



U.S. DEPARTMENT OF TRANSPORTATION

OFFICE OF INSPECTOR GENERAL

**Perspectives on Overseeing the Safety of
the U.S. Air Transportation System**

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Before the Committee on Commerce, Science, and Transportation
Subcommittee on Aviation and Space
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Chairman Cruz, Ranking Member Sinema, and Members of the Subcommittee:

Thank you for inviting me to testify on the state of aviation safety and the Federal Aviation Administration's (FAA) oversight of commercial aviation. FAA is charged with safely overseeing the busiest and most complex air transportation system in the world, which carries over 2.5 million people on approximately 45,000 flights every day. However, recent events have brought new attention to FAA's safety oversight and its regulatory role. Most notable are the two fatal accidents involving Boeing 737 MAX 8 aircraft that occurred in October 2018 and earlier this month. The Office of Inspector General expresses our deepest condolences to the families of the victims of these accidents. A number of other incidents have also raised safety concerns. These include the April 2018 Southwest Airlines engine failure—which resulted in the first fatality at a U.S. commercial passenger air carrier¹ in over 9 years—and several safety incidents at airports, such as the near miss of an Air Canada Flight in San Francisco in July 2017.

As Secretary of Transportation Elaine L. Chao has stated, safety is and must remain the Department's top priority. Last week, Secretary Chao requested that our office audit the activities that resulted in the certification of the Boeing 737 MAX 8 aircraft. In addition, we have received requests from Congress to examine other related issues, including FAA's decision-making process that led to grounding the MAX 8 aircraft in the United States. My office has already begun this work and will keep you apprised of our results.

As the Nation's regulator of aviation safety, FAA is responsible for effectively overseeing a vast range of safety-critical areas. To its credit, FAA has taken steps in recent years to help its safety efforts keep pace with a rapidly evolving and diverse aviation industry. Yet, as my office's work has shown, both new and longstanding safety issues present significant challenges to FAA's oversight of the National Airspace System (NAS).

My testimony today will focus on FAA's efforts related to (1) reducing hazards associated with flight deck automation, (2) implementing FAA and industry's evolving safety oversight systems, and (3) addressing other safety-critical watch items.

Summary

Notwithstanding the Nation's safety record, important safety issues—both new and longstanding—need FAA's attention. First, with pilots relying on automated flight systems as much as 90 percent of the time, it is critical that FAA ensure that

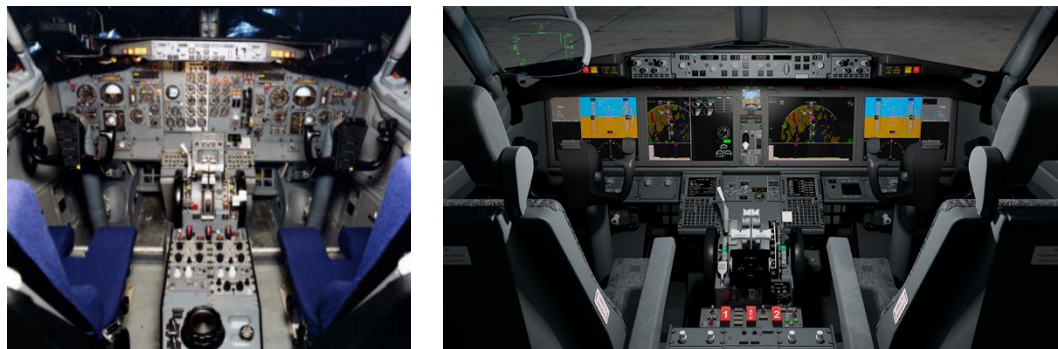
¹ This was the first passenger fatality at a part 121 air carrier since February 12, 2009 (14 CFR Part 121, Operating Requirements: Domestic, Flag, and Supplemental Operations).

air carriers meet its requirements for these systems, including training pilots on how to respond to abnormal flight conditions when automation or other systems fail. Second, FAA faces new challenges as its systems and strategies for safety oversight evolve and air carriers take on a larger role in identifying and mitigating safety risks. To maintain the highest level of safety, FAA must implement effective risk-based oversight of organizations that perform certification work on the Agency's behalf, effectively leverage collaboration and enforcement, and maintain a strong safety culture. At the same time, our recent and ongoing work has also identified other watch areas that are essential to enhancing oversight of the NAS. These include reducing safety risks on the ground and in the air at airports, integrating Unmanned Aircraft Systems (UAS) in the same airspace as manned aircraft, protecting safety-critical information technology systems, and eliminating suspected unapproved parts from the aviation supply chain.

Strengthening FAA Oversight To Reduce Hazards Associated With Flight Deck Automation

Advances in aircraft automation have significantly contributed to safety and changed the way airline pilots perform their duties. Rather than manually flying an aircraft, pilots now monitor flight deck systems. Generally, new automation technologies are added to gain operational or efficiency advantages, such as reducing pilot workload, adding more capability, increasing fuel economy, and allowing access to airports surrounded by challenging terrain. FAA has estimated that automation is used 90 percent of the time in flight.² Figure 1 below shows the advances in flight deck technology between the Boeing 737-200 (pictured left) and 737 MAX 8 aircraft (pictured right).

Figure 1. Evolution of Boeing 737 Flight Decks



Source: Copyright © Boeing

² Estimates according to FAA senior officials, as noted in our 2016 report (see footnote 2).

While airlines have long used automation safely, our 2016 report³ noted accidents in which pilots who typically fly with automation made errors when confronted with an unexpected event or transitioning to manual flying.⁴ As a result, reliance on automation is a growing concern among industry experts, who have questioned whether pilots receive enough training and experience to maintain manual flying proficiency. In addition, preliminary reports on the recent Boeing 737 MAX 8 accidents have suggested a possible link to one of the aircraft’s automation systems, raising concerns about pilots’ abilities to recognize and react to unexpected events.

As shown in table 1, pilots’ use of automation may range from none to high. While no single level of automation is appropriate for all flight environments, pilots must understand automated systems and make appropriate decisions when encountering unusual situations, such as when automation fails or an emergency arises.

Table 1. Levels of Flight Deck Automation

Level	Auto-pilot ^a Engaged	Auto-throttle ^b Engaged	Overview
Full Auto-flight	X	X	The aircraft’s control is fully automated based on information preprogrammed by the pilots.
Tactical Auto-flight	X	X	The aircraft’s autopilot is engaged, but pilots can direct changes to heading, speed, and altitude using a control panel.
Manual		X	The pilot is manually controlling the aircraft based on guidance assistance from the preprogrammed flight directors. This is primarily used for takeoff, initial departure, and landings.
All Automation Off/Full Manual			The pilot is manually controlling the aircraft without the assistance of flight directors. This would be used to avoid collisions with other aircraft or to recover from an undesired aircraft state such as a stall.

^a Auto-pilot helps automate the process of guiding and controlling an aircraft.

^b Modern auto-throttles can control power from takeoff to touchdown.

Source: OIG analysis of air carrier and manufacturer data

³ *Enhanced FAA Oversight Could Reduce Hazards Associated With Increased Use of Flight Deck Automation* (OIG Report No. AV2016013), January 7, 2016. Requested by the Ranking Members of the House Committee on Transportation and Infrastructure and its Subcommittee on Aviation. OIG reports as well as the current status of our recommendations are available at <http://www.oig.dot.gov/>.

⁴ For example, in July 2013, Asiana Airlines Flight 214 crashed short of a runway at San Francisco International Airport. The National Transportation Safety Board determined that the crew did not appropriately understand the aircraft’s automation systems, allowed airspeed to decay due to improper monitoring, and failed to perform a proper go-around response.

To promote safety and provide a basis for oversight while maintaining flexibility for different aircraft and systems, FAA has established certain requirements governing the use of flight deck automation during commercial operations. In particular, FAA developed limitations regarding minimum altitudes at which autopilot can be engaged and how automated systems within the cockpit are configured. For example, during takeoff and climb below 500 feet, FAA restricts the use of autopilot unless the carrier is granted explicit FAA authorization to use it sooner. Further, air carriers must obtain FAA authorization in order to use certain advanced flight procedures⁵ that rely on automation.

In addition, FAA requires that pilots be trained, tested, and proficient in all aircraft they operate, including any onboard automated flight deck systems. The Agency also now requires all part 121⁶ pilots to be trained in specific abnormal flight conditions, which include stall and upset recovery and loss of reliable airspeed (see table 2 for an overview of FAA’s new requirements). These FAA requirements were based on accident investigations and National Transportation Safety Board (NTSB) recommendations. Air carriers had to comply with this rule by March 12, 2019.

Table 2. New Manual Flying Training Requirements for 2019

Training Maneuvers	Overview
Upset Prevention and Recovery	Aircraft upset is an unsafe condition that may result in loss of control (LOC). Training focuses on the pilot’s manual handling skills to prevent upset, as well as training to recover from this condition.
Manually Controlled Arrival and Departure	Pilots will be both trained and evaluated on their ability to manually fly a departure sequence and arrival into an airport.
Slow Flight	Pilots will be trained to understand the performance of the aircraft and the way it handles at airspeeds just above the stall warning.
Loss of Reliable Airspeed	Training will focus on the recognition and appropriate response to an automation system malfunction that results in a loss of reliable airspeed, which increases risk of aircraft stall and/or upset.
Recovery From Stall/Stickpusher Activation	Training will provide pilots the knowledge and skills to avoid undesired aircraft conditions that increase the risk of encountering a stall or, if not avoided, to respond correctly and promptly.
Recovery From Bounced Landing	A poorly executed approach and touchdown can generate a shallow bounce (skip) or a high, hard bounce that can quickly develop into a hard landing accident.

Source: OIG analysis of FAA requirements

⁵ These include Area Navigation (known as RNAV), a method of flying in which aircraft use satellite signals to fly any desired flight path, as well as Required Navigation Performance (RNP) procedures, which add monitoring and alerting capabilities for pilots that allow aircraft to fly more precise flight paths.

⁶ 14 CFR Part 121, Operating Requirements: Domestic, Flag, and Supplemental Operations.

FAA requires these training maneuvers to be performed in flight simulators. However, the recent Boeing 737 MAX 8 accidents have raised questions about the availability and capabilities of these training simulators. For example, FAA determined training for the new Boeing MAX series could be completed in existing simulators. However, according to FAA, existing simulators do not fully replicate the 737 MAX aircraft, and no U.S. airline currently has a MAX simulator.

Overall, FAA has taken steps to emphasize the importance of pilots' manual flying and monitoring skills, as we recommended in 2016. Continued vigilance in these areas can help ensure that air carriers create and maintain a culture that emphasizes pilots' authority and manual flying skills.

Remaining Vigilant as FAA and Industry Safety Oversight Systems Evolve

In recent years, FAA has worked to revamp its strategy for overseeing the safety of the aviation industry. In particular, FAA has increasingly shifted to working with industry to meet shared safety goals, including delegating responsibilities for aircraft certification and requiring air carriers to proactively identify and mitigate their safety risks. Enhancing risk-based oversight, effectively leveraging industry collaboration and enforcement, and fostering a strong safety culture will remain key challenges for FAA as it works to implement its new oversight strategies and ensure the safety of the traveling public.

Enhancing FAA's Oversight of the Aircraft Certification Process

The U.S. civil aviation industry is vital to the Nation's economy and encompasses more than 230,000 aircraft, 1,600 approved manufacturers, and 5,200 aircraft operators, among others. Recognizing that it is not possible for FAA employees to oversee every facet of such a large industry, public law⁷ allows the Agency to delegate certain functions, such as approving new aircraft designs and certifying aircraft components, to private individuals or organizations. In 2009, FAA fully implemented the Organization Designation Authorization (ODA) program to standardize its oversight of organizations (e.g., manufacturers) that are approved to perform certain functions on its behalf.

While delegation is an essential part of meeting FAA's certification goals, robust oversight is essential to ensure that ODA companies maintain high standards and

⁷ 49 U.S.C. § 44702(d).

comply with FAA safety regulations. However, our work over the years on the ODA program has identified management weaknesses with a number of FAA's oversight processes. To its credit, the Agency has taken action to improve its oversight in response to our recommendations. For example, our 2011 report⁸ identified inconsistencies in how FAA aircraft certification offices interpreted FAA's role and tracked ODA personnel. In particular, not all FAA offices consulted FAA's database to pre-screen performance histories of prospective ODA personnel. In addition, under ODA, FAA engineers have expanded enforcement responsibilities, but the Agency had not ensured that they were adequately trained to perform these duties. In response to our findings, FAA clarified guidance on tracking ODA employee performance history and improved its training and guidance for enforcement. As a result, FAA engineers responsible for overseeing ODA employees were better positioned to detect instances of regulatory noncompliance and take enforcement actions.

In 2015,⁹ we reported that FAA's oversight of ODA program controls was not systems- and risk-based,¹⁰ as recommended by an aviation rulemaking committee.¹¹ For example, FAA had not provided oversight teams with tools or guidance on data they should use to identify the highest-risk areas. Another gap in FAA's oversight pertained to companies that produce and supply components to other manufacturers. FAA performed oversight of only 4 percent of personnel conducting certification work on the Agency's behalf at suppliers in the period we reviewed.

In responding to our 2015 report, FAA recognized the need to improve its oversight of organizations performing certifications or other functions on its behalf. By July 2019, FAA plans to introduce a new process that represents a significant change in its oversight approach. For example, FAA's new process will include identifying system elements (such as training and company self-audit processes) and developing new evaluation criteria. While revamping FAA's oversight process will be an important step, continued management attention will be key to ensure the Agency identifies and monitors the highest-risk areas of aircraft certification.

⁸ *FAA Needs To Strengthen Its Risk Assessment and Oversight Approach for Organization Designation Authorization and Risk-Based Resource Targeting Programs* (OIG Report No. AV2011136), June 29, 2011. Requested by Representative Daniel Lipinski.

⁹ *FAA Lacks an Effective Staffing Model and Risk-Based Oversight Process for Organization Designation Authorization* (OIG Report No. AV2016001), October 15, 2015. Requested by Representative Peter DeFazio.

¹⁰ Systems-based oversight shifts from focusing on individual project engineering work to holistically assessing whether ODA companies have the people, processes, procedures, and facilities in place to produce safe products. This allows FAA to focus its oversight on the highest-risk areas, such as new, innovative aircraft designs.

¹¹ The Aircraft Certification Process Review and Reform (ACPRR) Aviation Rulemaking Committee, a joint FAA and industry group, was formed in response to a congressional mandate to study the aircraft certification process.

Overseeing Air Carriers' New Systems for Managing Safety Risks

FAA's safety oversight strategy depends, in part, on air carriers' ability to identify hazards and implement corrective actions that mitigate risk. For example, in 2015, FAA established requirements¹² for U.S. part 121 air carriers to implement a formal, top-down approach to managing safety risks, known as a safety management system (SMS). Specifically, under SMS, air carriers must identify root causes for hazards and proactively manage risk to prevent accidents.

While air carriers were required to implement SMS by March 2018, recent events—including the April 2018 Southwest Airlines fatal engine failure—have raised concerns that FAA's oversight may not ensure air carriers sufficiently meet their risk-mitigation responsibilities. NTSB is currently investigating the accident, but its preliminary reports indicate similarities with a 2016 engine incident on a Southwest Airlines aircraft. We are currently assessing¹³ FAA's oversight of Southwest Airlines' systems for managing risk, including a focus on aircraft weight and balance issues that can affect critical phases of flight, as well as other matters. We expect to report on our findings later this year. Ultimately, while air carriers' SMS are an important part of maintaining the safety of the NAS, FAA must exercise appropriate regulatory oversight and intervene in a timely manner to ensure air carriers take sufficient actions to identify and reduce safety risks.

Effectively Leveraging Collaboration and Enforcement in FAA's New Air Carrier Safety Oversight Program

As FAA continues to move towards allowing air carriers to play a more collaborative role in safety oversight, strong management attention is critical to ensure the Agency's evolving strategy advances its safety goals. In particular, in 2015, FAA implemented a new "Compliance Philosophy" as part of its safety oversight strategy. The Compliance Program, as it is now known, is based on the premise that the greatest safety risk in the industry does not arise from a specific event or its outcome, but rather from an operator who is unwilling or unable to comply with rules and best practices for safety. The overarching goals of the new program are to achieve rapid compliance, eliminate a safety risk or deviation, and ensure positive and permanent changes.

¹² 14 CFR Part 5, Safety Management Systems. This requires part 121 carriers to implement SMS.

¹³ *Audit Initiated of FAA's Safety Oversight of Southwest Airlines*, June 20, 2018. Self-initiated.

FAA's Compliance Program emphasizes the Agency's preference for collaborating with air carriers through education and training instead of penalizing carriers as a means to address discrepancies. This program calls for FAA to work with air carriers to address the root causes of violations of safety regulations rather than to impose enforcement actions—a significant change in the way FAA and the airlines previously addressed compliance and safety issues. A key issue we will assess in upcoming audits is whether the Compliance Program is suitable for all air carriers, regardless of current working relationships or unique business models and operating environments.

An important component of the Compliance Program is working with carriers to identify the root cause of a violation. However, our ongoing audit¹⁴ related to Allegiant Airlines has highlighted the complex challenges FAA faces in implementing its new oversight approach and addressing the root cause of the air carrier's maintenance violations. Specifically, a longstanding maintenance issue at Allegiant Airlines resulted in a series of mid-air engine shutdowns, aborted takeoffs, and unscheduled landings. Our ongoing work focuses on the degree to which FAA's inspectors documented adjustments to their surveillance, effectively examined the root cause, or convinced the airline through collaboration to perform additional tests to operate at a higher level of safety. Overall, while FAA's Compliance Program offers a new strategy for addressing risk, such as potentially insufficient maintenance, the Agency's oversight must remain robust to ensure airlines implement effective corrective actions. A key challenge FAA faces moving forward is effectively leveraging both collaboration and enforcement and accurately assessing whether an air carrier is willing and able to correct its deficiencies.

Maintaining a Strong Safety Culture To Adequately Support FAA's Changing Oversight Methods

The success of FAA's evolving oversight methods depends on a strong safety culture within both the Agency and industry. According to FAA, a positive safety culture is one that is actively promoted by all levels of management and demonstrates a commitment to safety over competing goals and demands. Within such a culture, people acknowledge their accountability and act on their individual responsibility for safety.¹⁵

¹⁴ *Revised Notification – Review of FAA's Oversight of Air Carrier Maintenance Programs*, May 9, 2018. Requested by Representatives Peter DeFazio, Rick Larsen, Nita Lowey, David Price, Mike Quigley, Katherine Clark, Pete Aguilar, Jacky Rosen, and Cheri Bustos and Senator Bill Nelson.

¹⁵ FAA Order 8000.369B, *Safety Management System*, March 18, 2016.

However, as early as 2015, FAA's Office of Audit and Evaluation cautioned about changes in airline safety culture and the potential impacts on safety and airline maintenance workforces. FAA guidance recognizes the impact that a single inspector can have on safety culture and establishes standards that require inspectors to act impartially and avoid the appearance of preferential treatment when they perform their official duties. Nonetheless, our recent work¹⁶ identified concerns regarding an FAA inspector's oversight of American Airlines' flight test program, which is used to verify the airworthiness of aircraft following major repairs. We found that an inspector had developed a personal relationship with the head of the carrier's flight test program and appeared to give the carrier preferential treatment when safety concerns were raised. The inspector also worked with the carrier to suppress future complaints. Ensuring that FAA's inspector workforce meets standards of impartiality remains a key oversight challenge for the Agency to strengthen its safety culture and effectively identify and mitigate risks.

Addressing Other New and Longstanding Safety Challenges

While working to address the urgent safety concerns highlighted by the recent Boeing 737 MAX 8 accidents, FAA must remain vigilant about other emerging and longstanding areas that are critical to maintaining the safety of the NAS. These include improving safety on the ground and in the air at airports, integrating UAS in the same airspace as manned aircraft, protecting flight-critical systems that directly affect the safety of aviation passengers from cyberattacks, and identifying and removing suspected unapproved parts from the aviation supply chain.

Reducing Runway Safety Risks at Airports

Incidents in which collisions between passenger aircraft were narrowly avoided at our Nation's major airports have renewed attention to runway safety. For example, in July 2017, a commercial pilot at the San Francisco International Airport attempted to land on a taxiway where four other aircraft were awaiting takeoff.¹⁷ Much of our work in this area has focused on FAA's efforts to reduce

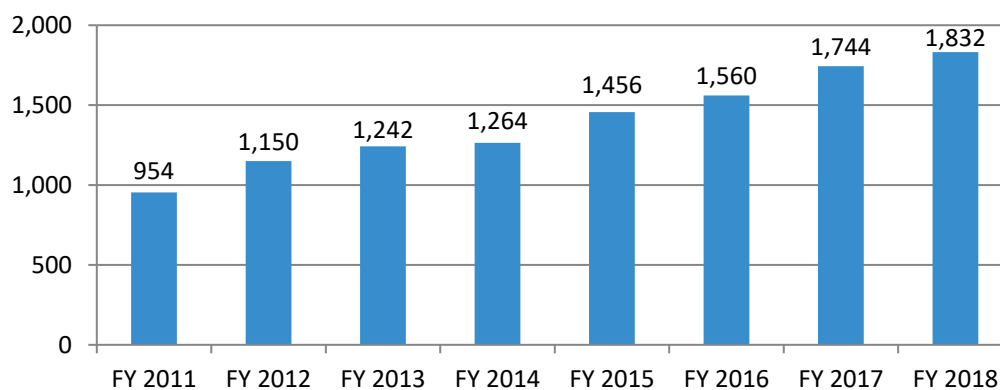
¹⁶ *FAA Has Not Fully Addressed Safety Concerns Regarding the American Airlines Flight Test Program* (OIG Report No. AV2018060), July 10, 2018. Self-initiated.

¹⁷ NTSB News Release, *Flight Crew Misidentifies Runway, Causes Taxiway Overflight*, September 25, 2018. NTSB determined an Air Canada flight crew's lack of awareness caused the overflight of the taxiway.

runway incursions—incidents involving unauthorized aircraft, vehicles, or people on a runway—which has been a longstanding challenge for FAA.

While FAA has undertaken a number of safety initiatives since 2007, reports of incursions have increased, with a 92-percent rise in total incursions reported between fiscal years 2011 and 2018 (see figure 2).¹⁸ In addition, while the number of serious runway incursions is relatively low, there have been several incidents where two aircraft have come within a few feet of colliding with each other, posing significant safety risks.

Figure 2. Total Number of Runway Incursions, Fiscal Years 2011–2018



Source: OIG analysis of FAA data

Last year, we reported¹⁹ that FAA had completed 10 of the 22 runway safety initiatives recommended during a joint Government-industry forum,²⁰ including educating pilots on signs, markings, and other visual aids at airports with identified risk factors.²¹ However, the Agency faces challenges in fully implementing the initiatives still in progress, including dedicating funding and fully implementing new technologies,²² which could take years to complete. In addition, FAA did not establish quantifiable goals to measure the initiatives' effectiveness in reducing runway incursions. As a result, FAA will be limited in its

¹⁸ We have not analyzed how factors such as changes in operational levels and new reporting systems may have contributed to the increase in runway incursions.

¹⁹ *FAA Faces Challenges in Implementing and Measuring the Effectiveness of Its 2015 Runway Safety Call to Action Initiatives* (OIG Report No. AV2018058), June 27, 2018. Self-initiated.

²⁰ FAA initiated a Call to Action forum in 2015 with representatives from industry, labor, and Government. The forum resulted in 22 initiatives intended to mitigate runway incursions and improve safety.

²¹ According to FAA, risk factors that contribute to runway incursions may include unclear taxiway markings, airport signage, and more complex issues such as the runway or taxiway layout.

²² For example, one initiative calls for testing and using new Next Generation Air Transportation System technologies for issuing taxi instructions, such as Data Communications.

ability to prioritize and adjust the initiatives based on their effectiveness. We made three recommendations, including updating target action dates for initiatives still in progress and developing metrics to measure their effectiveness. FAA plans to implement these recommendations by May 2019. Effectively analyzing data, identifying risks, and tracking mitigation actions will remain critical to reduce runway risks.

Strengthening Oversight of UAS in the NAS

The growing demand for UAS commercial operations—ranging from filmmaking and precision agriculture to package delivery—represents a substantial economic opportunity for the United States but also presents one of FAA’s most significant safety challenges. Since initiating UAS registrations in December 2015, FAA has processed more than 1.1 million UAS registrations for commercial operators and hobbyists. Reports of UAS sightings by pilots and other sources have increased significantly in the past few years—from 238 in 2014 to more than 2,350 in 2018.

The Agency has taken many steps to accommodate UAS in the NAS, such as passing a rule²³ permitting small UAS (i.e., under 55 lbs.) to fly commercially, with a number of operational restrictions.²⁴ However, much work remains to safely integrate UAS into the same airspace as manned aircraft. For example, FAA’s rule allows commercial UAS operators to apply for a waiver to conduct higher-risk operations at night, over people, and/or beyond visual line of sight, if the Agency determines the proposed operations can be performed safely. Yet, as we reported last year,²⁵ our analysis of FAA inspections found multiple instances of commercial operators flying their UAS over people and in airspace with manned aircraft without authorization to do so, including over exhibitions and concerts and while performing building inspections.²⁶

Moreover, we found that FAA faces several challenges in developing a risk-based oversight system for commercial UAS operations. While the Agency had developed guidance for its inspectors in planning annual inspections of some UAS operators, FAA’s UAS oversight was neither data-driven nor proactive and lacked key elements of a risk-based oversight system. For example, we reported that FAA’s guidance did not include risk or operational factors (e.g., operating

²³ 14 CFR Part 107 (June 2016).

²⁴ The rule does not permit several potential UAS operations that are highly valued by industry but considered to be higher risk by FAA, such as operating a small UAS beyond line of sight or over people.

²⁵ *Opportunities Exist for FAA To Strengthen Its Review and Oversight Processes for Unmanned Aircraft System Waivers* (OIG Report No. AV2019005), November 7, 2018. Self-initiated.

²⁶ Our analysis of FAA’s inspection record database shows no indication that formal enforcement actions were pursued for any of these specific incidents.

location or frequency of operations) to consider when choosing operators for inspection. Furthermore, FAA had not yet collected sufficient inspection data to conduct a meaningful assessment of safety hazards and develop an overall, baseline risk profile of commercial UAS operating in the NAS. In response to our recommendations, FAA has recently required new, mandated inspections of UAS operators based on data. The Agency must continue to enhance its data collection and analysis to mitigate safety risks in this rapidly evolving industry.

Implementing Congressionally Mandated Aviation Cybersecurity Initiatives To Protect Safety-Critical Systems

Enhancing the safety and security of the NAS also depends on strengthening the Agency's ability to protect against a growing number of cybersecurity threats to FAA's safety-critical systems. Specifically, FAA operates a network of more than 300 information technology systems. This complex network has evolved over the years into an amalgam of diverse legacy radars and newer satellite-based systems for tracking aircraft, as well as a new initiative for controllers and pilots to share information through data link communications.

In 2016, the FAA Extension, Safety, and Security Act²⁷ directed FAA to establish a new "total systems" approach to enhance its ongoing cybersecurity efforts for securing the NAS, including aircraft systems. Our recent work²⁸ shows that FAA has taken initial steps to address the act's requirements, such as completing a strategic plan with cybersecurity goals and objectives, developing a risk model to assess FAA operations, and establishing a research and development (R&D) plan to outline further cyber initiatives. However, FAA will be challenged to continue to implement the risk model across all of its lines of operations, establish priorities for its cyber R&D efforts, and coordinate ongoing efforts with other agencies (such as the Departments of Defense [DOD] and Homeland Security [DHS]) to maximize the Federal investment in cybersecurity research and implement corrective actions to protect the NAS. Accordingly, we will soon begin a review²⁹ of FAA's role and authority in the Aviation Cybersecurity Initiative, a joint taskforce that includes DOD and DHS aimed at identifying and mitigating cyber vulnerabilities in the aviation industry.

²⁷ Pub. L. No. 114-190 (2016).

²⁸ *FAA Has Made Progress but Additional Actions Remain To Implement Congressionally Mandated Cyber Initiatives* (OIG Report No. AV2019021), March 20, 2019. Requested by the House Committee on Transportation and Infrastructure.

²⁹ This was requested by the Chairman of the House Committee on Transportation and Infrastructure.

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

The safety of the NAS also depends on efforts by FAA and the aviation industry to ensure that U.S. aircraft are properly maintained and airworthy. A single passenger aircraft can contain as many as 400,000 parts, and FAA and the aviation industry are responsible for ensuring that all these parts meet established standards and are safe for use. Part of this responsibility is to detect and monitor for Suspected Unapproved Parts (SUPs)—aircraft parts that may have been manufactured without FAA approval, including counterfeit parts. However, our work has identified longstanding challenges with FAA’s processes for overseeing and reducing the risk of SUPs. For example, we reported in 2017³⁰ that FAA’s process for monitoring and investigating SUPs was not as effective as it could be because of recordkeeping weaknesses and the lack of management controls to capture and accurately report the number of SUPs cases. As a result, FAA could not accurately account for the number of SUPs or track safety-related trends about the risks posed by unapproved parts.

Furthermore, FAA’s oversight of industry actions to remove unapproved parts was ineffective because the Agency did not confirm that operators took appropriate action to remove unapproved parts from their inventories. For example, an FAA inspector investigated a case to determine whether tens of thousands of privately owned commercial aircraft parts, which were for sale online, were unapproved. These included safety-critical parts, such as landing gear. However, the inspector did not physically account for the location and quantities of the parts but instead accepted a letter from the owner stating that he had removed the ad from his eBay site and had not sold any parts. FAA concurred with all 11 of our recommendations to strengthen its SUPs program and is working to complete actions to address the remaining three open recommendations by the end of May. Going forward, enhancing the margin of safety will require FAA’s sustained management attention to ensure that the hundreds of thousands of aircraft parts installed on airplanes are manufactured or repaired according to safety standards.

³⁰ *Enhancements Are Needed to FAA’s Oversight of the Suspected Unapproved Parts Program* (OIG Report No. AV2017049), May 30, 2017. Requested by the Ranking Members of the House Committee on Transportation and Infrastructure and its Subcommittee on Aviation.

Conclusion

From certifying a new aircraft to aircraft maintenance to pilot training and beyond, aviation safety is a complex, wide-reaching effort with many moving parts. As the recent Boeing 737 MAX 8 and other accidents draw significant attention to FAA's safety oversight, and as the aviation industry continues to evolve, FAA must ensure it can proactively adapt to new oversight challenges, while also addressing longstanding concerns in safety-critical areas. A strong commitment to risk-based oversight—built on the foundation of a rock-solid safety culture—will be vital to ensure FAA continues to maintain one of the safest aviation systems in the world. As always, we remain committed to supporting FAA and the Secretary as they seek to uphold and enhance the safety of the NAS and protect the traveling public. We will continue to update you on our work on these and related matters.

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

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