounded the fleet.

On the Lion Air situation, when you say a reminder and notifications to the pilots or air flight crews, we do that through airworthi-

ness directives. Airworthiness directives are laws. They are not just reminders. They have to comply with that.

And typically what happens in case of a procedure or a change or focus on a particular process, a copy of the airworthiness directive actually put in, in the flight book for the pilot, so they know that this is something they need to be mindful of. So it is not just a notification be aware this is an issue, it is there for them to act upon should they encounter that issue.

So that was an interim action. We knew that eventual solution would be to have the modification, and based on our risk assessment, we felt that we have sufficient time to be able to do the modification, you know, and get the final fix, what that means, typically, when we have refer to it as closing action. Closing action basically eliminates all the interim actions, removes that particular piece of paper from the flight manual, and then the MCAS modifications are incorporated. So those processes are what we use, and we did the same in this particular case.

Senator COLLINS. Of course, and I will yield to Senator Reed, but one issue here, which Senator Manchin mentioned, is that MCAS wasn't in the original manual, which seems very strange.

Senator Reed.

Senator REED. Thank you very much, Ms. Chairman.

Mr. Burleson, you are aware that the Department of Transportation IG is conducting a review of certain air carriers' management and maintenance programs, and we understand that they have developed a systemic concern that FAA is transitioning from a strategy that emphasized enforcement to one that is more relaxed in terms of compliance. And they have also indicated that questions arose about the agency's ability to effectively document maintenance issues and identify persistent problems with trends over time as a result of this new approach.

And as I indicated in my opening statement, they contend FAA guidance even allows inspectors to close out compliance actions without ensuring that corrective action has been implemented and is effective.

Given all these comments, can you explain how the FAA is mitigating safety risks and holding air carriers accountable to appropriately maintain the fleet with this sort of relaxed approach?

Mr. BURLESON. Thank you, Senator, for the question.

And what I would like to do is set a larger historical context and then let my colleague, Mr. Bahrami, talk specifically about the maintenance issues with the IG report.

So, again, where we have arrived today in the compliance program is all about how do we identify risk and deal with safety proactively. And again, it is not a matter of relaxed enforcement. We still take enforcement, if you cannot meet the standards, if you cannot comply to our safe operation, we will take appropriate action. And again, this was a process that has been developed over two decades.

Again, I have been so long at the FAA, I remember back in the '90s when we were facing significant challenge with the growth of air traffic and the accident rates we were facing, potentially, we were going to face worldwide an accident every other week. And so

this clearly wasn't going to be acceptable for the aviation industry. So we had to find a different approach.

And so this is what has developed the whole process of working closely, more closely, to provide information from industry. In fact, Congress was a critical part of that, of setting up the voluntary reporting system. So this is how we have developed in the commercial aviation safety team this process of being able to access information that before wasn't disclosed to us and to be able to take action toward compliance. Now, again, that doesn't mean we don't do enforcement when there is egregious or criminal behavior.

So, again, I think when you look at the results in the last two decades and see where we were in accident rates in the '90s versus where we are today as we said earlier, we had one fatality over 10 years, 90 million flights, 7 billion passengers. That is quite extraordinary.

So I would say the approach we started in the '90s and gradually developed has been successful. That said, it doesn't mean that there are not improvements. And again, we continue to try to work, and certainly the IG, we appreciate his input in terms of the program on the maintenance. And let me turn to Mr. Bahrami so he can elucidate there.

Mr. BAHRAMI. I just want to give you a number, and that number is 23,000. And from 2015, when the compliance program went into effect, until recently, those are the number of compliance actions that have been identified and corrected in the system. I can assure you that it is virtually impossible for any audit to be able to get to that many number of findings throughout the system because no matter what we do, we go out and look at areas that we have traditionally had problems.

If you look at the iceberg analogy, what we did in the past, we only saw the tip of the iceberg. That was regulatory area and audits. What we are doing with the compliance program, we are actually getting below the waterline, and we are getting into areas that we have not necessarily been able to get into or do not have the knowledge to be able to understand because a lot of those issues come through operational understanding and the details of operation. So I believe that our compliance program has been very effective and will continue to be effective.

And the other point that I want to point out, I am very thankful for the recommendations that came from the IG. And in fact, GAO is also conducting a review of the effectiveness of the compliance program. An area that you mentioned, which is follow-through of the closure action, documentation of that, that is an area of focus. In fact, we are revisiting our training in that area because in certain sectors of aviation, specifically GA, we have to do some work and get better.

Senator REED. And I think the committee would be well-informed if you could get back to us when the report is official, indicating what corrective action you have taken in response and any issues you have. Because, again, when it comes to safety, I don't have to remind this panel, you can't do enough.

And I just want to thank Ms. Stubblefield and Ms. Lenfert. Ms. Lenfert, thank you for your help at T.F. Green Airport. And as you

have learned, good work is rewarded by more work. We will be back.

Thank you.

Senator COLLINS. Thank you.

Senator Capito.

Senator CAPITO. Thank you, Madam Chair, and I want to thank you all. I apologize for coming in early and then having to leave. We had a markup in Commerce Committee, and I was unable to hear all of your statements. So I apologize for that.

I first want to begin with a thank-you to the FAA. We had an issue with our EMAS, which is our emergency system at Yeager Airport. I see some nodding heads in Charleston, West Virginia. We had a hillside collapse in 2015, which wiped out our emergency runway overrun area, and we actually had to do literally an act of Congress so that we were able to secure the grants to replace. We just had the final ribbon cutting of the final EMAS, which will allow for a lot of safety issues.

If you have flown into Yeager, you know it is right on the top of three mountains, actually. And having that safety stop there, overrun area, is critically important for us to have bigger planes coming in. And so I just want to thank you all for all the work that you did with our offices to make sure that happened, and with our local county commission and our airport board.

I do want to ask a question, and since I missed a lot of the testimony, I apologize if this has already been covered. But in the last hearing on the Commerce Committee on March 27th, I asked about pilot training and the airworthiness directive that was issued between the Lion Air and Ethiopian Air airline crashes. I guess I am surmising that recent reports have noticed that more stringent simulator testing has helped to identify a separate software issue.

And maybe this isn't the best forum to ask this question, but hindsight is always really great. If you look at what you did after the Lion Air crash and then what you have done subsequent, after this subsequent crash, after Ethiopian, would more simulator training or more simulator exercises after Lion Air been able to have been—shown some of these things to light? So I am just kind of throwing that question out because I have always wondered. Two is different than one, and if you had been more aggressive and gone all out after the first crash, would we have had maybe some better information?

Mr. BAHRAMI. Thank you for that question, Senator.

First, I want to go back to your comment about it was true the simulator flight tests or testing was that we found out these other anomalies or shortcomings in the design. That is not correct. Let me tell you why.

What happened was, through the system safety assessment, and because of the accident and the thorough work that we are doing today, including three other authorities—we have got Europeans, we have got Canadians, and we have got Brazilian colleagues supporting us in this review. And based on the data from the preliminary accident reports, we recognize that some of the actions that those flight crews took was inconsistent with what we assumed would be the appropriate action, which becomes a function of airmanship and air monitoring.

What happened recently, what you read about, was that we identified a very remote failure case. And at that time, we said, you know, knowing what we know, we really need to go back and see if this occurs, can flight crews recover? And that is how we ended up going into the simulator, to model that particular scenario and see how the pilots react.

Once we did that, we recognized, and it was the decision by our test pilots, that the level of proficiency that is required for this to recover from this event is exceptional. And because of that, we could not leave the decision, to leave it as is and don't make the changes. That is why we made the design changes, why the software changes are being incorporated.

So the simulator was not the one that identified the issue. It was the actual system safety assessment that identified a vulnerability that we had to verify as part of our flight simulator testing.

Senator CAPITO. So then it goes into the simulator as a scenario.

Mr. BAHRAMI. That is correct. So we run it in the engineering simulator. And the difference between the regular training simulator and engineering simulator, on the engineering case, you have the flexibility to actually change certain systems, where you can't do it in a regular simulator for training. So we have a lot of latitude in there, and we exercise those latitude engineering cab and we will be able to do this. So I would say that the decision to verify the assumption was based on the information we gathered from the two accidents.

Senator CAPITO. Thank you.

Mr. BAHRAMI. Thank you.

Senator COLLINS. Thank you. Senator Boozman, do you have any further questions?

Senator Hoeven.

Senator HOEVEN. Thank you, Madam Chairman.

I had a couple more questions that I wanted to follow up on with Ms. Lenfert regarding some of our airports. In 2004, the FAA was scheduled to upgrade the ASR–8 in Bismarck to the digital ASR–11. However, that didn't happen. But the City of Bismarck wants to move forward with commercial development close to the airport, and so they need help in terms of relocating the existing radar to a suitable location that will allow for commercial development around the airport.

So I know you are not purchasing more of the digital ASR–11 radar systems, but will you work with us and the City of Bismarck and the Bismarck Airport in order to accommodate that commercial growth and expansion?

Ms. LENFERT. So on that particular subject, Senator, Mr. Burleson would probably be better to handle that. That is actually air traffic organization.

Senator HOEVEN. Okay. Well, then I will direct the traffic to Administrator Burleson. Thank you very much.

Mr. BURLESON. Thank you, Senator.

So, again, we understand the desire to move the ASR–8, and as you said, we have some challenges because that system is no longer even being produced. We at one time thought about replacing it with the ASR–11. The needs have changed.

Now again, if the airport is interested in moving it, we have a number of agreements across the country, which we have entered into with airport authorities where, since we don't have an operational need, we really can't pay for it. But if the airport is interested, we are more than willing to work with the airport if they are willing to pay for the move.

It will create a bit of a challenge with a temporary radar, but I have talked to our air traffic folks. They are willing to explore options of how there is a willingness to pay for the move, a right site found, to try to work out a temporary solution for the radar while we move the ASR–8.

Senator HOEVEN. Okay. Thank you.

At the University of North Dakota, we have a large flight training school, as you know, so that is actually one of the 25 busiest airports in the country—people don't realize it because they have more than 100 aircraft at the university there. And UND students flew over 100,000 hours at the airport last year alone.

So they have a master plan that they are working on, and I want to know that if the FAA will continue to work with the Grand Forks Airport to continue to ensure that the airport's master plan is finalized and that the expansion project that they are undertaking is green lit so that they can continue to not only conduct the existing flights, but to grow. Ms. Lenfert, is this one you want to take?

Ms. LENFERT. Yes. I can take this one, absolutely.

Senator HOEVEN. Great.

Ms. LENFERT. Thank you for the question, Senator.

We are actually working very closely with the Grand Forks Airport, and actually, I am very familiar with this project. I recently met with the airport director and representatives from the University of North Dakota, and we went through the whole project from beginning to end. We are working very closely with them on their master plan, and we hope to have their airport layout plan signed and approved in August.

Senator HOEVEN. Oh, that is good.

Ms. LENFERT. So, hopefully, next month.

Senator HOEVEN. That is pretty quick.

Ms. LENFERT. Yeah.

Senator HOEVEN. Alrighty then.

Ms. LENFERT. They have been doing their homework.

Senator CAPITO. That is tomorrow.

Senator HOEVEN. Yeah. Tomorrow is good.

[Laughter.]

Ms. LENFERT. So we hope. We are getting close. And then we will be working with them closely to develop an environmental review once the ALP and master plan is approved. And then we will be working with them on a potential funding plan once we get through the environmental.

Senator HOEVEN. Well, I am glad I directed that question to you. How about the air traffic control tower? That is part of it, too.

Ms. LENFERT. So I believe that we are going to start the design on the air traffic control tower in August, and then once the design is complete, we will be looking for further funding for the actual construction after that point.

Senator HOEVEN. All right. Thank you very much.

Senator COLLINS. Thank you.

We are going to do one final round of questions. I know Senator Capito has one that she would like to ask right now before she leaves.

Senator CAPITO. Thank you. Thank you.

I just had one additional question, and it is a little bit along the lines of what Senator Hoeven was talking about. We have two schools at Fairmont State and Marshall, which have aviation schools. I guess they are called the CTI Schools, Collegiate Training Initiative.

In our ATC Hiring Reform Act, we did say that you could hire out of giving prioritization to graduates of these schools for air traffic controllers. What is the FAA doing—because we always hear about the pilot shortage and how difficult that is? What are you doing to help schools either stand up these college training initiatives or what kind of, in general, help can we do to address this challenge through our aviation schools that are just beginning?

Mr. BURLESON. So, Senator, thank you for the question.

Again, controllers are vital to the workforce, and we actually have had staff talking with Congress on the act legislation. And we do think—we certainly want to cooperate with you because we do think it could be helpful.

I think you missed earlier. I made some remarks, to just frame a larger issue, that the aviation workforce broadly across not just controllers, but pilots, technicians, we are very concerned.

Senator CAPITO. I was talking more about the pilots, yea, so go ahead.

Mr. BURLESON. So, the pilots—we are very concerned about the future workforce. We are taking a number of steps to work to try to broaden the pipeline of young people into the workforce, as well as improve proficiency and training, as well as cooperate with education institutions like you were citing.

We are working very diligently to try to lay out frameworks. Our regional administrators have been doing a lot of outreach recently. We have I think we have increased almost four-fold the number of activities locally to try to encourage future aviation professionals. So, again, we are very interested in this area and certainly we would be glad to talk with you and your staff as a follow-up.

Senator CAPITO. Thank you. Thank you.

Senator COLLINS. Thank you.

I am going to switch now just quickly to two issues that affect the State of Maine. And Ms. Lenfert, this question is for you.

At the budget hearing with Senator Chao in March, I described an accident that occurred at an airport in Presque Isle, Maine, in northern Maine, where a commuter airplane hit the ground, bounced numerous times, injured three individuals, terrified everyone on the plane, and the plane itself sustained substantial damage. And the Secretary committed with us to working to improve the safety at the airport.

I know that you have been instrumental in helping the airport to secure some funds for better snow removal equipment. But we have a problem when you have a severe weather condition in a small airport like this. So could you provide us with an update on

what else FAA is exploring to improve the safety of this regional airport?

Ms. LENFERT. Thank you, Senator, for that important question.

To note, to follow up on your request for Secretary Chao, the FAA has, in fact, made satellite-based procedures available at the airport. And so we are also currently continuing our investigation of this particular accident and looking and working with our air traffic partners, working with the actual operators, the NTSB, and other parts of the FAA to determine what were all of the causal factors in this particular accident. As you know, it is normally not just one particular incident that causes the accident.

In the meantime, we are actually preparing to working with the airport to prepare them for this upcoming winter season. As you mentioned, we worked with them to procure additional snow removal equipment, as well as work with them on their aircraft rescue and firefighting. Once the final investigation is completed, we will continue to work with them, as we do all airports, to ensure that they have a safe and efficient operation.

Senator COLLINS. Thank you very much, and thank you for your assistance in that matter.

Mr. Burleson if this question shouldn't be directed to you, feel free to pass it off to one of your colleagues. I am hearing a lot of complaints from my constituents in South Portland about increased noise from aircraft landing above their homes at night, often just 600 to 1,000 feet above their homes. While most aircraft use the harbor visual approach over Casco Bay during the daytime, they cannot rely on visual ground references at nighttime. And instead, they have to fly directly over the city of South Portland.

The Portland Jetport has submitted to the FAA a request for a new Required Navigational Performance, or RNP, approach to provide another option for incoming flights that would approximate the harbor visual route at nighttime. Now, the FAA claims that very few of the aircraft coming into Portland have the proper equipment to be able to use an RNP. However, according to the airport director, if you take into consideration the fact that only commercial aircraft are causing the noise complaints at night, more than 21 percent of the aircraft would be able to use this new approach.

I am seeking from you a commitment to take a hard look at this and to consider working with the Portland Jetport to get the RNP approach approved as quickly as possible, or if that is not the right answer, help us come up with the right answer to deal with this noise problem for the residents of South Portland.

Mr. BURLESON. Senator, I am glad to make that commitment. Again, I was provided the same information, that only about 8 percent of the aircraft are capable of an RNP approach. I will say, I understand that our air traffic folks have gone back to the noise roundtable with another proposal, which is to potentially change some waypoints on the existing procedures to see if that might also help address noise, given the problem of equipage.

But again, we recognize aircraft noise can be a considerable problem with local communities. We certainly are taking a lot of steps nationally to increasing technology insertion into the fleets, better community roundtables, trying to take advantage of some of the

NextGen technologies to reduce noise. So, again, I am glad to commit to work with the roundtable to see what might be possible.

Senator COLLINS. Thank you. I really appreciate that. And as I said, the jetport tells me that when you look at the fact that it is the commercial aircraft that are creating the noise, that the number who could use this new approach is actually 21 percent. So that could make a significant difference. But you have a lot of expertise in this area, and I very much appreciate your commitment to work with the community and with the jetport.

Senator Reed.

Senator REED. I simply want to point out, Madam Chairman, that on the way to Portland, you can stop in Providence, Rhode Island, at T.F. Green International Airport, and whatever you can do, we would appreciate it very much. But again, thank you, Ms. Lenfert, for your help, and Madam, thank you.

Senator COLLINS. Thank you.

Ms. Stubblefield, I don't want you to feel that I neglected you, so I will be certain to submit several questions to the record for you on drones and the integration of them into the airspace, and also the issue of counter drones and why FAA is not enthusiastic about that approach, or so it appears. But we will do that, and I know that Senator Reed will also have some additional questions for the record.

I want to thank each of you for being here today. I want to follow up on a comment that Senator Durbin made earlier about the Government shutdown, and I want to applaud the work of the FAA during the shutdown. That was an extremely difficult period of time, and the FAA really rose to the challenge, and so I want to thank you for that.

The FAA did not cause the shutdown. The shutdown never should have occurred. Shutdowns never produce good results, and they are never worthwhile. And I, for one, appreciate how hard your agency worked to get us through that very difficult period.

I know that it did set back one of the contracts for the NextGen by I believe around 7 months, and that is the unseen consequences. Those are the unseen consequences of Government shutdowns is that it prevents agencies from going forward with needed projects. And the irony is, we end up spending more in many cases than if Government had remained open. So I just wanted to add my comment on that.

I do appreciate each of you being here today and candidly answering our questions. We are going to know more after the investigations are finished. I know that you are committed to finding out exactly what happened with the MAX and making sure that we have procedures and the staff and the resources in place to try to prevent such an accident from ever happening again and claiming not only 346 lives, but also causing tremendous heartache for the families and friends of those who were killed.

ADDITIONAL COMMITTEE QUESTIONS

Senator COLLINS. This hearing record will remain open until next Friday, August 9th, and the hearing is now adjourned.

QUESTIONS SUBMITTED BY SENATOR SUSAN M. COLLINS

AIRPORT IMPROVEMENT GRANTS

Question. As I mentioned in my opening statement, this committee has provided $1.5 billion in supplemental AIP funding over the last 2 years. We directed the FAA to give priority consideration to small and rural airports in making awards, and the FAA has already awarded $1 billion of this funding to critical airport infrastructure projects across the country. In Maine, this funding has been beneficial to several airports, and I am particularly proud of the runway extension project in Rangeley, Maine that will allow increased access to aeromedical services in rural Maine. However, we have a similar project in Jackman, Maine, where the local airport needs additional funding to extend their runway.

Ms. Lenfert, can you tell us the status of the FAA's work with Jackman's runway extension project?

Answer. The town of Jackman is completing the environmental work required for permitting a proposed runway extension. The Environmental Assessment is expected to be completed by early Fall 2019. They are also refining the scope of the runway reconstruction that will use the funds we identified from the fiscal year 2018 Supplemental Appropriations.

Question. My understanding is that there were nearly eight times as many applications as available funding for the supplemental AIP.

Ms. Lenfert, can you tell us what criteria the FAA used to award the limited funding?

Answer. The FAA carefully considered the congressional direction in the 2018 appropriations legislation. This included the requirement to give "Priority Consideration" to certain types of airports (generally smaller and non-primary airports), as well as the 100 percent Federal share for non-primary airports. Congress also gave us more than 2 years to fully obligate the funds. This unprecedented combination of factors meant that many airports could request funding for projects that they would not have normally considered pursuing—and in many cases that included projects for which the airports had not yet completed the necessary planning, environmental review, engineering design, etc. The FAA still had to apply the usual criteria of eligibility, justification, and National Priority Ranking, as well as the airport's ability to implement the project in a timely manner.

Question. As you know, airports like Jackman are eager to receive the remaining funding.

What is the timing of awarding the $500 million from fiscal year 2019 to the airports?

Answer. We anticipate announcing the fiscal year 2019 supplemental discretionary grants by the end of fiscal year 2019. The FAA anticipates being able to start awarding some of the grants late in fiscal year 2019, with the remainder being issued throughout fiscal year 2020 and 2021 (when the selected airports have completed the remaining steps necessary to be able accept the grants).

UAS INTEGRATION

Question. The integration of UAS, or drones, into our national airspace remains a challenge, particularly with the accelerating pace of technology development. What is particularly concerning are the growing use of drones operating near unauthorized locations such as airports. The FAA receives about 100 such reports every month, and has the authority to issue fines and criminal charges for unauthorized drone operators. However, FAA recently sent a letter to the airports saying that the agency does not support the use of counter UAS systems to detect and interdict unauthorized drones.

Ms. Stubblefield, why is the FAA is not supportive of airports developing counter UAS systems at this time?

Answer. We appreciate the level of focus that Congress has brought to this issue, including the provisions of section 383 in the FAA Reauthorization Act of 2018. The FAA understands that many airports have safety and security concerns with regard to the errant or malicious use of UAS on and around airports, and is taking steps to address them. Counter UAS (C–UAS) technologies implicate an assortment of laws, many of which are not within the FAA's jurisdiction. In addition, the FAA is exploring the possible unintended consequences of using detection or C–UAS technologies near airports. The FAA is coordinating with government partners and industry to properly address these concerns.

On May 7, 2019, the FAA sent a letter to more than 500 U.S. airport sponsors explaining the agency's approach to the use of UAS detection and mitigation systems and some of the legal and operational issues involved. We also posted this let-

ter on our website. The FAA continues to work closely with airports that are considering installing UAS detection systems or have already installed such systems on or near their airports. The agency expects to supplement this information with additional information related to UAS detection system coordination as we refine our processes and procedures for safe UAS detection system use at or around airports. The use of certain detection and any C–UAS mitigation systems in the United States is currently restricted by Federal criminal laws without express congressional authorization, which has only been granted to four Federal Departments for specific covered facilities, missions, and assets.

In the May 2019 correspondence, the FAA also provided information regarding some areas of Federal law prohibiting the use of certain detection and any C–UAS (mitigation) technologies at or around airports. These systems could introduce unwarranted safety risks to the Nation's aviation system by interfering with aircraft equipment and air navigation services infrastructure; disrupting targeted as well as legitimate drone operations leading to hazardous flight behavior; and prompting operational responses that may not be adequately risk-based and coordinated. The FAA has been working closely with the Federal Departments—Department of Homeland Security (DHS), Department of Justice, Department of Defense (DoD), and Department of Energy—which Congress granted explicit authority to use C–UAS systems. The requirements for close coordination and collaboration with the FAA in those statutory grants of authority underscore the need to sustain the safety of our National Airspace System through carefully considered and coordinated actions. The FAA does not see a viable way for the risk analysis and mitigation work being carried out by the FAA and the authorized Federal Departments to be replicated across public airports in the foreseeable future without introducing unacceptable safety consequences. It is worth noting that airports have available to them other means of mitigating risks posed by errant and malicious UAS activity. For instance, the combined use of UAS detection capabilities, coordinated response plans for UAS incidents, as well as the development of incident-specific C–UAS plans with our Federal security partners, may prove to be effective strategies to mitigate the risk posed to airports by errant and malicious UAS activity.

Question. It's my understanding that there are already FCC-licensed radar technologies that airports would like to use, but do not have clear guidance from the FAA on whether they are permissible or not.

Can we get your commitment that the FAA will provide clear guidance on the use of these technologies to detect unauthorized drone operations?

Answer. Entities seeking to evaluate or deploy UAS detection systems should be aware of legal considerations around such systems, even systems that are marketed as passive detection systems may implicate provisions of law (such as title 18 of the United States Code) on which the FAA cannot authoritatively opine. Therefore, the FAA cannot confirm the legality of any UAS detection system. An entity considering installation of a UAS detection system may wish to seek system-specific and site-specific guidance from its legal counsel and/or the appropriate authorities in considering Federal, state, and local laws.

The FAA is working with airports, as well as key industry associations, including the American Association of Airport Executives and Airports Council International-North America, to ensure compliance with the FAA's requirements on the installation of equipment, such as a radar system or similar technology, as well as to mitigate safety concerns with the installation of a detection system. It should be noted that radar systems cannot have national spectrum licensing approval, as approvals are site-specific. Licensing through FCC approval and in coordination with FAA's Spectrum Office is required for each site. The FAA is committed to expanding on those established processes to clarify how UAS detection systems may be installed and used at airports without undue, unacceptable safety and efficiency impacts to the Nation's aviation system. The publication of information on the FAA's website on May 7, 2019 is part of the FAA's effort to provide clarifying information. As stated above, the agency expects to supplement this publication with additional information related to UAS detection system coordination as we refine our processes and procedures for safe UAS detection system use at or around airports.

Question. In two specific incidents at Gatwick last year and in Newark this year, pilots reported drones flying near their planes, but the existence of these unauthorized drones were never confirmed.

What guidance is the FAA providing to pilots so they can better identify and avoid drones?

Answer. The agency provides pilots with several resources to better prepare and assist them in identifying and avoiding drone activity in an effort to reduce potential flight hazards and safety risks. These resources include:

—Notices to Airmen that notify pilots of potential hazards along a flight route or at a location that could affect the safety of the flight to include known drone operations;

—Alerts by Air Traffic Control (ATC) that notify pilots of potentially hazardous drone activity;

—Ongoing development of geospatial maps that depict areas where recreational drone operators may be flying; and

—The FAA Aeronautical Information Manual, which is the FAA's official guide to basic flight information and ATC procedures, and includes a section on drones that highlights several factors for pilots to consider in an effort to reduce potential flight hazards.

In addition, the FAA's regulations require drone operators to yield the right of way to all other aircraft, airborne vehicles, and launch and reentry vehicles. Yielding the right of way means the drone operator must give way to the aircraft or vehicle and may not pass over, under, or ahead of it unless well clear. The regulations also prohibit the drone operator from operating so close to another aircraft as to create a collision hazard. The FAA has provided guidance to drone operators on yielding the right of way and on avoiding interference with manned aircraft operations. This guidance is contained in Advisory Circular No. 107–2, *Small Unmanned Aircraft Systems (sUAS)*.

The FAA is also working on a notice of proposed rulemaking for the remote identification of UAS flying in the national airspace. Remote identification will enhance safety, security, and privacy while serving as an important tool in responding to illegal and unauthorized drone operations. The FAA considers this technology essential for the safe integration of UAS into the national airspace system.

UAS TRAFFIC MANAGEMENT

Question. The FAA is currently working to safely integrate drones into the national airspace through the UAS traffic management system, or UTM This approach is similar to how the FAA controls the airspace through air traffic control.

Ms. Stubblefield, can you explain what level of control the FAA will have over drone operations through the UTM?

Answer. The FAA works as both the regulator and Air Navigation Service Provider (ANSP) for the National Airspace System (NAS). The regulatory side of the FAA will maintain safety oversight over all aircraft operations through operational regulations. The Air Traffic Organization (ATO), as the ANSP, will continue to provide select services to ensure safety and efficiency in the NAS. We do not expect to control small unmanned aircraft systems (UAS) at low altitudes as we do for manned aircraft. In airspace where ATO does not actively provide separation services to UAS, UAS Traffic Management (UTM) will allow airspace users to cooperatively manage their operations based on specific principles of operation identified in FAA policy and requirements. These principles will ensure interoperability through industry standards while supporting industry innovation, allowing technology and automation-driven solutions to lead the way. Currently, in controlled airspace, UTM operators, where authorized, cooperatively manage their operations; however, the ATO maintains its authority over the airspace and can intervene as necessary.

Question. Last year, Sec. Chao announced the formation of a UAS Integration Pilot Program, which has now been on-going for over a year.

What has the FAA learned from the IPP that will be useful in the development of the UTM?

Answer. Through the UAS Integration Pilot Program (IPP), we continue to engage in meaningful dialogue with local and national governments and the UAS industry on issues related to drone integration.

IPP participants are gathering data on radio frequency transmission capabilities from handheld radios and cellular networks. This information will be used to inform UTM communication requirements, specifically the capabilities and limitations associated with the transmission of data between unmanned aircraft, operators, and UAS Service Suppliers (USS). This data also enables the development of testing requirements and performance-based standards that will be used broadly across the UAS regulatory community.

On a broader note, through our work with IPP partners we have learned that public engagement will be critical for routine operations, especially those enabled by UTM solutions. We have also observed that there is an overall positive sense toward integrating drones into communities. Societal acceptance will be predicated on the public expectation for safety in these new types of operations, just as in the air-

line industry. Working together, we can accelerate the development of the UTM ecosystem and usher in the necessary social transformation.

Question. Ms. Stubblefield, can you tell us what specific FAA programs in the budget request are critical to further your work on drones and establishment of the UTM?

Answer. Several programs in the fiscal year 2020 President's budget request are critical to further our work on drones and establish UTM. In the Facilities and Equipment account, the budget request includes $68.4 million under the heading "NextGen—Unmanned Aircraft Systems" and another $58.4 million under the heading "Unmanned Aircraft System (UAS) Implementation." In addition, the budget request includes $7.5 million for "Unmanned Aircraft System Research" in the Research, Engineering and Development account.

CYBERSECURITY

Question. In February, Sen. Reed and I asked the GAO to conduct an assessment of cybersecurity risks associated with certification of aircraft avionics. GAO's assessment is currently underway, but I think it is important to know what the FAA is doing today on this issue.

I would like to ask each of the panelists, what efforts is the FAA already undertaking to reduce its cybersecurity vulnerabilities?

Answer. The FAA requires the applicant and/or manufacturer of transport category airplanes to ensure critical systems are protected against unauthorized intentional electronic interaction. As part of the certification process, applicants perform a security risk assessment and show the FAA how they are mitigating the identified risks or reducing the risks to an acceptable level. The FAA must agree that the applicant's assessment and mitigations are adequate. Examples of mitigations are physical control of maintenance, system separation, system error recognition, system redundancy, automatic access logging and pilot intervention against unusual behavior.

The FAA has updated its policy, guidance material, and standards on safeguarding critical airplane systems. We have partnerships in place with the DHS and DoD for sharing information on identified aviation cyber vulnerabilities. We are forming partnerships with industry to implement cyber hygiene and best practices on a voluntary basis. We are also conducting research at the FAA Technical Center to develop a cyber-risk assessment methodology. This methodology will be used as new vulnerabilities arise to inform potential new requirements or mitigation strategies.

Question. This Committee has provided increased funding over the last 2 years for the FAA to develop and implement an integrated Cyber Testbed at the FAA Technical Center.

Mr. Burleson, can you tell us the status of work on the testbed?

Answer. The integrated cyber testbed at the FAA Technical Center has been completed and is fully operational. The Cyber Test Facility, or CyTF, is used to test new cybersecurity products and technologies, perform penetration testing of FAA infrastructure, conduct incident response exercises, and support our cyber research and development efforts. We are currently expanding the facility, adding a new classified lab. The classified lab will allow the FAA to participate in classified exercises directly from the Technical Center, and conduct research and testing of FAA systems that interface with DoD and DHS systems. It will also give staff in New Jersey direct access to classified threat databases. The classified lab should be operational in the spring of 2020.

Question. One of the concerns with cybersecurity that I hear about from virtually every Federal agency is the lack of technical expertise and difficulty in hiring the appropriate experts to work on these issues.

Mr. Burleson, does FAA have the technical expertise to provide cybersecurity oversight of manufacturers as they development new avionics?

Answer. Yes, the FAA has the technical expertise to oversee avionics manufacturers as well as the airplane manufacturers that install avionics in their flight decks. The FAA ensures manufacturers meet all FAA safety requirements as part of the certification process, and the FAA is directly involved with the introduction of new avionics and technologies. In addition, the FAA leverages the industry's technical expertise, when needed.

The FAA continues to make progress in improving information sharing with DHS and DoD. Information on possible cybersecurity vulnerabilities are shared and assessed, and mitigations are developed, when necessary. The FAA is collaborating with the Aerospace Industries Association to establish an industry stakeholder committee that will encourage voluntary adoption of cybersecurity best practices and,

if necessary, mitigations. To properly address cybersecurity threats to aviation, partnering within the U.S. Government and with aviation stakeholders is essential.

QUESTIONS SUBMITTED BY SENATOR RICHARD C. SHELBY

Question. Ms. Lenfert—Recently there has been much debate and press coverage regarding Chinese state sponsored companies building rail cars and busses that serve passengers around the county and, in particular, rail cars in the Washington D.C. area—rail cars that consistently stop in highly sensitive and secure areas such as the Pentagon and Reagan National Airport. These companies have an unfair monetary advantage over others and create concerns regarding our national security interests and intellectual property theft when conducting business with any state subsidized entity.

It is my understanding that some foreign state-owned enterprises have attempted to enter into the U.S. market of passenger boarding bridges, which could have a number of cyber and data privacy concerns. Has your office been made aware of these concerns? If so, please share the efforts that you and your team are putting in place to ensure the safety of our transit systems and airport bridges across the country.

Answer. The FAA is aware that there are concerns regarding a particular foreign-owned boarding bridge manufacturer, which had at one time entered into a joint venture with a U.S.-based manufacturer. That relationship has subsequently ended, but not before a U.S. airport entered into an agreement that appeared to make a commitment to purchase a minimum number of boarding bridges from the non-U.S. entity. That agreement has now sunset with no such purchase being made.

The FAA is required to abide by the "Buy American" requirements in 49 U.S.C. § 50101 in administering Airport Improvement Program (AIP) grants. The FAA also actively uses the Federal Suspension and Debarment system administered by the Office of Management and Budget through 2 CFR part 180. Under this system, businesses that have been suspended and/or debarred cannot receive federally funded contracts for a designated timeframe. For example, if the United States Trade Representative or other Federal Agency finds an entity to be in violation of Federal law, the agency may pursue suspension and debarment. This would prohibit AIP awards to those entities either directly or via contract at any tier.

After careful consideration, the FAA does not believe that boarding bridges represent a cybersecurity vulnerability. Even the most sophisticated boarding bridges are rather limited in terms of actual integration with airport or FAA information technology systems. The boarding bridge itself is little more than a conduit for such data-management systems, without a built-in data management capability or access points. Even if the boarding bridge were to be equipped with doors (near the aircraft-end of the bridge) that are linked to the airport's overall access-control system, this would still involve relatively simple cabling and local equipment.

QUESTIONS SUBMITTED BY SENATOR JOHN BOOZMAN

Question. Taxpayers across the country, including in Arkansas, point to government inefficiency in the delivery of infrastructure investments. Projects that should reasonably be completed in a few years typically last decades, delaying public benefits and exponentially increasing costs.

How, if at all, can public-private-partnerships help accelerate infrastructure delivery and create better value for taxpayers?

Answer. In the FAA's experience, most projects that face significant delays are due to either local community opposition, lack of consensus among the governing body, inability to secure critical real estate, or other similar circumstances.

It is true that some airports face challenging local procurement rules, and highly complex projects can sometimes be impacted by miscommunication or disputes between owners, engineers, and contractors. There are a variety of alternative project-delivery methods that can help, including several forms of public-private partnership (P3) structures.

The fundamental feature of a P3 is that the public agency grants a private entity the right to design, build, operate, maintain and (in many cases) finance major facilities or infrastructure for a specific period of time, while the public agency retains ownership of the asset. Key advantages include increased likelihood of project completion on time and within budget; single point of accountability; and increased like-

lihood of innovation (especially if there is a financial incentive to do so), all while retaining public ownership and control.

The FAA is working closely with the Build America Bureau to educate the airport industry on the value of P3 strategies. We have jointly participated in conferences dedicated to this subject. Moreover, the Airports Cooperative Research Program (which the FAA administers in cooperation with the Transportation Research Board of the National Academies) held a three-day conference on P3 strategies. The FAA has also supported a number of case studies highlighting P3 projects, and is developing a consolidated web presence to address the subject.

Question. The Essential Air Service (EAS) program is vitally important to Arkansas, along with every other rural state in the country, giving small towns access to air service. Not only does the Essential Air Service program provide safe and reliable transportation, but it also boosts the country's economy by providing access to businesses in rural areas. Historically, many presidents have chosen to reduce funding for the Essential Air Service program in their yearly budget requests to Congress.

Can you please explain what a reduction of funding of the Essential Air Service program would mean for rural America?

Answer. The requested fiscal year 2020 program level of $270 million is required to maintain continuous, regularly scheduled air service to about 170 small communities across the nation, including about 60 in Alaska. DOT would use $20 million in carryover funds to maintain continuous operation of the program.

Question. Section 242 of the most recent FAA reauthorization permits the FAA to accept foreign airworthiness directives under certain circumstances if the foreign regulator, like the European Union Aviation Safety Agency (EASA), is transparent and the FAA is confident in their capabilities as a regulator. As we were working on the FAA reauthorization last year, I understood this provision would, when implemented, improve safety and allow for a more efficient use of FAA resources.

Would you agree with that assessment?

Answer. The FAA appreciates the Committee's efforts to assist the FAA in maximizing the efficiency of our continued operational safety process. While section 242 of the FAA Reauthorization Act of 2018 allows the Administrator to accept an airworthiness directive issued by a foreign civil aviation authority, it is not self-executing and will require additional action to implement.

Question. Further, could you provide an update on the work being done to get this process in place given its safety benefits?

Answer. The FAA is working to determine how the authority granted in section 242 can best be used, given other statutory constraints imposed by Congress upon the agency, to contribute to the efficient and timely incorporation of Mandatory Continuing Airworthiness Information from qualified foreign authorities.

Question. As Co-Chair of the Senate General Aviation Caucus, I know many communities across the country rely on small and medium sized airports. In fact, in Arkansas, general aviation contributes 2.4 percent of state GDP and supports more than $597 million annually in economic activity.

One particular issue the general aviation community has been working to address is pricing and ramp transparency. Without it, private pilots have a hard time knowing what they will be charged before they land at an airport.

What is the FAA's position on some sort for standardization of labeling airport ramp areas so general aviation pilots can easily identify these areas when looking to park their planes. Is the FAA currently taking any actions to ensure these ramps are transparent, standardized, and clearly identified on airport diagrams?

Answer. Comparative pricing of airport services (other than fuel sales) has always been difficult because many Fixed Base Operators (FBOs) often discount prices or bundle services. Fuel prices are readily available on the Internet.

After some encouragement by advocacy groups, some FBOs are posting their basic services and pricing. We believe the Government Accountability Office will be addressing this subject later this year when they release their report on FBO practices.

On the subject of transparency and ramp charting, several associations (including the Aircraft Owners and Pilots Association, National Business Aviation Association, General Aviation Manufacturers Association, Experimental Aircraft Association, and the Helicopter Association International) met with the FAA's aeronautical charting staff to discuss the possibility of designating the types of ramps that would be available on an airport. The FAA was concerned that the discussion did not include airport representatives. As a result, the American Association of Airport Executives and the Airports Council International-North America are now engaged in the dialogue. The FAA also wants to ensure that additional information on ramp charts does not lead to confusion that creates potential safety risks.

The FAA has encouraged the industry stakeholders to work together to come up with a solution. The FAA has no objection to the standardization of labelling airport ramp areas, but strongly prefers that industry work together to develop a consensus, voluntary solution. We are concerned about trying to establish and impose mandatory requirements.

QUESTIONS SUBMITTED BY SENATOR STEVE DAINES

Question. I remain a supporter of the Contract Tower Program, as it is a cost-effective way to provide air-traffic control services at small and rural airports. However, the tower in my hometown of Bozeman continues to have staffing issues due to its rapid growth and location in a region that experiences heavy snowfall for more than half the year. Bozeman is currently the largest airport in the state in terms of both passengers and tower operations. Bozeman has seen a 24 percent increase in passenger traffic in just the first 6 months of this year compared to the same time last year. The airport supports the operation of the tower by paying about $200,000 annually to maintain and equip the tower and pay for additional staffing hours to provide 20-hour daily tower service.

It is my understanding that Bozeman has submitted a request for the FAA to pay for the additional staffing hours. Will the FAA commit to reviewing the proposal and taking into account the uniqueness of Bozeman's situation mentioned above?

Answer. Yes, the FAA has reviewed the Bozeman request. We understand Bozeman has experienced a 24 percent increase in passenger traffic in the first 6 months of this year. However, the tower operations count during the same period has increased by 15 percent. The increase in tower operations occurred during the core hours of operation, which are sufficiently staffed to handle the increases.

FAA Order JO 7232.5G provides guidance on increasing or reducing hours of operation for air traffic control towers. The order lays out the criterion for an increase in hours as being "more than 4 operations per hour." Staffing hours for all towers—FAA and Federal contract towers (FCT)—are determined using hourly traffic count and current data. This data shows that additional hours of operation at Bozeman are unnecessary. If traffic at Bozeman at the times of interest were to increase to average 4 operations per hour then it would qualify to be funded for additional time. The current staffing plan provides adequate staffing for its hours of operation and traffic activity.

An increase in traffic alone does not mean there is enough workload to justify an increase in staffing. FCTs provide visual flight rule (VFR) services similar to FAA VFR air traffic control towers. When comparing staffing between FAA facilities and FCT facilities, the same information is used to justify added staff. We analyze the category of traffic count, the airport complexity, airspace complexity, hours of operation, and single controller coverage. Traffic and staffing at Bozeman was evaluated at the beginning of this year. One of the factors considered was the opening of a new Runway 11/29—which has helped de-conflict local pattern traffic from itinerant aircraft using Runway 12/30 and reduced some of the controller workload. Overall, our analysis does not support increasing staffing hours at Bozeman.

Question. FAA Order JO 7232.5G deals with increasing or reducing hours of operation for air traffic control towers. The order lays out the criteria for an increase in hours as being "more than 4 operations per hour". Bozeman is a small hub airport with significant terrain challenges that also lies in a region that experiences heavy, sustained snowfall. There have been numerous instances of conflicts between aircraft and snow removal equipment over the last 20 years. When it comes to the four operations per hour standard, given that clearance and coordination by the tower with snow plows and sweepers is similar to what occurs with aircraft, why hasn't the FAA considered including snow removal activities on the runways, etc. as an "operation"?

Answer. For the purpose of determining staffing FAA uses hourly air traffic operations to make the determination. Ground operations such as snow removal, sweeper operation, airfield lighting checks, runway checks, etc. are not considered special circumstances for determining staffing. Airports have procedures to allow for ground operations and an extensive training program for the operators. Ground operations are normal operations that occur at airports across the nation after tower closures and at uncontrolled airports with no towers.

Question. Additionally, Joint Order 7232.5G specifically mentions in Service Hours that "Occasionally, early opening or late closing of the facility may be necessary to accommodate special circumstances." Do snow removal operations con-

stitute a "special circumstance" that FAA would accommodate for additional hours? If no, what is FAA's reasoning?

Answer. No, snow operations are ground operations, similar to sweeper operations, runway checks, runway and taxiway light checks, etc., which are considered normal operations. Special circumstances arise when non-recurring unscheduled activities or events occur and require staffing to accommodate the special operations, which could include the tower remaining open late (at no cost to the government) for a special event or weather incident. Additionally, Joint Order 7232.5G specifically mentions in Service Hours that "Occasionally, early opening or late closing of the facility may be necessary to accommodate special circumstances." The guidance for "occasionally" is covered in Order JO 7210.3BB, Subject: Facility Operation and Administration. "Early opening or late closing may be occasionally necessary to accommodate traffic which may otherwise divert or cancel its operation because air traffic control is not available at the airport." This guidance is not applicable for permanent operations, which refers to the tower remaining open for the specified hours 365 days, as requested by Bozeman.

Question. Section 327 of the FAA Reauthorization Act of 2018 (PL 115–254) mandated that the FAA develop and implementation plan to provide approach control radar to airports currently served by FAA towers with nonradar approach and departure control. The Helena Regional Airport in Helena, Montana is one such airport for which this section was included. Could you please provide an update on the status of implementing this section, particularly with respect to Helena?

Answer. Section 327 of the FAA Reauthorization Act of 2018 (PL 115–254) mandated that the FAA develop an implementation plan to provide approach control radars to airports currently served by FAA towers with non-radar approach and departure control. The Helena Regional Airport in Helena, Montana is one such airport for which this section was included. We are now looking at the budgetary and flight volume considerations of providing Helena with approach control radar services. A determination will be complete by the end of 2019.

QUESTIONS SUBMITTED BY SENATOR JACK REED

Question. Ms. Lenfert, I want to thank you for the grant that the T.F. Green airport received out of the 2018 competition to address its runway safety needs. While the grant was substantial, it is only half of what is needed to complete the overall project. When awards were made, there was a footnote that the FAA would work to identify resources in order to complete partially funded projects.

Will there be an opportunity in the remaining discretionary awards that have yet to be released this year, or the next general fund competition for fiscal year 2019, or both?

Answer. The FAA reviews AIP discretionary funding requests on a recurring basis. The $30 million grant that the FAA gave to Providence T.F. Green was the single largest grant made under the 2018 Supplemental Appropriation, and fully funded the Runway 16/34 reconstruction project. The sponsor did request funds for taxiway work as well, and the FAA will be able to consider those elements for future Federal funds after the planning and environmental work are completed.

Question. With the budget agreement in 2018, this Subcommittee was able to increase the funding levels for AIP grants by $1.5 billion over 2 years making a total of $8.2 billion available to airports to make critical safety improvements.

As we evaluate infrastructure investments for the 2020 fiscal year, what have airports reported to you on their needs and capacity to spend in a timely manner?

Answer. As required by law, the FAA published the biennial National Plan of Integrated Airport Systems (NPIAS) Report in September 2018, showing $35.1 billion in AIP-eligible projects for 2019–2023. That translates to about $7.02 billion annually. The funding requests the FAA received in response to the 2018 Supplemental Appropriation validated this figure, with more than $8.4 billion in eligible requests. The FAA is confident that the Nation's airports can use any available funds quickly, efficiently, and cost-effectively, if the funds are available early enough each fiscal year to enable the airports to take advantage of the full construction season.

Question. With the expanded authorities of the most recent FAA authorization bill making a broader category of terminal projects eligible for general fund AIP grants, how does that impact program demand for these limited resources?

Answer. The FAA's September 2018 NPIAS report identified $35.1 billion in total unfunded needs for AIP projects. Of the unfunded needs, the report identified $25 billion (73.4 percent) for safety, security, reconstruction, and standards projects and $4.1 billion (11.6 percent) for terminal development. However, the FAA believes this

figure for terminal development may be low. Although the FAA recognizes the importance of terminal projects, their priority is low when compared to safety, security, reconstruction, and standards projects. As a result, some airports may not include all needed terminal work in their capital improvement plans, especially when prioritizing larger safety, capacity, or standards projects.

Many larger airports increasingly rely on Passenger Facility Charges (PFCs) for terminal projects for several reasons: limited amount of AIP funds available for lower priority projects; a greater degree of local control; better predictability in terms of timing; broader flexibility on procurement processes, including alternative project delivery methods as well as public-private partnerships; and the ability to leverage the funds by using them as a dedicated funding source for repayment of bonds.

The FAA will continue to work with airport sponsors to identify terminal development needs. The FAA will also consider and prioritize them where possible among the many competing requests for funding for any supplemental appropriations.

Question. Have you notified your field offices of this new authority so that they are properly communicating with airports that are planning to compete for funding in the next competition?

Answer. The FAA has notified its field offices of the new authority, and those offices are in constant communication with both airports and state aeronautical agencies about airport capital improvement planning. Additionally, the FAA posted information on its public website related to the new authority associated with the most recent supplemental appropriation and future appropriations that may be made available under this provision of the statute.

Question. A great deal of work is required from your office to evaluate and award funding, as well as to oversee the effective use of taxpayer resources.

How has this increased tempo affected your staff resources?

Answer. The additional funding has increased the workload for our staff. We deeply appreciate that the appropriations bills have allowed a small percentage of the funds (half of one percent) to be used for administrative purposes, to garner the additional resources needed to oversee the effective use of public funds. One of the key reasons that our people are so effective in managing AIP grants is that most of the people involved are either airport planners, engineers specializing in airfield pavement or electrical systems, or other categories of technical experts. The additional funding does force these employees to defer other time-critical work within their range of competencies. Therefore, if supplemental appropriations are going to become a long-term reality, then we may at some point need to consider supplementing the staff that administers the program.

COUNTER UNMANNED AIRCRAFT SYSTEM (UAS)

Question. Ms. Stubblefield, based on your work with other Federal agency partners and the recommendations of the Blue Ribbon Task Force on UAS mitigation, what steps are you pursuing to authorize additional users to mitigate UAS threats to airports and commercial aviation?

Answer. The FAA understands the safety and security concerns of many airports relative to the errant or malicious use of UAS on and around airports, and is taking steps to address them. In early May, the FAA provided information to airport sponsors to explain some of the legal and operational issues they may want to consider and our approach to the use of UAS detection and mitigation systems.

There are currently available options for government and private sector entities to use certain UAS detection technologies. In order to support the safe integration of UAS detection systems into the airport environment, the FAA published important information for airport sponsors on May 7, 2019—it is available on the FAA website—and continues to work closely with airports who are considering installing UAS detection systems or have already installed such systems on or near their airports. The agency expects to supplement this information with additional information related to UAS detection system coordination as we refine our processes and procedures for safe UAS detection system use and coordinated operational response at or around airports. Some detection systems also permit the location of the operator, which enables law enforcement to conduct real-time response. Detection is a necessary and, sometimes, sufficient tool to be able to mitigate potential UAS threats.

In that May 7 correspondence, the FAA also provided information regarding the prohibition on the use of Counter-UAS, or C–UAS, (mitigation) technologies at or around airports. These systems could introduce unwarranted safety risks to the Nation's aviation system by: interfering with aircraft equipment and air navigation services infrastructure; disrupting targeted as well as legitimate drone operations

leading to hazardous flight behavior; and prompting operational responses that may not be adequately risk-based and coordinated. Although the FAA does not have authority to deploy C–UAS technology, nor to delegate such authority, the agency has been working closely with the four Federal Departments, to which Congress has granted explicit authority to use C–UAS systems. The requirements for close coordination and collaboration with the FAA in those statutory grants of authority underscore the need to sustain the safety of our National Airspace System through carefully considered and coordinated actions. Further, the FAA sees the combination of the expanding usage of UAS detection capabilities, development of coordinated response plans for UAS incidents, and the movement toward Remote Identification and other UAS Traffic Management (UTM), as well as development of incident-specific counter-UAS plans with our Federal security partners, as an effective strategy to mitigate the risk posed to airports by errant and malicious UAS activity.

Question. What additional authorities, including criminal penalties, should be considered to guard against the use of drones as weapons or instruments of terrorism?

Answer. The FAA does not currently anticipate the need for additional civil authorities as it relates to the use of unmanned aircraft as weapons. We defer to our security partners regarding any additional criminal provisions that should be considered.

EMERGENCY MEDICAL KITS (EMKS) AND OPIOID OVERDOSES

Question. Opioid-related overdoses continue to be a significant public health challenge and hazard. In February, the Association of Flight Attendants wrote to urge the Federal Aviation Administration (FAA) to issue regulations requiring that the Emergency Medical Kits include naloxone nasal spray to treat opioid overdoses.

Sadly, a few weeks ago, a passenger died of an overdose on a domestic flight. The airline in that case announced in March that it would begin the process of adding naloxone to its enhanced Emergency Medical Kits, although it is not required by the FAA. Unfortunately, in this case, it appears that the aircraft was not equipped with a new medical kit.

Mr. Burleson, is the FAA considering requiring the addition of naloxone to emergency medical kits?

Answer. The FAA last revised emergency medical equipment regulations prior to the onset of the opioid crisis. As such, the opioid antagonist (naloxone) did not flag as an item for potential inclusion in the kits. The FAA periodically reviews the kits and most recently requested the Aerospace Medical Association (ASMA) to review the existing content of required kits and make recommendations about revisions. The FAA received recommendations from ASMA and completed its review of them in late August. ASMA has recommended that naloxone be added to the kit. The FAA would agree that any revision should include an opioid antagonist.

Updating the kits would require rulemaking. A new regulation would impose cost on the air carrier operators and their kit suppliers to procure new kits and retrofit their fleets with them. It also would require new familiarization training for crewmembers. For past revisions of the kits, the FAA set a 3-year compliance date as it takes time to refurbish the fleets and retrain crewmembers.

Question. How quickly could such a change be made? And what are airlines doing on their own?

Answer. Some air carriers carry naloxone voluntarily and more may be considering it. Although an opioid antagonist is not specifically required, air carriers certainly are not precluded from carrying it. As mentioned in our response to the previous question, a change to require naloxone in the emergency medical kits would require the FAA to engage in rulemaking to comply with APA requirements. For past revisions of the kits, the FAA set a 3-year compliance date as it takes time to refurbish the fleets and retrain crewmembers.

PFAS/AIRPORT FIREFIGHTING FOAM

Question. Ms. Lenfert, airports and local communities are struggling to eliminate the category of chemicals known as PFAS, which has been shown to have negative impacts on public health and the environment. Because of the widespread use of firefighting foam, we are attempting to address a host of issues related to PFAS in the NDAA bill currently in conference. This includes everything from research and monitoring to clean-ups. In the 2018 FAA Authorization law, Congress also granted the FAA authority to approve alternative types of firefighting foam, but FAA regulations still require airports to use foam containing PFAS.

Can you explain what the FAA is doing to assess and approve alternative firefighting foam that does not pose a risk to public health or the environment?

Answer. The FAA shares your concern on the environmental impact of PFAS. We are aware that the NDAA provision has sparked some concerns from airport associations and individual airports especially regarding environmental cleanup responsibility. The FAA is working diligently on solutions involving aqueous film-forming foam (AFFF) alternatives. For example, the FAA's Technical Center is currently building a dedicated Aircraft Rescue and Firefighting (ARFF) research facility to be completed in the fall of 2019, with the focus on testing AFFF alternatives. One of the goals is to find alternative firefighting agents that are environmentally friendly, while providing the same level of safety currently offered by MIL–PRF–24385 AFFF. FAA researchers have developed a research plan, which outlines the tasks necessary to reach a goal of eliminating PFAS from firefighting foams. This tasks included in the research plan are a literature review, gap analysis, and selection of candidate products to be live-fire tested in the FAA's new facility. We recently finished the gap analysis that examined current research and regulations regarding the use of fluorinated AFFF at airports, fluorine-free foams, and associated chemical compounds. The results are under review.

We are also working closely with the Department of Defense (DoD) and their research into AFFF. We have a research agreement with the United States Air Force research center at Tyndall Air Force Base, where we are able to utilize their chemists to perform chemical composition analysis. An essential part of the research is to ensure that no emerging chemicals of concern are being used to replace current fluoro-chemical formulations.

DoD is also setting up a task force dedicated to this issue and the FAA requested to be included, but it is internal to DoD. DoD has assured us they will keep the FAA apprised of status and progress. We have been invited (and have agreed) to participate on other DoD AFFF Working Groups, both at the action officer and executive level.

While we are researching alternative AFFF products, in the interim, we have made immediate changes to greatly reduce the exposure of PFAS into the environment. In January 2019, we evaluated and approved three input-based foam proportioner testing systems as replacement test methods for discharging foam from ARFF vehicles. Input-based testing does not discharge AFFF into the environment. Furthermore, in June 2019, we issued a program guidance letter explaining AIP funding eligibility determinations and justifications for purchasing these systems.

Question. Do we need to accelerate research and testing for this activity in the FAA's Research and Development account?

Answer. Construction of the ARFF research facility is well underway, and full-scale testing of potential replacement agents will begin after completion of the facility. In the meantime, the FAA has been preparing for future testing by conducting the gap analysis and associated research, as previously described. Both of these efforts were necessary before the start of the live-fire testing portion of the research program. Discussions with foam manufacturers on partnering on the research program have also begun and will continue throughout the program. We do not believe additional resources are needed at this time.

FAA NETWORK MODERNIZATION

Question. The FAA's existing network is a patchwork of customized solutions that is a generation behind modern telecommunications networks.

How will the FAA's evaluation criteria ensure their new network contract will promote continual modernization efforts and will encourage the adoption of commercial networking capabilities over highly customized solutions?

Answer. A fundamental objective of the FAA Enterprise Network Services (FENS) program is to better align the FAA with the direction of the commercial marketplace relative to networking capabilities and technologies. The evaluation criteria defined for the FENS source evaluation emphasize the ability of offerors to meet the FAA's requirements for communication services as they evolve through 2035 as FAA systems modernize their communications interfaces. In addition, the FAA is providing offerors with the flexibility to propose the categories of services that will comprise the FENS Service Catalog so they can leverage their standard commercial offerings rather than forcing them into an FAA-defined construct. Lastly, the FENS evaluation criteria will promote the introduction of new service offerings and technologies throughout the contract period of performance.

QUESTIONS SUBMITTED BY SENATOR DIANNE FEINSTEIN

NOISE DISRUPTION

Question. Many of the communities neighboring airports in my state have been impacted by implementation of Metroplex. What has FAA done to minimize noise disruption for those impacted by changing flight patterns and ensure that collaboration with these communities continues?

Answer. The FAA remains committed to engaging with communities in a meaningful way around airspace changes. Through the Regional Administrator's office, the FAA engages with communities through community roundtables and community workshops. The FAA also stays closely engaged with airports and airlines to educate stakeholders and communities on all of the challenges as the demand on our system continues to grow. The aviation sector is experiencing very strong growth. In the Bay Area, operations at San Francisco International Airport (SFO), Oakland International Airport, and San Jose International Airport (SJC) have increased 27 percent over the last 4 years (2014–2018)—which equates to more than 141,000 additional flight operations.

The FAA Regional Administrator's office along with technical support from air traffic services and the service center regularly attends the SFO Technical Working Group and full Roundtable meeting, the Oakland Noise Forum, and the Santa Clara Santa Cruz Ad Hoc committee meetings, which represents communities adjacent to SJC.

In addition to engaging with communities, the FAA has a research program to both understand and mitigate the impacts of aviation noise on communities. The research program includes the development of the Aviation Environmental Design Tool (AEDT), which can simultaneously calculate noise, emission and fuel burn based on radar tracks and aircraft performance data. AEDT is used not only in the U.S., but also by aviation professionals in 35 other countries, as well as the International Civil Aviation Organization to inform international standard setting. Through the ASCENT Center of Excellence and the Airport Cooperative Research Program, the FAA is also supporting research to understand the impacts of aviation noise on health, sleep, annoyance, and children's learning. Through the Continuous Lower Emissions Energy and Noise (CLEEN) Program, a public private partnership between FAA and industry, we are accelerating the development of technologies to reduce noise and emissions while improving energy efficiency. The research program provides the data that is used to inform the development of policies and standards such as noise stringencies for noise certification. Through ASCENT, it is also supporting the exploration of ways to improve operational procedure concepts to reduce noise exposure from both aircraft and helicopters. The FAA also continues to provide both financial and technical support for collaborative noise compatibility planning through the Part 150 program, which provides a structured process for airports, airlines and other aeronautical users, neighboring communities, and the FAA to work together to reduce incompatible land uses around airports.

SAFETY CERTIFICATION

Question. What actions will you take to remedy the weaknesses in our certification process?

Answer. Continuous improvement is part of the FAA's safety culture. Our commitment to safety demands that we continuously strive to learn from our experiences and use those lessons to strengthen our processes. To this end, the FAA has invited external review and scrutiny of our certification process in general, and the certification of the 737 MAX specifically. These include reviews by the Joint Authorities Technical Review and the Special Committee on Aircraft Certification, among others. The findings and recommendations from these reviews, the accident investigations, and other sources of relevant information will provide important input as we continue to pursue improvements in our processes and policies.

Question. What actions will you take to strengthen whistleblower protections? The Boeing 737 MAX crashes likely would have been avoided had FAA and Boeing employees felt free to frankly express their concerns not only to their superiors but publicly.

Answer. Safety requires the open and transparent exchange of information. We know that it takes communication, and common safety objectives to allow the FAA and the aviation community to identify system hazards and quickly implement safety solutions. This approach gives us knowledge that we would not otherwise have about events and risks in almost real time. Sharing safety issues, trends, and lessons learned is critical to recognizing whatever might be emerging as a risk in the

system. The more data we have, the more we can learn about the system, which in turn allows us to better manage and improve the system.

The FAA takes seriously safety reports and thoroughly investigates all allegations, including disclosures by employees. FAA employees have the right to raise concerns internally and externally if they feel safety is being compromised. There are separate processes to ensure whistleblowers are protected from retaliation and if retaliation occurs, corrective action is taken including disciplining the manager. The FAA maintains a hotline through which FAA employees can and do report safety concerns. The FAA's Office of Audit and Evaluation has a staff of investigators and subject matter experts who investigate and make findings on claims of whistleblower retaliation for making safety disclosures.

Additionally, the Aviation Safety Reporting System (ASRS) provides a protected avenue for anyone to share safety information. NASA maintains the ASRS and ensures that ASRS reports are redacted for any identifiable information of the reporter making a disclosure. The focus is on the disclosure itself and not the identity of the person making the disclosure. More than one million reports have been submitted to ASRS and not once has a reporter's identity been revealed. After the recent 737 MAX crashes, the FAA reviewed ASRS reports that referenced the Maneuvering Characteristics Augmentation System (MCAS) and/or controllability issues with the Boeing 737 MAX. In no case did the reporting party state that the problems experienced were due to the MCAS system.

In addition, the FAA regulations require Organization Designation Authorization (ODA) holders to ensure that no conflicting non-ODA unit duties or other interference affects the performance of authorized delegated functions by ODA unit members. Processes for addressing undue pressure are contained within the FAA-approved procedures manual. FAA inspectors regularly perform oversight on the ODA to ensure they adhere to these processes and that reported employee complaints are properly documented, investigated, and resolved. Additionally, ODA employees use the FAA hotline to report safety concerns, including concerns about undue pressure from companies. ODA employees also have the option to submit safety reports via the ASRS.

Question. Will you ask for increased funding specifically for increasing the number of FAA engineers and other FAA safety and human factors experts and their technical expertise to be able to effectively oversee aircraft design and certification?

Answer. Safety oversight is our top priority. We strive to maintain adequate staffing numbers so we can execute our statutory and regulatory responsibilities. We believe we currently have the necessary number of engineers, safety, and human factors experts to ensure our oversight role is effective. In addition, the FAA leverages the industry's technical expertise, when needed.

It is possible that recommendations from the various reviews and investigations may indicate a need for additional staffing. Upon receiving these recommendations, the FAA will determine if there are any additional resource needs.

FAA AND BOEING RELATIONSHIP

Question. Can you explain how FAA's outsourcing of aircraft certification affected the determination of the dangers that MCAS posed?

Answer. The FAA does not "outsource" certification or allow applicants to "self-certify." Delegation has been a vital part of our safety system since the passage of the Air Commerce Act in the 1920s, which created the foundation for the Civil Aeronautics Administration and eventually the FAA. The FAA utilizes delegation to leverage outside technical expertise, enabling us to focus on areas of highest risk.

The aircraft certification process comprises 4 functions: 1) determination of the applicable design standards (certification basis); 2) planning and standards; 3) analysis and testing; and 4) final decision and certification of design. The FAA determines the certification basis, identifies the standards, makes all key and final decisions, and is directly involved in testing of new and novel features and technologies. The work FAA delegates primarily relate to analysis and testing and involve lower risk and routine items. The FAA does not delegate the other functions.

Following its standard procedures, the FAA determined that the 737 MAX project would qualify as an amended type certificate project. The FAA identified what items would be delegated to the Boeing ODA to approve and which would be retained by the FAA for approval. Boeing first applied for an amended type certificate for this aircraft in January 2012. As a result, of regular meetings between the FAA and Boeing teams, the FAA determined that the project qualified as an amended type certificate project eligible for management by the Boeing ODA. The FAA was directly involved in the System Safety Review of MCAS.

The process from initial application to final certification took 5 years; the FAA added the 737 MAX to the 737 type certificate in March 2017. The process included 297 certification flight tests, some of which encompassed tests of the MCAS functions. FAA engineers and flight test pilots were involved in the MCAS operational evaluation flight test. The certification process was detailed and thorough, but, as is the case with newly certified products, time yields more data to be applied for continued analysis and improvement. As we obtain pertinent data and information, identify potential risk, or learn of a system failure, we analyze it; find ways to mitigate the risk; and, if necessary, require operators to implement the mitigation.

The FAA focused significant resources on certification of the 737 MAX—over 110,000 hours of FAA staff time were devoted to this effort.

Continuous improvement is part of the FAA's safety culture and we are always looking to improve our processes. To this end, Secretary Chao and the FAA have invited external review of our certification process in general, and the certification of the 737 MAX specifically. The findings and recommendations from these reviews, the accident investigations, and other sources of relevant information will provide important input as we continue to pursue improvements in our processes and policies.

Question. How are you ensuring the FAA internal analysis, including the Transport Airplane Risk Assessment Methodology, be taken seriously and more promptly for future actions, including grounding until design or operational changes are undertaken for unacceptably high risks?

Answer. Safety is the agency's first priority. We use a risk based, data-driven process to assess aircraft safety when we receive reports of high-risk service difficulties in the fleet. Tools such as the Transport Airplane Risk Assessment Methodology (TARAM) are an integral part of the process. We use TARAM whenever there is a serious safety issue on transport-category U.S. manufactured aircraft. The results of the TARAM process provide our specialists with key information about how best to manage the risk posed by a specific issue, including guidance on the urgency of the action needed. The FAA acts promptly based on that information and works diligently to provide the aviation community with the information they need to correct the unsafe condition.

Question. What actions will you take to align incentives consistently for the safety of the traveling public and aircrews, and correct for the inherent conflicts of interest in the current process?

Answer. The use of designation, in some form, has been a vital part of our safety system since the 1920s. Congress has continually expanded the designee program since creation of the FAA in 1958, and it is critical to the success and effectiveness of the certification process. Under this program, the FAA may delegate a matter related to aircraft certification to a qualified private person or organization. This is not self-certification; the FAA retains strict oversight authority. The program allows the FAA to leverage its resources and technical expertise while holding the applicant accountable for compliance. During the past few years, Congress has endorsed the FAA's delegation authority, including in the FAA Reauthorization Act of 2018, which directed the FAA to delegate more certification tasks to the designees we oversee.

Organization Designation Authorization (ODA) is a privilege granted to certificate holders who meet stringent eligibility requirements, including technical capability, professional integrity, and a history of compliance. The FAA routinely conducts oversight of ODA holders and may modify or terminate the delegation for a variety of reasons, including improper performance. While the FAA is not involved in how aviation manufacturers compensate their employees, with respect to ODA holders, the FAA can intervene if we see any evidence that the safety of the product may be in jeopardy due to financial pressures.

Question. Will you commit to mandating that those manufacturer employees who do work on behalf of FAA for aircraft certification include FAA during the hiring process and not solely the companies FAA oversees? What steps will you commit to take to ensure that they can have the independence to act in the public interest free from inappropriate pressure?

Answer. An ODA is the means by which FAA grants authority to organizations or companies to conduct various functions on the agency's behalf using FAA approved certification standards. Unit members (or company employees) of an ODA are not FAA employees. However, in their delegated capacity, the ODA members perform certification functions on behalf of the FAA. For newly established ODAs, the FAA evaluates all proposed unit members. Often the individuals selected have prior engagement and experience with the FAA. As the FAA gains experience and confidence with an ODA, the FAA gradually reduces the review of new members.

In addition, during our regular audits we evaluate how the ODA follows their FAA-approved process for selecting and vetting new members.

FAA retains strict oversight authority of ODAs. Our oversight consists of supervising and evaluating the ODA's personnel, procedures, projects, activities, and overall performance.

In their FAA-approved procedures manual, we require ODA holders to have processes that mitigate undue pressure. FAA inspectors perform oversight on the ODA to ensure they adhere to the process and that reported employee complaints are properly documented, investigated, and resolved. Additionally, ODA employees can and do use the FAA Hotline to report safety concerns, including undue pressure from companies.

FUEL EFFICIENCY

Question. What has FAA done to ensure airlines are using more fuel efficient designs and newer, lower carbon fuels?

Answer. The FAA is ensuring airlines use more fuel-efficient designs by regulatory action and by working with industry to advance the development of more efficient technologies and sustainable aviation fuels.

From a regulatory perspective, the FAA developed, with other nations, through the International Civil Aviation Organization's (ICAO) Committee on Aviation Environmental Protection, an airplane fuel efficiency standard for civil subsonic jet and propeller-driven airplanes (a.k.a. CO2 standard). This international standard, if adopted, would establish a minimum fuel efficiency that all commercial airplanes will have to meet. Aircraft types that are currently in production would need to meet a minimum fuel efficiency standard by January 1, 2028. New aircraft types (i.e., those that are certified for airworthiness after January 1, 2020) would have to meet a more stringent fuel efficiency requirement. The FAA anticipates promulgating the international standard into U.S. regulations in the near future.

The FAA is also working with industry through the public-private partnership of the Continuously Lower Energy, Emissions, and Noise (CLEEN) Program (http://faa.gov/go/cleen), to accelerate the development of technologies that improve fuel efficiency while lowering noise and emissions. The technologies being pursued under the CLEEN Program often both provide fuel efficiency improvements while also yielding benefits to noise and/or emissions. Once entered into service, the CLEEN technologies will realize their fuel efficiency and environmental benefits throughout the fleet for years to come.

The FAA is supporting airlines in their pursuit of sustainable aviation fuels by funding testing to ensure the fuels are safe for use; funding research to quantify the environmental benefits of the fuels to support their inclusion within the ICAO Carbon Offsetting and Reduction Scheme for International Aviation; and supporting public-private coordination between the aviation and energy industries and government agencies. These efforts are conducted through our Center of Excellence (www.ascent.aero) and via FAA co-sponsorship, alongside the aviation industry, with the Commercial Aviation Alternative Fuels Initiative, or CAAFI (www.caafi.org).

QUESTIONS SUBMITTED BY SENATOR RICHARD DURBIN

Question. The five year FAA reauthorization bill passed by Congress last year required the FAA to issue a new regulation by this fall mandating secondary cockpit barriers on all newly manufactured aircraft. Installing secondary cockpit barriers was a key recommendation of the 9/11 Commission. Stakeholders, including the airline pilots and flight attendants union, had been pushing for Congress and the FAA to require those barriers since the Commission's recommendation, and they were finally successful in getting the provision included in last year's FAA reauthorization. Now, the FAA is signaling that it will delay issuing the new regulation. Instead, they have said that the issue requires further study and have created an advisory committee to look into the issue despite already studying the issue in 2011. The unions are now concerned that the FAA may recommend applying the barriers to only new types of aircraft or creating an alternative means of compliance, which could delay the mandate by decades. I want to be clear: the FAA must comply with Congress' clear intent to have these barriers installed on all new passenger aircraft by October of this year.

Will the order for secondary barriers be issued by the FAA this October?

Answer. The applicability of section 336 of the Act is not limited to new designs, but applies to each new manufactured aircraft operating under 14 CFR part 121, ranging from regional to very large transport aircraft.

The FAA has tasked the Aviation Rulemaking Advisory Committee to provide recommendations for the implementation of this provision. The advisory committee's advice will help the FAA develop a rule that provides the technical information that manufacturers can follow to meet the legislation, as well as other information on costs and benefits required by the rulemaking process. While the October 2019 timeframe will not be met, the FAA believes the recommendations made by the advisory committee will allow for the most effective approach to implementation.

Question. Over 3,000 aviation safety professionals were furloughs during the harmful 35-day government shutdown caused by President Trump earlier this year. Another 15,000 controllers and aviation safety professionals worked without pay. It's been 6 months since the government reopened, and we're still feeling the impacts of the shutdown on our air traffic control system. The air traffic controllers' union reports that the shutdown led to early retirements and delayed classes at the Federal Aviation Administration (FAA) Academy, causing some students to drop out. For an organization already experiencing a worker shortage and for controllers who have been forced to work longer hours for too long, the shutdown caused serious damage; and, the FAA has reportedly had to lower its hiring target from 1400 this year down to 900. The shutdown also negatively affected the implementation of new safety systems including the Arrival Prediction Alerting System (ATAP), a safety system that can alert a pilot if they are about to land on the wrong runway and need to circle the airport. Six months after the shutdown, can you give us an update on the size and scale of the impacts to air traffic control? How much ground did we lose when it comes to controller hiring and safety upgrades?

Answer. The shutdown itself was not a significant driver for FAA to change staffing plans, as most FAA program offices review and adjust staffing plans on an annual basis, including our two largest mission critical programs, air traffic and aviation safety. Both of these programs made changes to their staffing plans that were based on specific workforce planning factors, such as analysis of current and future state requirements, alignment of mission and staffing, and identifying workforce gaps in staffing, hiring, training and development, and retention. The unprecedented length of the last shutdown did create a need for FAA to immediately reexamine the agency furlough plans to ensure we took steps to adjust our shutdown plans based on lessons learned.

On an annual basis, the FAA conducts a comprehensive review of all agency functions, positions, and staff in place to support those functions. The review also aligns functions by their funding and budget categories. The purpose of this review is to identify which functions and supporting positions are designated as essential for protection of life and safety. The FAA uses this information during a funding lapse to place employees in a furlough status or non-furlough status. The FAA notifies employees who are funded by a lapsed budget category and work in positions designated as essential (or excepted), of the requirement to report to work during the funding lapse, in accordance with the Antideficiency Act and position designations. This practice allows the FAA to continue critical operations with adequate staff during the funding lapse. In addition, the FAA has a process to recall employees from furlough during an extended lapse and when critical safety operations require additional resources to maintain operations.

In the Air Traffic Organization, the lapse in appropriations disrupted the hiring and training of new air traffic controllers.

—Hiring and training enough air traffic controllers is a challenge the FAA faces each year. Controlling air traffic is a difficult, stressful job, and the agency needs to find candidates who can do the job consistently day after day.

—The FAA also needs to get our new hires trained and ready to fill vacancies at our facilities across the country.

—The lapse in appropriations added another hurdle to this process. Our recruitment efforts and training of air traffic controllers were put on hold during the shutdown as only safety essential operations were authorized.

—Despite these challenges, the agency will continue to maintain a controller workforce that can safely manage the national airspace.

Question. I support my colleague Senator Moran's Aviation Funding Stability Act, which would provide pay for air traffic controllers and funding for FAA programs during a government shutdown by authorizing the FAA to draw from the Airport & Airway Trust Fund. Does the FAA leadership support this bill to protect air traffic controllers and their families in the event of another shutdown?

Answer. The Administration has not taken a position on the various pending proposals that would authorize the FAA to draw from the Airport and Airway Trust Fund during a government shutdown. We look forward to working with Congress

as it considers an appropriate mechanism to protect the traveling public from disruptions that can occur from a lapse in appropriations.

Question. While I recognize the hard work that the FAA is doing to resolve the safety challenges with Boeing's 737–MAX, it has now been over 4 months since the FAA moved to ground the aircraft. The safety of the flying public is and must always be the number one priority of the FAA. We cannot allow these planes back in the air unless this safety flaw is fixed and the FAA can verify the safety of the aircraft and the changes that Boeing is making to it; however, neither Congress nor the airline industry has been given any real timeline for when the FAA expects to have the MAX fixed, certified, and back in the air. Meanwhile, the sustained grounding is impacting the flying public. Chicago's hometown airline, United, is currently being forced to cancel 40–45 flights per day because of the Boeing grounding. Those cancellations are expected to increase the longer that the MAX is grounded. If still grounded in October, United estimates that it will need to cancel 95 flights per day. That translates to less choices and higher prices for consumers. Can the FAA provide the public with an estimate on when they expect to certify the Boeing MAX safe to fly again?

Answer. Safety is the core of the FAA's mission and our top priority. With the support of this Committee, the FAA has worked tirelessly to take a proactive, data-driven approach to oversight that prioritizes safety above all else. The FAA recognizes the impact that the grounding of these aircraft has had on airlines and the flying public. However, the FAA will return the 737 MAX to service for U.S. carriers and in U.S. airspace only when the FAA's analysis of the facts and technical data indicates it is safe to do so.

Question. Since the grounding, the FAA in coordination with DOT Inspector General, a special committee of experts convened by Secretary Chao, and the FAA's Technical Advisory Board have been working to both investigate what went wrong with the FAA's certification of the MAX and to determine what changes to their certification process are needed. When is Boeing expected to submit its changes to the FAA and what steps will the FAA take to verify that those changes will solve the problem?

Answer. Boeing has been working to develop the necessary design changes and the FAA certification team has been monitoring and evaluating their progress. There is no firm date for Boeing to submit the final design changes.

FAA is retaining all approvals on the proposed 737 MAX design changes—no aspects will be delegated. As part of an unprecedented level of review by foreign authorities, all changes will be validated by the other members of the Certification Management Team—the European Union Aviation Safety Agency, Transport Canada Civil Aviation, and the National Civil Aviation Agency of Brazil.

In addition, the FAA initiated the multi-agency Technical Advisory Board (TAB) review of the MCAS software update and system safety assessment in order to determine sufficiency. The TAB consists of a team of experts from the U.S. Air Force, NASA, Volpe National Transportation Systems Center, and the FAA. The TAB experts have not been involved in any aspect of the Boeing 737 MAX certification. The TAB has worked to evaluate Boeing and FAA efforts related to the software update and its integration into the flight control system, and its recommendations will inform FAA's return to service decision.

Question. Why wasn't appropriate attention given to the MAX's certification by FAA management the first time around, and what is the FAA planning on doing differently in certifying the MAX's safety this time?

Answer. The certification of the 737 MAX took 5 years, and the FAA focused significant resources—over 110,000 hours of FAA time—on this certification effort.

Going forward, the FAA will retain all approvals on proposed design changes to the 737 MAX. FAA management will again be involved in the approval process and will make the final decision as to whether or not the 737 MAX is safe to operate and can be safely returned to service. In addition, the FAA has initiated a Technical Advisory Board (TAB) to evaluate Boeing and FAA efforts related to the software update and its integration into the flight control system. The TAB recommendations will inform the FAA's return to service decision.

SUBCOMMITTEE RECESS

Senator COLLINS. [Whereupon, at 11:37 a.m., Wednesday, July 31, the hearing was adjourned, and the subcommittee was recessed, to reconvene subject to the call of the Chair.]

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