STATE OF AVIATION SAFETY

(116–28)

HEARING

BEFORE THE

SUBCOMMITTEE ON
AVIATION

OF THE

COMMITTEE ON TRANSPORTATION AND INFRASTRUCTURE HOUSE OF REPRESENTATIVES

ONE HUNDRED SIXTEENTH CONGRESS

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

Peter A. DeFazio
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JULY 12, 2019

SUMMARY OF SUBJECT MATTER

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

PURPOSE

The Subcommittee on Aviation will meet on Wednesday, July 17, 2019, at 10:00 a.m. in Room 2167 of the Rayburn House Office Building for a hearing on aviation safety. The hearing will gather government and stakeholder perspectives on the state of aviation safety, including identifying current challenges facing the aviation system and actions needed to maintain and ensure the safety of the traveling public. The Subcommittee will first hear testimony from Paul Njoroge, who lost five family members in the Ethiopian Airlines Flight 302 accident this year. Mr. Njoroge will be accompanied by Michael Stumo, who lost his child in the same accident. The Subcommittee will then hear testimony from the National Transportation Safety Board (NTSB), Air Line Pilots Association (ALPA), Association of Professional Flight Attendants (APFA), Professional Aviation Safety Specialists (PASS), and Transport Workers Union (TWU).

BACKGROUND

Each year, more than 800 million people fly safely on U.S. air carriers.[1] While the risk of a fatal commercial aviation accident in the United States has fallen by 95 percent since 1997, serious aviation accidents[2] and incidents[3] still occur regularly in the United States and abroad.[4] According to preliminary NTSB data, there were 219 fatal aviation accidents (365 fatalities and 269 serious injuries) in the United States in 2018, involving U.S.-chartered flights, business jets, general aviation airplanes, balloons, gliders, and helicopters. And in the span of five months, 346 lives were tragically lost abroad in the Lion Air Flight 610 and Ethiopian Airlines Flight 302 accidents alone, both involving U.S.-manufactured aircraft. In total, according to preliminary data, the NTSB has investigated more than 700 aviation accidents that have occurred in the United States involving U.S.-registered or public use aircraft since the Lion Air accident in October 2018. The Federal Government and U.S. aviation industry must remain steadfast in ensuring the highest level of aviation safety and strive for zero deaths in air transportation.

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[1] U.S. Bureau of Transp. Statistics, "Passengers," https://www.transtats.bts.gov/Data_Elements.aspx?Data=1.

[2] The NTSB defines an "accident" as "an occurrence associated with the operation of an aircraft that takes place between the time any person boards the aircraft with the intention of flight and all such persons have disembarked, and in which any person suffers death or serious injury, or in which the aircraft receives substantial damage." 49 C.F.R. § 830.2.

[3] The NTSB defines an "incident" as "an occurrence other than an accident that affects or could affect the safety of operations." *Id.*

[4] There has been one domestic airline passenger fatality in the United States in the past decade. On April 17, 2018, Southwest Airlines Flight 1380 experienced an uncontained engine failure, resulting in loss of an engine inlet and cowling. Engine fragments struck the airplane's fuselage and damaged a cabin window, killing one passenger onboard. Prior to that, the last fatal domestic airline accident occurred in February 2009, when Colgan Air Flight 3407 crashed near Buffalo, New York, killing all 49 onboard and one person on the ground.

RECENT EVENTS

The NTSB—an independent Federal agency charged with investigating civil aviation accidents in the United States and recommending safety improvements—is investigating or assisting in the investigation of recent aviation accidents listed below. This list is non-exhaustive, capturing only select accidents occurring within the past nine months. The list does not include other general aviation accidents or serious incidents the NTSB is investigating or otherwise monitoring.

I. Lion Air Flight 610 and Ethiopian Airlines Flight 302

In the span of five months, there were two fatal commercial airline accidents involving U.S.-designed and manufactured Boeing 737 MAX aircraft operated by foreign air carriers outside the United States.

On October 29, 2018, Lion Air Flight 610 (JT610)—a Boeing 737 MAX—en route to Pangkal Pinang from Jakarta, crashed approximately 11 minutes after takeoff into the Java Sea at 450 miles per hour, killing all 189 on board (184 passengers and 5 crew members). The Indonesian government's final accident report, which will include a determination of the probable cause(s) of the accident, is expected later this year. The NTSB is assisting with this investigation and will have the opportunity to review and comment on the draft final report. The Indonesian government will either amend the draft final report to include the substance of the comments received or, if requested by the United States, append the comments to the final report.[5]

On March 10, 2019, Ethiopian Airlines Flight 302 (ET302)—a Boeing 737 MAX—en route from Bole International Airport in Addis Ababa, Ethiopia, to Nairobi, Kenya, crashed approximately six minutes after takeoff. The accident resulted in the death of all 157 people on board (149 passengers and 8 crew members). The Ethiopian government's final report detailing its determination of probable cause(s) of the accident is expected later this year. The NTSB is also assisting with this investigation and will enjoy the same comment process as for the Indonesian government's report described above.

Immediately following the March 10, 2019, accident, foreign civil aviation authorities began grounding the Boeing 737 MAX planes. On March 13, two days later, and after receiving detailed air traffic data and additional evidence from the scene of the accident, the FAA ordered a temporary grounding of the fleet operated by U.S. airlines or in U.S. territory. The Boeing 737 MAX remains grounded today.

II. Other NTSB Investigations Initiated Since October 2018

- *February 23, 2019, in Trinity Bay, TX*: Boeing 767-375ER operating as Atlas Air 3591 from Miami to Houston crashed near Houston airport, killing all three aboard.[6]
- *March 4, 2019, in Presque Isle, ME*: Embraer EMB-145XR operating as CommutAir Flight 4933 (dba as United Express) from Newark to Presque Isle landed between runway 1 and taxiway A. This was the second approach to runway 1 after having conducted a missed approach during the first approach. Radar track data show that the airplane was aligned right of runway 1 during both approaches. Of the 31 passengers and crew onboard, there were three minor injuries. The airplane was substantially damaged.[7]
- *April 29, 2019, in Kailua, Hawaii*: Robinson R-44 Helicopter crashed into a residential neighborhood, killing all three aboard.[8]
- *May 5, 2019, in Northern Mexico*: Bombardier Challenger 601 jet flying from Las Vegas to Monterrey, Mexico, with three crew members and ten passengers

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[5] *See* International Standards and Recommended Practices, *Annex 13* to the Convention on International Civil Aviation, Aircraft Accident and Incident Investigation, Chapter 6.3, *available at* https://www.emsa.europa.eu/retro/Docs/marine_casualties/annex_13.pdf. *See also* ICAO, *Aircraft Accident Reporting Resources for Media* (Jan. 16, 2017), https://www.icao.int/Newsroom/Documents/ICAO-Fact-Sheet_Accident-Investigation_2017-01.pdf.

[6] *See* NTSB Aviation Accident Preliminary Report, DCA19MA086, *available at* https://app.ntsb.gov/pdfgenerator/ReportGeneratorFile.ashx?EventID=20190223X60222&AKey=1&RType=Prelim &IType=MA.

[7] *See* NTSB Aviation Accident Preliminary Report, DCA19FA089, *available at* https://app.ntsb.gov/pdfgenerator/ReportGeneratorFile.ashx?EventID=20190304X65511&AKey=1&RType=Prelim &IType=FA.

[8] *See* NTSB Aviation Accident Preliminary Report, WPR19FA123, *available at* https://app.ntsb.gov/pdfgenerator/ReportGeneratorFile.ashx?EventID=20190429X61624&AKey=1&RType=Prelim &IType=FA.

crashed in northern Mexico. No survivors were found. The NTSB is assisting foreign authorities.[9]

- *May 13, 2019, in Ketchikan, Alaska*: Havilland DHC-2 Beaver and a float-equipped de Havilland DHC-3 Turbine Otter collided in mid-air. Both were operating for-hire, with six fatalities, nine serious injuries, and one sustaining minor injuries.[10]
- *May 20, 2019, in Metlakatla, Alaska*: Float-equipped de Havilland DHC-2 overturned and partially sank upon landing, killing both aboard.[11]
- *June 10, 2019, in New York City*: Agusta A109E Helicopter departed from East 34th Street Heliport to Linden, NJ, and crashed into the roof of a skyscraper in midtown Manhattan. Pilot was fatally injured.[12]
- *June 21, 2019, in Mokuleia, Hawaii*: Beechcraft King Air A90 crashed shortly after takeoff in Oahu, Hawaii, killing all 11 aboard.[13]
- *June 30, 2019, in Addison, TX*: Beechcraft Super King Air 350 (Addison to St. Petersburg) crashed into an airplane hangar, killing all 10 people aboard.[14]
- *July 4, 2019, in Walker Cay, Bahamas*: Agusta SPA AW139 Helicopter crashed, killing all seven aboard, all of which have been recovered to the Bahamas. The Air Accident Investigation Department of the Bahamas has requested the NTSB lead the investigation.[15]

AVIATION SAFETY ISSUES

In addition to the accidents and safety incidents occurring in U.S. aviation over the past year, below are descriptions of several aviation safety issues being monitored by the Subcommittee on Aviation. Congress addressed some of these issues in the FAA Reauthorization Act of 2018 (Pub. L. 115-254), signed into law on October 5, 2018. *See* APPENDIX 1 for a list of several safety provisions included in the 2018 law.

I. CABIN EVACUATIONS

The Federal Aviation Regulations require that the design of part 125 aircraft, by virtue of the locations and types of emergency exits, must permit all passengers to evacuate the aircraft within 90 seconds with half the exits blocked.[16] Aircraft manufacturers such as Boeing and Airbus are responsible for demonstrating to the FAA's satisfaction that each new aircraft design meets this standard. These manufacturers and global aviation safety regulators, including the FAA and European Union Aviation Safety Agency, often rely on computer analysis, rather than live evacuation drills, to demonstrate compliance.

Recent accidents have raised questions about whether all passengers can, in fact, evacuate an airliner in 90 seconds, given passenger behavioral shifts over the last decade and failure to comply with evacuation instructions. For example, the NTSB concluded that it took *at least* 2 minutes and 21 seconds—51 seconds longer than the FAA assumes—for 161 passengers to evacuate a lightly-loaded American Airlines 767-300ER after an uncontained engine failure and fire at Chicago O'Hare in 2016.[17] In its January 2018 report on that accident, the NTSB concluded that "evi-

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[9] *See* NTSB Identification: CEN19WA137, *available at* https://www.ntsb.gov/__layouts/ntsb.aviation/brief2.aspx?ev__id=20190506X61405&ntsbno=CEN19WA137&akey=1.

[10] *See* NTSB Aviation Accident Preliminary Report, CEN19MA141A, *available at* https://app.ntsb.gov/pdfgenerator/ReportGeneratorFile.ashx?EventID=20190514X70427&AKey=1&RType=Prelim &IType=MA.

[11] *See* NTSB Aviation Accident Preliminary Report, ANC19FA019, *available at* https://app.ntsb.gov/pdfgenerator/ReportGeneratorFile.ashx?EventID=20190520X14645&AKey=1&RType=Prelim &IType=FA.

[12] *See* NTSB Aviation Accident Preliminary Report, ERA19FA191, *available at* https://app.ntsb.gov/pdfgenerator/ReportGeneratorFile.ashx?EventID=20190610X53445&AKey=1&RType=Prelim &IType=FA.

[13] *See* NTSB Aviation Accident Preliminary Report, WPR19MA177, *available at* https://app.ntsb.gov/pdfgenerator/ReportGeneratorFile.ashx?EventID=20190622X23034&AKey=1&RType=Prelim &IType=MA.

[14] *See* NTSB Aviation Accident Preliminary Report, CEN19MA190, *available at* https://app.ntsb.gov/pdfgenerator/ReportGeneratorFile.ashx?EventID=20190630X33829&AKey=1&RType=Prelim &IType=MA.

[15] *See* WASH. POST, *NTSB Takes Over Investigation of Bahamas Helicopter Crash*, July 8, 2019, https://www.washingtonpost.com/national/ntsb-takes-over-investigation-of-bahamas-helicopter-crash/2019/07/08/f693b94e-a1c2-11e9-a767-d7ab84aef3e9__story.html?utm__term=.d25f55aba44f.

[16] *See* 14 C.F.R. §§ 25.803, 25.807; 14 C.F.R. part 25, app'x. J.

[17] NTSB/AAR-18/01, *Uncontained Engine Failure and Subsequent Fire, American Airlines Flight 383, Boeing 767-323, N345AN, Chicago, Illinois, October 28, 2016*, at 27 (2018).

dence of passengers retrieving carry-on baggage during this and other recent emergency evacuations demonstrates that previous FAA actions to mitigate this potential safety hazard have not been effective." [18]

In addition to passengers' apparent propensity to evacuate with their carry-on bags and film evacuation efforts, smaller seat sizes in newly manufactured or refurbished aircraft may affect cabin evacuation times. The FAA has not regulated seat dimensions, having traditionally asserted that it is responsible for regulating safety, not comfort, imposing "minimum standards required in the interest of safety." [19]

The FAA Reauthorization Act of 2018 requires the FAA to review its aircraft cabin evacuation certification and report to Congress with results and any recommendations for revisions to the agency's assumptions and methods for assessing evacuation certification.[20] In addition, the law requires the FAA to issue regulations establishing minimum dimensions for passenger seats necessary for the safety of passengers.[21]

II. RUNWAY SAFETY

In multiple incidents in the span of six months, airliners either landed or almost landed on taxiways or incorrect runways. On July 7, 2017, an Air Canada flight crew lined up with a crowded taxiway instead of the landing runway at San Francisco International Airport and performed a go-around less than 100 feet above the ground, narrowly missing the tail of a Boeing 787 loaded with passengers and awaiting takeoff. On November 29, 2017, a Delta Air Lines flight on approach to the Hartsfield-Jackson Atlanta International Airport in poor visibility also lined up with a taxiway instead of the landing runway and performed a missed approach at low altitude. And on December 29, 2017, a Horizon Air flight on approach at night to the Pullman, Washington, airport actually landed on the taxiway instead of the runway.

The FAA Reauthorization Act of 2018 requires the FAA to report to Congress on improving runway safety, which will include a review of systems capable of detecting wrong surface alignment and an assessment of technologies that could be used at airports to provide a direct warning to flight crews or air traffic controllers of potential runway incursions.[22]

III. LITHIUM BATTERIES

Lithium batteries transported as cargo pose special risks to the safety of flight. When ignited, either through self-induced thermal runaway within a single cell or by an independent source, they burn at extremely high temperatures, and in some cases, traditional fire suppressants cannot extinguish the ensuing fire. FAA testing in 2015 established that if ignited, just eight lithium-ion batteries at 50 percent charge in the cargo hold of a passenger airplane can and likely *will* bring down the aircraft. Moreover, in a joint submission to the International Civil Aviation Organization (ICAO) Dangerous Goods Panel in April 2015, the world's largest airframe manufacturers cautioned that "continuing to allow the carriage of lithium batteries within today's transport category aircraft cargo compartments is an unacceptable risk to the air transport industry." [23]

Recognizing the safety hazards associated with lithium battery shipments, ICAO member states voted to ban bulk shipments of lithium batteries from the cargo holds of passenger jets in 2016 until safety regulators and airframe manufacturers can understand more about preventing and containing lithium-fed fires. ICAO member states are also considering whether to ban portable electronic devices (PEDs) in checked baggage, because lithium batteries in those devices could catch fire and burn undetected. A U.S. submission in October 2017 to the ICAO Dangerous Goods

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[18] *Id.* at 66. The Board found that "some passengers evacuated from all three usable exits with carry-on baggage. In one case, a flight attendant tried to take a bag away from a passenger who did not follow the instruction to evacuate without baggage, but the flight attendant realized that the struggle over the bag was prolonging the evacuation and allowed the passenger to take the bag. In another case, a passenger came to the left overwing exit with a bag and evacuated with it despite being instructed to leave the bag behind." *Id.* at 65. The Board recommended that "the FAA conduct research to (1) measure and evaluate the effects of carry-on baggage on passenger deplaning times and safety during an emergency evacuation and (2) identify effective countermeasures to reduce any determined risks, and implement the countermeasures." *Id.* at 66.

[19] 49 U.S.C. § 44701(a)(1).

[20] Pub. L. No. 115-254, § 337 (2018).

[21] *Id.* § 577.

[22] *Id.* § 334.

[23] INT'L COORDINATION COUNCIL FOR AEROSPACE INDUSTRIES ASS'NS, WORKING PAPER ON TRANSPORT OF LITHIUM BATTERIES AS CARGO BY AIR, DGP-WG/15-WP/4 (2015) (presented before the ICAO Dangerous Goods Panel).

Panel stated that FAA testing "indicates that large PEDs in checked baggage mixed with an aerosol can produce an explosion and fire that the aircraft cargo fire suppression system . . . may not be able to safely manage," leading to "the loss of the aircraft."[24] The Panel was unable to reach consensus and now is waiting for further direction from the ICAO Council.

Some have expressed concern that ICAO standards have not kept pace with our growing knowledge of the safety hazards of bulk shipments of lithium batteries in aircraft. The 2012 FAA reauthorization act included a prohibition on any U.S. rulemaking in excess of ICAO standards unless an accident has occurred, where there is credible reporting that batteries were present, not packed and transported in accordance with ICAO technical instructions, and substantially contributed to the initiation or propagation of onboard fire.[25]

While the FAA Reauthorization Act of 2018 did not address the 2012 prohibition on U.S. rulemaking, the law requires the FAA to conform U.S. regulations on the air transport of lithium batteries with 2016 ICAO standards, banning them as cargo on passenger aircraft.[26] The FAA Reauthorization Act of 2018 also directs the Secretary of Transportation to establish a lithium battery safety working group to promote efforts related to the promotion of the safe manufacture, use, and transportation of lithium batteries and cells, in addition to a lithium ion and lithium metal battery safety advisory committee to facilitate communication between manufacturers, air carriers, the Federal Government, and others regarding the safe air transportation of lithium ion and lithium metal cells and batteries and provide the Secretary with timely information about new lithium metal battery technology and transportation safety practices and methodologies.[27]

IV. FLIGHT CREW REST

A. Cargo Pilots

In 2012, the FAA finalized a long-delayed rule to strengthen restrictions on the amount of time airline pilots can spend at the controls and on duty.[28] The rule was one of several required under the Airline Safety and Federal Aviation Administration Extension Act of 2010 (Pub. L. 111-216), enacted in response to the Colgan Flight 3407 accident. Notably, at the end of a lengthy rulemaking process, the FAA determined that the 2012 fatigue rule would apply only to pilots in all-passenger operations and not to pilots at all-cargo carriers such as FedEx and UPS. Although the FAA initially proposed to apply the same flight and duty time limits to all airline pilots, the FAA and the Office of Management and Budget concluded after analysis that the costs of applying the new limits to all-cargo pilots would inordinately exceed the benefits.

B. Flight Attendants

While pilots for U.S. commercial airlines must be provided a rest period of at least 10 consecutive hours preceding a flight duty period,[29] the same is not true for flight attendants, despite their important safety duties. The first rule for flight attendant duty period limitations and rest requirements was promulgated in 1994[30] and has not been updated since. This rule allows a flight attendant to remain on duty for 14 hours with only an eight-hour break between flights.

The FAA Reauthorization Act of 2018 requires a 10-hour minimum rest period for flight attendants between duty periods, establishing parity with pilots. The provision also requires airlines to adopt and submit to the FAA for acceptance fatigue

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[24] Angela Stubblefield (FAA), *Portable Electronic Devices Carried by Passengers and Crew* (Oct. 27, 2017), *available at* https://www.icao.int/safety/DangerousGoods/DGP26/DGP.26.WP.043.2.en.pdf.

[25] FAA Modernization and Reform Act of 2012, Pub. L. No. 112-95, § 828 (2012). In 2010, UPS Flight 006, a Boeing 747-400F with a cargo of lithium batteries, crashed in Dubai after an in-flight fire propagated so quickly and generated such dense smoke that one pilot was incapacitated and the other lost the ability to see flight instruments and maintain controlled flight while maneuvering for an emergency landing. In 2011, Asiana Cargo Flight 991, also a Boeing 747-400F with a cargo of lithium batteries, crashed in the Korea Strait after the crew reported an in-flight fire.

[26] Pub. L. No. 115-254, § 333.

[27] *Id.*

[28] 77 Fed. Reg. 330 (Jan. 4, 2012).

[29] *See* 14 C.F.R. part 117.

[30] 59 Fed. Reg. 42974 (Aug. 19, 1994). *See also* 60 Fed. Reg. 52625 (Oct. 10, 1995) (detailing the date of compliance with respect to the duty limitations and rest requirements in the 1994 final rule).

risk management plans, similar to those adopted for pilots, to reduce the incidence of fatigue among flight attendants.[31]

V. AIRCRAFT CERTIFICATION

All aircraft and aviation products are subject to FAA certification prior to their sale and use in the United States. The FAA is responsible for regulating aviation safety, which includes approving the U.S. design and manufacture of new aircraft and aviation products before they enter service.[32]

Since even before the FAA was formed over 60 years ago, the Federal Government has delegated some safety certification responsibilities to technical experts in the industry. As airplanes, engines, and their constituent systems became increasingly complex, Congress authorized the FAA to leverage the product-specific knowledge among appropriately-qualified employees of manufacturers to determine a new product's compliance with the applicable provisions of the Federal Aviation Regulations. A designee may receive authority to examine, inspect, and test aircraft and persons for the purpose of issuing certificates.[33]

The delegation program allows the FAA to leverage limited resources to focus on the areas of highest-risk and make timely certification decisions. According to the Government Accountability Office (GAO), in terms of the breadth or scope, FAA designees are able perform more than 90 percent of FAA's certification activities.[34] However, the FAA has the ultimate responsibility to oversee delegated activities and to certify aircraft.

Following the Lion Air and Ethiopian Airlines accidents described above, significant Congressional and public attention has been placed on the FAA's certification and delegation processes, including whether the agency is performing sufficient oversight over these processes. The FAA Reauthorization Act of 2018 included multiple provisions aimed at improving these areas.

For example, the FAA Reauthorization Act of 2018 establishes the Safety Oversight and Certification Advisory Committee (SOCAC) comprised of various aviation stakeholders to provide advice and recommendations to the Secretary of Transportation on ways to improve the FAA's certification and oversight processes;[35] an expert review panel to assess these activities;[36] and a safety workforce training strategy to ensure appropriate workforce training, identify a systems safety approach to oversight, and foster an experienced and knowledgeable inspector and engineer workforce, among other things.[37]

VI. FOREIGN REPAIR STATIONS

In several reports since 2003, and most recently in 2015, the Department of Transportation (DOT) Inspector General (IG) has identified weaknesses in the FAA's oversight of FAA-certificated overseas repair stations where mechanics work on U.S. air carriers' fleets.[38] Specifically, "[r]epair stations conduct a range of repairs and maintenance, from critical components—such as landing gear and engine overhauls—to heavy airframe checks, which involve a complete teardown and overhaul of the aircraft."[39]

Airlines' spending on contract maintenance and repair services nearly tripled between 1996 and 2011, the DOT IG reported, rising from $1.5 billion in 1996 to $4.2 billion in 2011.[40] Today, "[i]t is estimated that nearly 50 percent by dollar volume of maintenance work done by operators of U.S. registered aircraft is done in . . . FAA certified repair facilities located outside" the United States, according to one associa-

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[31] Pub. L. No. 115-254, § 335.

[32] *See* 49 U.S.C. §§ 44702, 44704; GAO, *Aviation Manufacturing: Status of FAA's Efforts to Improve Certification and Regulatory Consistency* (July 31, 2014), GAO-14-829T, at 1.

[33] GAO-14-829T at 4.

[34] GAO, *Aviation Safety: FAA Efforts Have Improved Safety, but Challenges Remain in Key Areas* (Apr. 16, 2013), GAO-13-442T, at 3-4. In a May 7, 2019, email to Committee staff, the GAO clarified that the 90 percent number refers to the breadth or scope of FAA activities on which designees can do rather than the amount of certification work done by designees.

[35] Pub. L. No. 115-254, § 202.

[36] *Id.* § 213.

[37] *Id.* § 231.

[38] *See* Dep't of Transp. Office of Inspector General, *FAA Has Not Effectively Implemented Repair Station Oversight in the European Union*, Rpt. No. AV-2015-066 (2015); Dep't of Transp. Office of Inspector General, *FAA Continues to Face Challenges in Implementing a Risk-Based Approach for Repair Station Oversight*, Rpt. No. AV-2013-073 (2013); Dep't of Transp. Office of Inspector General, *Air Carriers' Outsourcing of Aircraft Maintenance*, Rpt. No. AV-2008-090 (2008); Dep't of Transp. Office of Inspector General, *Review of Air Carriers' Use of Aircraft Repair Stations*, Rpt. No. AV-2003-047 (2003).

[39] Rpt. No. AV-2013-073 (2013), at 1 n.2.

[40] *Id.* at 1.

tion.[41] The DOT IG found in 2013 that the FAA's repair station oversight "lacks the rigor needed to identify deficiencies and verify that they have been addressed."[42] The DOT IG concluded that "[u]ncorrected maintenance deficiencies such as these could lead to the use of improperly repaired aircraft parts on U.S. air carriers" and that "some repair stations may not be operating in full compliance with Federal aviation regulations."[43]

The FAA reauthorization acts in 2012 and 2016, through several provisions, addressed the FAA's foreign repair station oversight. For example, in 2012, Congress directed that employees who perform safety-sensitive functions at foreign repair stations be subject to a level of screening for drug and alcohol use equivalent to the screening required in the United States and consistent with the applicable laws of the country in which the repair station is located.[44] While the FAA published in 2014 an advance notice of proposed rulemaking on this subject,[45] the agency has taken no further action to date. In addition, in 2016, Congress required the FAA to ensure that each foreign repair station worker who performs safety-sensitive work has undergone a pre-employment background investigation sufficient to determine that the individual is not a threat to aviation safety.[46] The FAA has not yet implemented this mandate either.

VII. Integration of New Entrants

A. Commercial Space

Commercial space transportation—the use of orbital and suborbital vehicles owned and operated by private companies or other non-Federal organizations[47]—moves objects such as satellites and cargo, scientific payloads, and passengers to, from, and in space.[48] The FAA's Office of Commercial Space Transportation (AST) is the office responsible for regulating the launch and reentry components of the U.S. commercial space transportation industry.

In addition to regulating this industry to protect public health and safety, safety of property, and national security and foreign policy interests of the United States, the FAA is also required to encourage, facilitate, and promote the industry. The FAA operated under a similar "dual mandate" with respect to civil aviation from its inception in 1958 until 1996, when investigations of the ValuJet Flight 592 and Trans World Airlines Flight 800 accidents prompted Congress to eliminate the FAA's statutory duty to "promote" as well as regulate the civil aviation industry.

The FAA's responsibility for protecting people and property on the ground and in U.S. airspace is critical. An accident involving a spacecraft during launch or reentry can present a serious risk to people on the ground. An example is the wreckage of the Space Shuttle Columbia, which broke apart during reentry on February 1, 2003. Parts of the shuttle were scattered through East Texas, Louisiana, and Arkansas, with one piece of wreckage—an 800-pound main engine piece—hitting the ground at nearly 1,400 miles per hour, and another 600-pound engine component impacting the ground with enough force to create a six-foot crater.

To ensure public safety, the FAA accommodates commercial space transportation launches and reentries by establishing aircraft hazard areas across wide swaths of airspace. These hazard areas generally preclude operations by aircraft for several hours surrounding a launch window, which can result in flight delays and ground stops. As launch cadences increase, disruptions to NAS operations will become more frequent and potentially more severe. The FAA is working with the aviation and commercial space transportation communities to better integrate, rather than accommodate, commercial space launches into the normal operation of the NAS. With new technologies and improved understanding of commercial space transportation launch vehicle performance, the size and duration of hazard areas can be reduced while maintaining and improving aviation safety.

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[41] Transport Workers Union, *Risks Associated with Foreign Repair Stations*, May 21, 2018, *available at* https://www.twu.org/wp-content/uploads/2018/05/Risks-Associated-with-Foreign-Repair-Stations.pdf.

[42] Rpt. No. AV-2013-073 (2013), at 2-3.

[43] *Id.* at 3.

[44] Pub. L. No. 112-95, § 308 (2012) (codifying 49 U.S.C. § 44733).

[45] 79 Fed. Reg. 14621 (Mar. 17, 2014).

[46] FAA Extension, Safety, and Security Act of 2016, Pub. L. No. 114-190, § 2112(c).

[47] FAA, Office of Commercial Space Transportation, *Commercial Space Transportation Industry*,https://www.faa.gov/about/office_org/headquarters_offices/ast/industry/.

[48] FAA, *The Economic Impact of Commercial Space Transportation on the U.S. Economy in 2009* at 8 (Sept. 2010).

B. Unmanned Aircraft

Unmanned aircraft systems (UAS), or drones, can be small and lightweight, inexpensive, easy to operate, and equipped with various technologies, such as cameras and infrared or thermal sensors, that unlock a virtually unlimited number of applications. While UAS have a large economic and social impact, they can also pose a risk to the safety of the NAS. The FAA receives more than 100 UAS sighting reports each month,[49] although reports cannot all be verified.[50] The volume of reported sightings still reflects the continuing risk of collision between UAS and manned aircraft near airports, critical infrastructure, and over populated areas. While there have been collisions between UAS and manned aircraft,[51] no resulting fatalities or injuries have been reported in the United States.

A collision between a UAS and manned aircraft could be catastrophic. In 2017, the FAA's Center of Excellence for UAS Research, ASSURE, released the results of its first phase of research evaluating the severity of the risk of collisions between UAS and manned aircraft. The initial findings—based on a collision between a small UAS and airframe parts only—showed that a conventional aircraft's collision with even a small UAS could result in severe damage to aircraft structures. The structural damage would be greater than that caused by a bird strike of an equivalent impact energy level.[52]

The FAA Reauthorization Act of 2018 contained multiple provisions aimed at reducing the safety risks that UAS can pose to the NAS and its users.[53] Most notably, the law establishes a statutory framework for the regulation of model aircraft flown for hobby or recreational purposes, including requiring operators of these UAS to pass an aeronautical knowledge and safety test and seek FAA authorization before flying in controlled airspace (e.g., near airports). The framework further allows the FAA to issue any requirement on these operators necessary to ensure the safety and security of U.S. airspace, which includes mandating their UAS be equipped with specific technologies that allow for electronic identification and tracking of the operator.[54]

WITNESSES

PANEL 1

- Mr. Paul Njoroge, on behalf of the Families of Ethiopian Airlines Flight 302, Husband of Carolyne Karanja, Father of Ryan Njuguna, Kelli Pauls, Rubi Pauls, and Son-in-Law of Anne Karanja, Victims of Flight ET302
  - *Accompanied by* Mr. Michael Stumo, Father of Samya Stumo, Victim of Flight ET302

PANEL 2

- Ms. Dana Schulze, Acting Director, Office of Aviation Safety, National Transportation Safety Board
- Capt. Joe DePete, President, Air Line Pilots Association, International
- Ms. Lori Bassani, National President, The Association of Professional Flight Attendants
- Mr. Mike Perrone, National President, Professional Aviation Safety Specialists
- Mr. John Samuelsen, International President, Transport Workers Union

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[49] FAA, *UAS Sightings Report*, https://www.faa.gov/uas/resources/public__records/uas__sightings__report/.

[50] *See* GAO, *Small Unmanned Aircraft Systems, FAA Should Improve Its Management of Safety Risks*, GAO-18-110 (May 2018). The FAA informed the GAO that it does not attempt to validate all UAS reports received and that some of the reports may have in fact involved authorized UAS operating in a safe manner.

[51] For example, in 2017, a UAS collided with and damaged a U.S. Army UH-60 Black Hawk helicopter near Staten Island, New York, and another UAS struck a commercial plane with eight passengers onboard as it approached Jean Lesage International Airport in Québec City, Canada.

[52] *See* ASSURE, UAS AIRBORNE COLLISION SEVERITY EVALUATION FINAL REPORT (Nov. 2017), *available at* http://assureuas.org/projects/deliverables/sUASAirborneCollisionReport.php.

[53] *See*, e.g., Pub. L. No. 115-254, § 345 (establishing a process for the FAA to accept risk-based consensus safety standards for the design and production of UAS); § 335 (authorizing funding for the FAA's "Know Before You Fly" educational campaign to broaden UAS safety awareness); § 363 (prohibiting UAS from being armed or equipped with dangerous weapons); § 382 (creating a criminal penalty for UAS interference with wildfire suppression or emergency response efforts); § 384 (creating a criminal penalty for UAS interference with aircraft carrying one or more occupants).

[54] *See id.* § 349.

APPENDIX 1.

SUMMARY OF SELECT AVIATION SAFETY PROVISIONS INCLUDED IN THE FAA REAUTHORIZATION ACT OF 2018 (PUB. L. 115-254).

TITLE II—FAA SAFETY CERTIFICATION REFORM

• *Sec. 202—Safety Oversight and Certification Advisory Committee*
This section establishes a Safety Oversight and Certification Advisory Committee (SOCAC) comprised of various aviation stakeholders and the FAA. The SOCAC is charged with providing advice and recommendations to the Secretary of Transportation to improve aircraft certification and oversight processes, including workforce development, among other things.

• *Sec. 213—ODA Review*
This section establishes an expert review panel to conduct a survey of organization designation authorization (ODA) holders and receive feedback on FAA's efforts involving the ODA program and make recommendations to improve the program. The FAA is required to submit a report to Congress on its findings.

• *Sec. 216—ODA Staffing and Oversight*
This section directs the FAA to report on ways to identify and improve ODA oversight staffing and resource needs.

• *Sec. 222—FAA Task Force on Flight Standards Reform*
This section directs the FAA to establish the Task Force on Flight Standards Reform comprised of industry stakeholders. It is charged with providing recommendations for improvements to flight standards processes, training for aviation safety inspectors, and achieving regulatory consistency.

• *Sec. 231—Safety Workforce Training Strategy*
This section establishes a safety workforce training strategy designed to create an effective risk-based approach to safety oversight, utilize best available resources, ensure appropriate training, identify a systems safety approach to oversight, foster an experienced and knowledgeable inspector and engineer workforce, and seek knowledge-sharing opportunities between the FAA and industry.

TITLE III—SAFETY

• *Sec. 303—Safety Critical Staffing*
This section instructs the DOT Inspector General to conduct an audit of the staffing model used by the FAA to determine the number of aviation safety inspectors that are needed to fulfill the mission of the FAA and adequately ensure aviation safety. Upon the completion of this audit, the DOT IG is required to report the results to Congress.

• *Sec. 305—Aircraft Data Access and Retrieval Systems*
This section requires the FAA to conduct a study of aircraft data access and retrieval technologies for commercial aircraft used in extended overwater operations to determine if such technologies provide improved access and retrieval of the data in the event of an accident. The FAA is required to report to Congress on the results of the study.

• *Sec. 307—Emergency Medical Equipment on Passenger Aircraft*
This section requires the FAA to evaluate and revise, as appropriate, the regulations regarding the onboard emergency medical equipment requirements, including the contents of the first-aid kit. In conducting this evaluation, the FAA would consider whether the minimum contents of approved emergency medical kits include appropriate medications and equipment to meet the emergency medical needs of children.

• *Sec. 308—FAA and NTSB Review of General Aviation Safety*
This section requires the FAA and NTSB to study general aviation safety, including a review of all general aviation accidents since 2000. Based on the results of this study, the FAA, in consultation with the NTSB, shall make recommendations to address general aviation safety issues, protect persons and property on the ground, and improve the safety of general aviation operators. These recommendations should subsequently be submitted in a report to Congress.

• *Sec. 309—Call to Action Airline Engine Safety Review*
This section directs the FAA to initiate a Call to Action safety review for airline engine safety with stakeholders to discuss best practices and implement actions to address airline engine safety. The Administrator will submit a report to Congress on the results of the review.

• *Sec. 311—Part 135 Accident and Incident Data*
This section requires the FAA to determine, in collaboration with the NTSB and part 135 industry stakeholders (commuter, on demand or air tour operators), what, if any, additional data should be reported as part of an accident or incident notice. The FAA shall then submit a report to Congress on its findings in an effort to more accurately measure the safety of on-demand part 135 aircraft activity, to pinpoint safety problems, and to form the basis for critical research and analysis of issues for more risk-based, data driven safety oversight.

• *Sec. 315—Aviation Rulemaking Committee for Part 135 Pilot Rest and Duty Rules*
This section establishes a rulemaking committee comprised of industry representatives, labor organizations, and safety experts to review and provide recommendations on pilot rest and duty rules for operations in part 135. The section further requires the FAA to submit a report to Congress on the committee's findings and issue a notice of proposed rulemaking based on the consensus recommendations of the committee.

• *Sec. 317—Helicopter Fuel System Safety*
This section requires that all newly manufactured helicopters meet certain standards to improve helicopter fuel system crash resistance within 18 months of the bill's enactment.

• *Sec. 318—Applicability of Medical Certification Standards to Operators of Air Balloons*
This section requires second-class medical certifications for operators of a commercial air balloon.

• *Sec. 320—Voluntary Reports of Operational or Maintenance Issues Related to Aviation Safety*
This section requires the FAA to automatically accept voluntary disclosures of operational or maintenance issues submitted under the Aviation Safety Action Program even if they have not undergone a review by the event review committee; however, these disclosures will have disclaimers that they have not gone through review. If the event review committee determines that the disclosure fails to meet criteria for acceptance, the disclosure will be rejected.

• *Sec. 324—Comptroller General Report on FAA Enforcement Policy*
This section directs the Government Accountability Office (GAO) to conduct a study on the impact of a June 2015 order changing FAA's Compliance Policy and report to Congress on whether reports of safety incidents increased and whether reduced enforcement penalties increased the overall number of safety incidents that occurred.

• *Sec. 325—Annual Safety Incident Report*
This section requires the FAA submit for the next six years an annual report to Congress describing the FAA's safety oversight process, the risk-based oversight methods applied to ensure aviation safety, and in the instance of specific reviews of air carrier performance to safety regulations, a description of the cases where the timelines for recurrent reviews are advanced.

• *Sec. 326—Aircraft Air Quality*
This section directs the FAA, in consultation with relevant stakeholders, to establish and make available on a website, educational materials for flight attendants, pilots, and aircraft maintenance technicians on how to respond to incidents on board aircraft involving smoke or fumes. This section also requires the FAA to issue guidance on reporting incidents of smoke or fumes on board an aircraft, and requires the FAA to commission a study by the Airliner Cabin Environment Research Center of Excellence on bleed air in the cabins of commercial aircraft.

• *Sec. 328—Report on Airline and Passenger Safety*
This section requires the FAA to submit a report on airline and passenger safety, including the overall use, age, and flight hours of commercial aircraft, the impact of metal fatigue on usage and safety, a review of contractor assisted maintenance, and a re-evaluation of rules regarding inspection of aging airplanes.

• *Sec. 330—Report and Recommendations on Certain Aviation Safety Risks*
This section directs the FAA to submit a report that identifies safety risks associated with airport power outages and recommends actions to improve resilience of aviation systems in such events, and reviews alert systems for pilots and air traffic controllers in the event of a failure of runway lights and provides recommendations on further implementation of these systems.

• *Sec. 333—Safe Air Transportation of Lithium Cells and Batteries*

This section directs the Secretary to ensure shippers of lithium ion and lithium metal batteries for air transport comply with ICAO Technical Instructions and Hazardous Material Regulations in the U.S. and work with international partners to ensure enforcement of regulations. It also allows exceptions for transportation of medical device batteries, and it establishes the Lithium Ion Battery Safety Working Group and the Lithium Battery Air Safety Advisory Committee to facilitate communications between and among key stakeholders regarding the effectiveness and economic impacts of regulation of the transportation of lithium ion cells and batteries.

• *Sec. 334—Runway Safety*
This section requires the FAA, in consultation with the NTSB, to submit a report to Congress on improving runway safety.

• *Sec. 335—Flight Attendant Duty Period Limitations and Rest Requirements*
This section requires the FAA to ensure a flight attendant scheduled to a duty period of 14 hours or less is given a scheduled rest period of at least 10 consecutive hours. The rest period cannot be reduced under any circumstances, and airlines are also required to develop fatigue risk management plans for flight attendants.

• *Sec. 336—Secondary Cockpit Barriers*
This section requires the FAA to issue an order requiring the installation of secondary cockpit barriers on all new passenger aircraft.

• *Sec. 337—Aircraft Cabin Evacuation Procedures*
This section requires the FAA to review the evacuation certification of transport-category aircraft. In conducting this review, the FAA is required to consult with the NTSB, relevant aircraft manufacturers, air carriers, and other relevant experts and Federal agencies, and is required to review relevant data with respect to evacuation certification. At the review's conclusion, FAA must submit a report to Congress.

• *Sec. 339A—National In-Flight Sexual Misconduct Onboard Aircraft*
This section establishes a Task Force comprised of relevant stakeholders and federal agencies to develop recommendations for air carriers in regard to training, reporting and collecting of data for incidents of allegations of sexual misconduct that occur on flights.

• *Sec. 339B—Reporting Process for Sexual Misconduct Onboard Aircraft*
This section directs the Attorney General to establish a streamlined reporting process for the reporting of incidents of alleged sexual misconduct onboard aircraft.

TITLE IV—UNMANNED AIRCRAFT SYSTEMS

• *Sec. 349—Exception for Limited Recreational Operations of Unmanned Aircraft*
This section creates a framework for the safe operation of recreational unmanned aircraft, including operating requirements, aeronautical knowledge and safety testing, and the qualifications for community-based organizations that support recreational activities. The section allows the FAA to regulate any unmanned aircraft in order to ensure the safety and security of the National Airspace System.

STATE OF AVIATION SAFETY

WEDNESDAY, JULY 17, 2019

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

The subcommittee met, pursuant to call, at 10:02 a.m., in room 2167, Rayburn House Office Building, Hon. Rick Larsen (Chairman of the subcommittee) presiding.

Mr. LARSEN. The subcommittee will come to order.

I ask unanimous consent the chair be authorized to declare a recess during today's hearing. Without objection, so ordered.

I ask unanimous consent that Members not on the subcommittee be permitted to sit on the subcommittee for today's hearing and ask questions. Without objection, so ordered.

Good morning, and thank you to today's witnesses for joining the subcommittee's hearing today on the state of aviation safety.

Recent tragic aviation incidents at home and abroad have shed new light on what is required to ensure the safety of the traveling public.

In addition, the integration of new entrants, such as drones, into the national airspace now present new safety and security challenges.

Last Congress this committee passed the Federal Aviation Administration or the FAA Reauthorization Act of 2018, bipartisan legislation which set a solid foundation to improve the safety of the Nation's airports, pilots, crew, and passengers.

Today's hearing is an opportunity to get the public's perspective on current risks and challenges facing our aviation system and necessary safety improvements.

This testimony will also shape our priorities as we continue our investigation into the Boeing 737 MAX and the oversight of the FAA's implementation of last year's FAA reauthorization bill.

For the sake of time, I am just going to speak first about panel two, and then shift to the first panel.

So later this morning, we are going to hear from a second panel, and this fall the committee will discuss the implementation of the FAA Reauthorization Act.

So later at today's hearing, the subcommittee will hear from witnesses on that second panel who are on the front lines of aviation and are critical to ensuring the safety of U.S. aviation. Their testimony will help us prioritize issues for oversight on that legislation.

So from the NTSB, when they testify about recommendations outlined in the NTSB Most Wanted List of Transportation Safety

Improvements, I particularly want to hear about part 135 flight ops and ensuring the safe integration of new technologies.

As Congress works to improve the pipeline for the next generation of pilots, debate continues on the strong pilot training rules requiring 1,500 hours of flight time mandated after the Colgan crash.

Congress cannot undermine our safety rules simply to respond to market forces of supply and demand. If there is a pilot shortage, I am interested in hearing ALPA's thoughts on ways to address that without sacrificing safety.

Flight attendant fatigue is a pressing aviation issue; however, the FAA continues to delay the implementation of a mandate requiring at least 10 consecutive hours of rest for flight attendants between duty periods. So I want hear from the Association of Professional Flight Attendants about the immediate and long-term impacts of that inaction.

And as evidenced by recent events, the FAA certification process is critical to aviation safety. So Professional Aviation Safety Specialists can shed more light about that role of safety inspectors and engineers in the process and improvements that are necessary to ensure the safety of U.S. aircraft.

And last week Chair DeFazio and Vice Chair Davids, Congressmen Davis and Ferguson and I introduced the Fair and Open Skies Act to prevent foreign air carriers from exploiting a "flag of convenience" to avoid the regulation of the home countries or otherwise undermine labor standards.

So when we get to the panel, I would appreciate Transportation Workers Union, as well as ALPA and APFA's, support of this bill and on behalf of the committee would like to hear more about the importance of maintaining strong labor protections on safety.

I now want to turn to the first panel.

The issue of the 737 MAX is not just about stakeholders in the aviation industry. This committee is a public body and therefore has a responsibility to hear from those most impacted, which, unfortunately, includes at times of tragedy.

And on today's first panel are Mr. Paul Njoroge and Mr. Michael Stumo, who both lost family in the Ethiopian Airlines flight 302 or ET 302 crash, which itself claimed the lives of 157 people.

Chair DeFazio and I asked Mr. Njoroge to testify today on behalf of ET 302 families and to give a voice to the 157 victims of that tragic accident.

Mr. Njoroge and Mr. Stumo, I can't imagine the immeasurable grief that you and your families are experiencing. So on behalf of the entire committee, for Members here today and for those who can't join us, I want to extend our sincerest condolences to both of you and your families and all the families during this very difficult time, and we appreciate your willingness to come testify in front of our committee.

Your testimony is a crucial reminder of the international role the U.S. aviation system operates within. These crashes occurred on U.S.-made, U.S.-assembled, U.S.-regulated airplanes. The FAA's actions and this committee's efforts clearly have implications for travel around the world.

A majority of the victims of ET 302 and Lion Air 610 were not Americans, and therefore it is only right to hear from someone who

can better represent the global community impacted by these tragedies.

So I want to thank you, Mr. Njoroge, for coming in from Canada last night. Thank you for meeting with us, with Ranking Member Graves and I last night as well. Mr. Stumo as well.

And I want to as well recognize Tor Stumo, who is here, Michael's son and Nadia's son.

Tomra Vecere is in the audience and her husband Charles. She lost her brother Matthew as well.

And there are, of course, many other family members who are not here but are certainly represented in our thoughts, our prayers, and in today's testimony.

With that, I want to turn to the ranking member, Garret Graves, for opening comments.

[Mr. Larsen's prepared statement follows:]

Prepared Statement of Hon. Rick Larsen, a Representative in Congress from the State of Washington, and Chair, Subcommittee on Aviation

Good morning and thank you to today's witnesses for joining the Subcommittee's hearing on the "State of Aviation Safety."

Recent tragic aviation incidents at home and abroad have shed new light on what is required to ensure the traveling public's safety.

In addition, the integration of new entrants, such as drones, into the national airspace presents new safety and security challenges.

Last Congress, this Committee passed the Federal Aviation Administration (FAA) Reauthorization Act of 2018, bipartisan legislation which set a solid foundation to improve the safety of the nation's airports, pilots, crew and passengers.

Today's hearing is an opportunity to get the public's perspective on current risks and challenges facing our aviation system and necessary safety improvements.

The testimony will also help shape our priorities as we continue our investigation of the Boeing 737 MAX and oversight of the FAA's the implementation of last year's FAA reauthorization bill.

This fall, the Committee will discuss the implementation status of the FAA Reauthorization Act.

Later on during today's hearing, the Subcommittee will hear from witnesses on the second panel, who are on the frontlines of aviation and are critical to ensuring the safety of U.S. aviation. Their testimony will help us prioritize issues for oversight on the legislation.

I look forward to hearing more from the National Transportation Safety Board (NTSB) about the recommendations outlined in the NTSB Most Wanted List of Transportation Safety Improvements for 2019-2020, particularly on Part 135 flight operations and ensuring the safe integration of new technologies.

As Congress works to improve the pipeline for the next generation of pilots, debate continues on the strong pilot training rules requiring 1,500 hours of flight time mandated after the Colgan crash.

Congress cannot undermine an airline safety rule simply to respond to the market forces of supply and demand.

If there is a pilot shortage, I am interested in the Air Line Pilots Association (ALPA)'s thoughts on ways to address it without sacrificing safety.

Flight attendant fatigue is a pressing aviation safety issue. However, the FAA continues to delay the implementation of mandate requiring at least 10 consecutive hours of rest for flight attendants between duty periods.

I would like to hear more from the Association of Professional Flight Attendants (APFA) about the immediate and long-term impacts of this inaction.

As evidenced by recent events, the FAA's certification process is critical to aviation safety. Professional Aviation Safety Specialists (PASS) can shed more light about the role safety inspectors and engineers in this process and improvements that are necessary to ensure the safety of U.S. aircraft.

Last week, Chair DeFazio, Vice Chair Davids, Congressmen Davis and Ferguson and I introduced the Fair and Open Skies Act, to prevent foreign air carriers from exploiting a "flag of convenience" to avoid the regulations of their home countries, or otherwise undermining labor standards.

I appreciate TWU's, as well as ALPA and APFA's, support of this bill and the Committee will hear more about the importance of maintaining strong labor protections on safety.

The issue of the 737 MAX is not just about stakeholders in the aviation industry.

This Committee is a public body and therefore has a responsibility to hear from those most impacted, which unfortunately includes at times of tragedy.

On today's first panel are Mr. Paul Njoroge and Mr. Michael Stumo, who both lost family in the Ethiopian Airlines flight 302 (ET302) crash, which claimed the lives of 157 people.

Chair DeFazio and I asked Mr. Njoroge to testify today on behalf of the ET302 families and to give a voice to the 157 victims of that tragic accident.

Mr. Njoroge and Mr. Stumo, I cannot begin to imagine the immeasurable grief you and your families are experiencing.

On behalf of the entire Subcommittee, for Members here today and those who cannot join us, I extend our sincerest condolences to you and your family during this difficult time.

We appreciate your willingness to join our discussion on this important issue.

Your testimony is a crucial reminder of the international role the U.S. aviation system operates within.

The crashes occurred on U.S.-made, assembled and regulated airplanes.

The FAA's actions and this Committee's efforts have implications for travel around the world.

A majority of victims of the ET302 and Lion Air JT610 crashes were not Americans, and therefore it is only right to hear from someone who can represent the global community impacted by these tragedies.

Thank you for your advocacy.

As always, this Subcommittee's top priority is safety.

It is our job to provide the resources and oversight necessary to ensure the safety of the U.S. aviation system.

Again, thank you again to today's witnesses and I look forward to your insights.

Mr. GRAVES OF LOUISIANA. Thank you, Mr. Chairman, and thank you for holding this hearing today.

First, and most importantly, I want to express my condolences, and I think on behalf of everyone here, for the loss that you have experienced. And I appreciate the time and dedication that you have committed yourself to, to ensuring that every single lesson learned from this can be extracted, and, most importantly, that no one ever has to go through this again.

You know, there are some amazing statistics about aviation travel. We can sit here and talk about how since 2000, I think it was—no, excuse me—since 1997—since 1997 there has been a 95-percent reduction in aviation accidents. And you can look at the World Health Organization statistics talking about how there are 1.35 million deaths and up to 50 million injuries due annually to road crashes. In comparison, there was 1 death for every 3 million flights in aviation.

And so we could sit back and say, look, these statistics are great, things are going well. But that is absolutely, absolutely not appropriate. And we are going to continue to ensure that we learn every single thing that we can, because the hundreds, over 300 lives that were lost and the experience that you all are going through is completely unimaginable to me.

We met last night and I made a commitment to you that the process that was used to certify this aircraft will not in any way be used to unground these aircraft.

And I look forward to hearing from you. I know that you all have committed an extraordinary amount of time to ensuring that every single thing that we can learn from this, every single step in this process, can be thoroughly examined to ensure that as we move for-

ward, that no other family has to go through this again. And I just want to reiterate the commitment that we made.

We are going to take every lesson learned, no matter how painful, no matter the change that it requires, and ensure that appropriate solutions are put in place, not just for this aircraft but for all aircraft moving forward, and ensuring that these lessons learned are shared with the international community.

I know we have a number of stakeholders that are here today, pilots, we have some of the service technicians, we have the flight attendants and others that are represented, a lot of other stakeholders that I think have important perspective.

But I want to thank you very much for being here today. Your all's strength and power has been absolutely amazing through this.

And, Tor, thank you for being here as well. It was great to meet with you last night.

And I look forward to hearing from your testimony in the second panel as well.

[Mr. Graves of Louisiana's prepared statement follows:]

Prepared Statement of Hon. Garret Graves, a Representative in Congress from the State of Louisiana, and Ranking Member, Subcommittee on Aviation

Thank you, Mr. Chairman, for calling today's hearing.

I want to express my condolences, on behalf of everyone here today, to the witnesses, families, and friends of those lost in the two Boeing 737 MAX accidents. We appreciate your time and dedication in working to ensure no one else ever has to go through the unimaginable experience you are enduring.

We are all aware of how safe aviation is—in general. For example, according to the World Health Organization, worldwide there are 1.35 million deaths and up to 50 million injuries annually due to road crashes. In comparison, worldwide there was one fatality for every three million commercial passenger flights in 2018.

And we could sit here all day and talk about statistics, but that absolutely is not appropriate today, and that's not why we are here. Our witnesses today didn't lose statistics.

I maintain my promise to those here today and others, we will leave no stone unturned in the process for safely ungrounding these aircraft and ensuring this doesn't happen again.

We need to learn every lesson possible from these accidents and put in place any solutions necessary, not just for this aircraft, but for the aviation system as a whole. Despite the progress we have made in safety, we can never stop striving for safer skies in the United States and around the world.

Thank you again, Mr. Chairman, for holding today's hearing.

Mr. LARSEN. Thank you, Representative Graves.

The Chair recognizes the chairman of the full committee, Mr. DeFazio.

Mr. DEFAZIO. Thanks, Mr. Chairman.

And again, thanks, to the families who are here today for having the bravery to testify and to persevere as we move forward.

We lost 346 lives in 2 flights in 5 months, and that is why it is so fitting that you are here today to represent those lives, those families.

You know, I have been on this subcommittee a long time. And back when I was first on the subcommittee, we had what we called the tombstone mentality at the FAA. Too often we were chasing after an accident to figure out what steps should have been taken, what maintenance should have been required, what went wrong.

And I tried for a number of years to say, you have got this archaic mandate from the thirties that was moved over from the Civil Aeronautics Board to the FAA, that you both promote and regulate the industry. That was when it was a nascent industry. It is a mature industry, I would say, and I think that there is a conflict. And I was told, no, there is no conflict, no conflict.

And then I had—we were doing an FAA bill, and actually I offered an amendment to strip the promotional authority. I lost here in the committee. It was not in the Senate bill either. But then ValuJet went down, and suddenly it was, hmm, there are some problems here with oversight, maintenance, sub-subcontracting, all these things.

And I got a phone call—I was a pretty junior Member—saying, you know that amendment you offered?

Yeah, I said, the one that was rejected.

Well, where would we put it in the bill?

And I got about 90 percent of what I wanted in that bill to strip FAA of its promotional duties and focus them on what they are supposed to be doing, is keeping people safe.

And it took a number of years, really, for that to—you know, there is like the agency—you know, it has memories, and there were people there. It took a while. But we had been doing pretty well.

And then along comes ODA. And when it was first offered, I said, I don't understand how this is going to work, and what are the firewalls between the Boeing person who works for Boeing and the Boeing person who works supposedly in the public interest for the FAA?

I voted against it when it first went forward, but then when we got around to reauthorization, it seemed like it was working pretty well. We knew we didn't have enough FAA inspectors to do proper oversight. We raised concerns about that during the reauthorization.

But now we see that there are very, very significant questions being raised in this matter. The committee is involved in a very in-depth investigation, in addition to other investigations, and the Justice Department and inspector general and others are undertaking into how this all happened.

And we will be hearing from Boeing in the future when we finish going—we have received a trove of documents, and we are poring through them. So that is a work in progress.

But we are here today to talk about some concerns that are ongoing and hear from the families.

There are a few other things in that bill that the FAA has stonewalled. Flight attendant rest, fought for that for years. Mike Capuano did a great job, got it in the bill. We held it, against the wishes of some of the airlines and those in the Senate, and we persevered.

But now the FAA is slow-walking that, saying, well, gee, we can't do that until 2020. I understand one of the airlines is pushing really, really hard to not allow flight attendants to get proper rest.

Secondary barriers, we got that in. We know now, which I guess a lot of us hadn't thought about, that you hardly ever have a new type. I mean, there is a 50-year-old plane, and it is still the same

type. And the industry tried to say, we will only have secondary barriers in new types of planes.

You know, I fly a lot, and the flight attendant behind the food cart with their arms crossed is not much of an obstacle to getting into the flight deck.

So, again, we are pushing hard to make certain that the FAA goes forward.

There are others that weren't properly addressed. Lithium batteries. We have already lost two freighters to lithium battery fires.

Foreign repair stations, been raising that issue for a couple of decades now. They are not properly overseen by the FAA. Some problems with the State Department, other issues. They don't have drug testing, they don't have alcohol testing, they don't have background checks.

And then finally, of course, the stupid Government shutdown and all the damage that caused at the FAA, the disruption it caused at the FAA. And we had legislation that would rectify that to draw on the Airport and Airway Trust Fund, which has more than $7 billion in it, and not have more dumb shutdowns of the FAA.

So there is still work to be done, and this committee will leave no stone unturned as we go forward to make things better and safer in the future.

Thank you, Mr. Chairman.

[Mr. DeFazio's prepared statement follows:]

Prepared Statement of Hon. Peter A. DeFazio, a Representative in Congress from the State of Oregon, and Chair, Committee on Transportation and Infrastructure

Thank you, Chair Larsen, for calling today's hearing on aviation safety.

Ensuring the safety of our nation's transportation systems is the most important job of this Committee, and today we will hear about many areas in which safety needs to be improved.

Although fatal commercial aviation accidents in the United States have fallen by 95 percent since 1997, we must do better. In the span of five months, 346 lives were tragically lost abroad in the Lion Air Flight 610 and Ethiopian Airlines Flight 302 accidents, both involving U.S.-manufactured aircraft. That is why it is fitting that we will begin today's hearing with testimony offered on behalf of the families of those whose lives were lost on Ethiopian Airlines flight 302.

To that end, I would like to welcome Mr. Paul Njoroge and Mr. Michael Stumo.

It is important this Committee and the public hear from those whose lives have been forever altered by these accidents. I know that Chair Larsen will introduce you both in just a moment, but I wanted to express my heartfelt condolences for your loss. Thank you for being here on behalf of the families of those who died on Ethiopian Airlines flight 302. I sincerely admire your bravery and appreciate your advocacy before Congress.

Please know that for decades I have been a staunch safety advocate, and have time and time again opposed the "tombstone mentality" in transportation. Meaning, we cannot afford to wait for accidents to occur to make travel and our transportation system safer, across all modes.

As Chairman, I will always remain vigilant and make certain the Committee conducts vigorous oversight of the Federal Aviation Administration (FAA) and the aviation industry, and is prepared to respond when needed to protect the safety of our airspace, its users, and those on the ground. And our work extends across borders; we must ensure the safety and integrity of products designed and made in the United States to be shared with those around the world.

So as the investigations into the probable cause or causes of the Ethiopian Airlines flight 302 and Lion Air flight 610 accidents continue, and this Committee continues examining the role of the FAA's oversight, certification, and delegation processes in these events, we cannot and must not stop there.

Twenty-three years ago *today* I (along with Congressman Lipinski's father) introduced a bill that would strip the FAA's authority to "promote" the industry. It is also 23 years ago to the day that TWA flight 800 crashed into the Atlantic killing all 230 crew and passengers onboard.

I said then, and I will say it now, that the FAA's primary mission must be to ensure the safety of aviation—our skies, planes, crews and the flying public. My bill became law, but it unfortunately took a tragic accident and loss of lives. I think it is worth noting that this is something that the Committee is investigating now. As a critical safety regulator, the FAA must not promote the industry it oversees, but the recent events into the fatal MAX accidents on U.S.-certified aircraft call this into question: is FAA still playing a role to "promote"?

This Committee is committed to ensuring the highest level of aviation safety and will strive for *zero* deaths in air transportation. We must continuously explore ways to identify and address other safety challenges facing our aviation system.

To this end, just last year, we were able to enact the longest FAA reauthorization in decades that included dozens of provisions that will enhance aviation safety. We will have an opportunity today to hear from some stakeholders on what progress has been made—and where the FAA is falling short in meeting its statutory mandates.

Some of these key safety provisions include a mandate that flight attendants receive a minimum of 10 hours of rest between duty periods and a requirement that the FAA review its cabin evacuation assumptions to ensure safe evacuation during an emergency.

Flight attendant rest: While pilots for U.S. commercial airlines must be provided a rest period of at least 10 consecutive hours preceding a flight duty period, the same is not true for flight attendants, despite their important safety duties.

The law requires the FAA to close this gap, ensuring flight attendant rest is on par with commercial airline pilots. However, the FAA has not yet implemented this mandate and doesn't plan to take action until the spring of 2020 despite being directed to implement the provision more than eight months ago. While the FAA is not here to defend its delays today, we will bring the agency up very soon. As Chairman of this Committee, I will not sit by idly and watch the FAA fail to act.

Secondary barriers: Another key provision requires all newly manufactured aircraft to have a secondary cockpit barrier. I am pleased to hear that the FAA is interpreting this provision as Congress intended—in that it applies to *every* new plane rolling off the assembly line, and not just newly type-certificated aircraft as some in industry have proffered. We have learned during our investigation into the 737 MAX that seldom is a transport category aircraft given a new type-certificate. So it would not make sense to have this critical safety and security provision tied only to a new plane certified a decade from now. It must be apply to every plane that is manufactured. And while the FAA agrees with this interpretation, I am concerned that the agency is slow-walking this mandate.

Our work does not stop here. There were many critical issues—for which I have been advocating for years—that were not included or adequately addressed in last year's law, such as the risks posed by lithium batteries.

Lithium batteries: Current law foolishly prohibits the FAA from imposing regulations greater than the lowest common denominator of international guidelines unless there has been an accident. This is the perfect example of the "tombstone mentality" that we should not tolerate.

If ignited, just eight lithium batteries at half-charge can bring down an airplane, according to the FAA's own testing. In fact, I went up to the FAA Technical Center in New Jersey with the Committee earlier this year and saw first-hand what these batteries can do. You don't need 800 pounds of lithium batteries to bring down a plane. You just need eight. I will not give up this fight until this prohibition is repealed.

Foreign repair stations: In addition, I have been concerned for years over the FAA's lax oversight over overseas aircraft repair stations. Report after report from the Department of Transportation Inspector General has detailed deficiencies in FAA oversight and monitoring of foreign repair stations that continually perform more and more critical safety work on U.S.-registered aircraft.

Congress included in the 2012 and 2016 reauthorization laws requirements that the FAA issue rules requiring safety-sensitive workers at foreign repair stations be subject to alcohol and substance abuse screening and background investigations, just as workers at U.S. facilities are. However, to date, the FAA has failed to implement these important mandates. We will continue to explore ways to ensure parity between U.S. and foreign entities, which will enhance the overall safety of our system.

Shutdown bill: I would also like to take this opportunity to talk about legislation that Chairman Larsen and I introduced earlier this year, H.R. 1108, the "Aviation Funding Stability Act of 2019." This bill would ensure all FAA programs function uninterrupted and that all FAA employees remain at work and paid during any future lapse in appropriations.

Our aviation system is the largest, busiest, and safest system in the world. I can say, without a doubt, that our system was weakened each day the FAA was shut down earlier this year—the safety; the security; and the overall health of U.S. aviation was put at risk. And unfortunately, the effects of the shutdown—the longest in U.S. history—will be felt for years to come.

The FAA plays too critical of a role in ensuring the safety of the traveling public to be shut down again, and it is our responsibility to make sure that nothing stalls the FAA's safety efforts, particularly the failure of Congress to do its job.

I will conclude by saying that there is nothing that this Committee does that is more important than its safety work. I look forward to hearing from the witnesses. Thank you and I yield back.

Mr. LARSEN. Thank you.

The Chair recognizes the ranking member of the full committee, Mr. Graves of Missouri.

Mr. GRAVES OF MISSOURI. Thank you, Mr. Chairman, for calling the hearing.

I want to join my colleagues in expressing my sincere condolences to the family and to the friends of the victims of both Lion Air flight 610 and Ethiopian Airlines flight 302.

You know, none of us can truly understand the pain and sorrow that they are going through. And we thank you for being here today to share your perspective with the subcommittee as we continue to review the impacts of these two terrible tragedies.

There is no doubt in my mind that all of us share the common goal of seeking the safest aviation system and striving to improve it here in the United States, and all over the world, for that matter. And our efforts in this regard, they have to be constant, they have to be consistent, and they have to be constructive. This means mitigating risks and developing contingencies in all of the areas.

And to this end, I am pleased that we will also hear today from the NTSB as well as labor organizations. These unions represent the men and women who are operating, maintaining, and servicing U.S. airlines, as well as those regulating and inspecting U.S. airlines and manufacturers every single day. Their views are going to assist us in our understanding of the state of aviation safety in the United States and abroad.

And I also look forward to testimony from the many other aviation stakeholders and from the Federal Aviation Administration directly on the state of aviation safety that is coming up at a future hearing.

Again, I want to thank the family members for being here and express my condolences.

And with that, I yield back.

[Mr. Graves of Missouri's prepared statement follows:]

Prepared Statement of Hon. Sam Graves, a Representative in Congress from the State of Missouri, and Ranking Member, Committee on Transportation and Infrastructure

Thank you, Mr. Chairman, for calling today's hearing.

I want to join my colleagues in expressing my sincere condolences to the families and friends of the victims of both Lion Air flight 610 and Ethiopian Airlines flight

302. None of us can truly understand the pain and sorrow you are enduring. We thank you for being here today to share your perspective with the Subcommittee as we continue to review the impacts of these two terrible tragedies.

There is no doubt in my mind that all of us share the common goal of seeking the safest aviation system and striving to improve it here in the United States and around the world. Our efforts in this regard must be constant, consistent, and constructive.

This means mitigating risks and developing contingencies in all areas. To this end, I am pleased that we will also hear from the National Transportation Safety Board as well as labor organizations. These unions represent the men and women operating, maintaining, and servicing U.S. airlines, as well as those regulating and inspecting U.S. airlines and manufacturers every day. Their views will assist our understanding of the state of aviation safety in the U.S. and abroad.

I also look forward to testimony from the many other aviation stakeholders and from the Federal Aviation Administration directly on the state of aviation safety at a future hearing.

I again want to thank the family members for being here and express my condolences.

Mr. LARSEN. Thank you.

We will now move to testimony.

Just for the committee members, Mr. Njoroge will be testifying, and Mr. Stumo will be here in support and may be available to answer questions as well. Mr. Njoroge will be testifying.

Just since this is your kind of first time—first time for everybody—be sure you are up to the microphone, that it is turned on. And if it is pointed at your chin, it is probably better for the sound.

And then as well, although we tend to limit to 5 minutes, in agreement with talking to Mr. Njoroge, if he is going to go over 5, we are not going to hold him to a fast 5 on this.

So we will let you testify until you are done and then move to questions.

Mr. Njoroge, you are recognized.

TESTIMONY OF PAUL NJOROGE, ON BEHALF OF THE FAMILIES OF ETHIOPIAN AIRLINES FLIGHT 302, HUSBAND OF CAROLYNE KARANJA, FATHER OF RYAN NJUGUNA, KELLI PAULS, RUBI PAULS, AND SON-IN-LAW OF ANN KARANJA, VICTIMS OF FLIGHT ET302, ACCOMPANIED BY MICHAEL STUMO, FATHER OF SAMYA STUMO, VICTIM OF FLIGHT ET302

Mr. NJOROGE. Thank you, Chairmen Larsen and DeFazio and Ranking Members Graves and Graves, for allowing me to testify today.

The Boeing 737 MAX crashes killed my wife, my three children, my mom-in-law, and 341 others. Today I speak not only with my voice, but the voices of my departed family, my mom-in-law, and the other 341 victims.

My wife Carol was a dedicated homemaker and a full-time accountant who wanted to change the world through God's Child education in marginalized communities of Kenya.

My 6-year-old son Ryan was a super intelligent boy who was fascinated by the galaxy and aspired to be an astronaut.

My 4-year-old daughter Kelli's singing delighted everyone.

My 9-month-old daughter Rubi was bubbly and a joy in our family.

And my mom-in-law Ann was a retired teacher who for over 40 years who has shaped the world of young men and women through her teaching and counseling.

I think about their last 6 minutes a lot. My wife and my mom-in-law knew they were going to die. They had to somehow comfort the children during those final moments, knowing they were all their last. I wish I was there with them.

It never leaves me that my family's flesh is there in Ethiopia mixed with the soil, jet fuel, and pieces of the aircraft.

In Canada, Independence Day was celebrated on July 1. I stayed buried in my little house in my grief, hearing the sounds of celebration and fireworks in the sky, but all I could think about was the 737 MAX struggling to gain height and eventually diving to the ground, killing my whole family and 152 others.

If my wife, my children, and my mom-in-law were alive, they would have enjoyed all family activities on Canada Day. Every minute of every day, they would be all around me full of life and health. I miss them every minute of every day.

On April 4, 3 weeks after the deaths of my family in what I have since learned is a shameful pattern of behavior by Boeing and airplane manufacturers, Boeing shifted focus from the root cause of the crashes, which is the design flaws in the 737 MAX and MCAS, and started talking about foreign pilot error. This distracted from correcting the real causes of the crashes and is an insult to humanity.

Boeing and their apologists want to shift scrutiny from their single-minded quest for short-time profits over safety and place it on foreign pilots who, like domestic American pilots, were left in the dark by Boeing.

Would they have used the term "domestic pilot error" if the crash happened in the United States? The term "foreign pilot error" is utter prejudice and a disrespect to pilots and Boeing customers across the world.

Boeing used this fallacy of foreign pilot error to avoid the grounding of the 737 MAX after the crash of Lion Air flight 610 on October 29 last year. That decision killed my family and 152 others in the crash of Ethiopian Airlines flight 302 4 months later.

The FAA should have known that the failure to have triple redundancy in critical safety systems could cause crashes and death. They recklessly left Boeing to police itself.

The families demand that the 737 MAX8 be fully recertified as a new plane because it is too different from the original certified plane. We demand that simulator training be required. Recertification must take place in combination with a full legislative fix for the aviation safety system.

The FAA clearly needs a budget sufficient to fulfill safety obligations. The U.S. Senate should only confirm a new FAA Administrator if that person agrees to safety reforms.

Boeing should not be allowed to act like a mere investment company extracting wealth to supercharge their holder returns at the expenses of safety and quality. Their leadership should change in favor of engineering safety focus.

Other safety critical industries have early warning system data collection with immediate responsiveness. The FAA and aviation industry need to have such systems in place.

If Boeing's wrongful conduct continues, another plane will dive to the ground killing me, you, all your children, all the other members of your family. It is you who must be the leaders in this fight for aviation safety in the world.

Now, future hearings of this committee should include those who wrote the MCAS software, technical dissenters, whistleblowers, safety engineers, and families. You hear multiple testimony from pilots and unions. We, the victims' families, need to continue to be included in these hearings.

Thank you for allowing me to speak today.

[Mr. Njoroge's prepared statement follows:]

Prepared Statement of Paul Njoroge, on behalf of the families of Ethiopian Airlines flight 302, husband of Carolyne Karanja, father of Ryan Njuguna, Kelli Pauls, Rubi Pauls, and son-in-law of Ann Karanja, victims of flight ET302

Thank you Chairman Larsen and Chairman DeFazio, and thank you Ranking Members Sam Graves and Garret Graves, and all Distinguished Members of this Committee for allowing me to testify before you today.

My name is Paul Njoroge and I come before you with a broken heart. It is not something that this Committee or that Congress can fix, but I push myself every day to try to do something in the memory of my family, my entire family that was killed in the second Boeing crash in Ethiopia. My wife, Carolyne, a wonderful mother to our children, and who we talked about getting old together. Our three children, Ryan, six years old with the whole world ahead of him as he dreamed of being an astronaut one day. Kelli, just four years old, and the light of everyone's eye. And little nine-month-old Rubi, a baby who sat on her mommy's lap who I wish I could hold just one more time. I have nightmares about how they must have clung to their mother, crying, seeing the fright in her eyes as they sat there helplessly. And there was nothing I could do to save them. My mom in law sat beside them with tickets I had purchased for them that was to be a trip of a lifetime. I paid for plane tickets that was to be a safe flight. I did not know all of the information of which Boeing knew about how dangerous that plane was yet the corporation allowed 157 people to board that dangerous plane that could not land safely. I never knew it would be the last time I would ever see them.

I miss their laughter, their playfulness, their touch. I am empty. I feel that I should have been on that plane with them. My life has no meaning. It is difficult for me to think of anything else but the horror they must have felt. I cannot get it out of my mind.

But I speak for more than myself who are trying to cope with this insufferable loss. I speak for all of the families who lost loved ones whom they will never see again and who were tragically torn from their lives because of reckless conduct on the part of so many, particularly Boeing, a company who became steadfast in its single-minded quest to place blame on so-called "foreign pilots." Since the first Max8 crash in October, Boeing began a pattern of behavior blaming innocent pilots who had no knowledge and were given no information of the new and flawed MCAS system that could overpower pilots. No manual, no training, no information was provided to pilots on how that new MCAS system worked, yet they were put in those cockpits and expected to know what to do. Instead of accepting responsibility and informing pilots around the word, Boeing continued its blame game on pilots, to shift focus from its own responsibilities until the second plane crashed. Then the world turned its focus on those who were really culpable. It could no longer be denied by Boeing.

Little did passengers around the world know of the close relationship that Boeing had with the FAA. So close that apparently the FAA was allowing Boeing to certify planes, like the Max8, for flying without supervising those doing the certification. The FAA should have known that the failure to have triple redundancy in critical safety systems could cause crashes and death. This has to become part of an improved FAA, checking safety and certification requirements. No excuses can replace

this necessity. The FAA allowed a flawed software package to rely upon data from a single angle of attack sensor. These sensors have a relatively high rate of error, a rate that normally would require at least two levels of redundancy. Not only was this redundancy mandate not followed, the FAA and Boeing did not simulate sensor failures when testing the 737 MAX8.

The families demand that the 737 Max8 be fully recertified as a new plane because it is too different from the original plane designed at the beginning of the Vietnam War. The FAA's practice of grandfathering old designs and granting waivers on new designs has significant human costs. Boeing persuaded the FAA to certify the Boeing 737 MAX8 as a 737, a plane designed in 1966. The 737 has a low fuselage compared to modern planes. The low fuselage is a relic from more than 50 years ago when staircases to the tarmac were the method of getting passengers on and off planes. Boeing wanted to incorporate bigger and more fuel-efficient engines to compete with Airbus. But it also wanted to minimize its certification and training costs. The problem with these new engines was that they could not fit under the 737's wings. Rather than scrapping the 1960's design in favor of a modern design, Boeing fit the engines onto the old fuselage by moving them up and forward. This caused the plane to be prone to handle differently than the older 737s and nose up in unfamiliar ways. Boeing's response was the now-infamous MCAS software to take control of the plane in ways the pilot would not detect.

We demand that the FAA require simulator training, as do airline passenger groups, and the famous pilot, Captain Chesley "Sully" Sullenberger. After the two crashes, the FAA surprisingly proposed only requiring an hour-long iPad tutorial for cost reasons and the simple fact that only two 737 MAX simulators exist in North America, Boeing and the FAA are resisting this basic requirement that could have prevented these two crashes. The lack of foresight and greed behind this inadequate training hurts the core of my very being. I will never understand how any person, how any corporation, can be so selfish and so sightless in its duty to allow passengers to travel safely from one place to another.

As an investment professional, allow me to inform Congress as to how Boeing has viewed this whole crisis—only through the lens of its stock price and the security of their executives' jobs. By focusing only on cutting costs and spending profits to pump up the stock price, rather than reinvesting in safety, Boeing's CEO has managed to steer the company's stock (NYSE:BA) from a price of $140 on July 1, 2015 to last week closing price of $365. Some investors and traders might have even banked higher profits when the price reached $446 some days before the second March 10 crash of its Boeing 737 Max8 in Ethiopia.

But, let me give my thoughts about how the stock price has moved exponentially since late 2016. Although the first 737 MAX planes were delivered in May 2017, by the end of 2012, the company had received 2,500 orders for these planes. This translated to expected revenues totaling to $140 billion. Boeing's executives at the time started employing an aggressive equity-repurchase program; $2.8 billion in 2013 and $6.0 billion in 2014. And when Boeing's current CEO took over in 2015, the stock-repurchase dollar values started to swell even further—$6.8 billion in 2015, $7.0 billion in 2016, $9.2 billion in 2017, and $9.0 billion in 2018. And in December 2018, barely two months after the crash of the Boeing 737 Max8 in the Java Sea., the board authorized repurchase of NYSE:BA stock worth $20 billion in 2019. By March 10, $2.3 billion worth of stock had been repurchased. And after the 737 MAX was grounded, on April 24, 2019, Boeing's CEO and his executive team realized that the company's revenues were at risk, and so they suspended the stock repurchase program.

Boeing increased dividends by 10.2 percent in Q1 2013, 50.5 percent in Q1 2014, 24.7 percent in Q1 2015, 19.8 percent in Q1 2016, 30.3 percent in Q1 2017, 20.4 percent in Q1 2018 and 20.2 percent in Q1 2019. Over the last six years, Boeing has revised the revenues and earnings guidance a number of times; all these based on the expected and realized revenues from the sale of the poorly designed 737 MAX plans. All these actions; the aggressive share-repurchase program, the dividends increase, the revisions of revenues and earnings guidance, had an enormous signaling effect to investors. The Boeing executive team knew that such actions would cause excitement on Wall Street, and continually increase the company's stock price. Boeing acted as a financial company rather than a provider of safe and innovative airplanes. Management cut safety engineers, captured the FAA, outsourced aggressively to foreign countries, and avoided recertification of the 737 MAX as a new plane.

I know that CEO Dennis Muilenberg and Boeing's executive team have been the primary beneficiaries of this strategy to extract wealth from this storied company. They have benefited from the stock-based compensations. They also have benefited from bonuses based on company performance; with this performance significantly

being boosted by the revenues from the sale of the 737 MAX planes. Could that be the reason Boeing did not feel obliged to ground the MAX even after the second crash of the Boeing 737 Max8? Do Boeing executives now understand why I and many others across the world have said that the entire Boeing team focused on profits, stock price and overall company financial performance at the expense of the safety of human life? Did the lure of numbers make Boeing lose sight of its fundamental responsibility, which is to ensure that all of its planes are safe to fly? Back to my very essential question; why wasn't the Max8 grounded in November after the first crash in the Java Sea? One hundred and eight nine lives were lost, and executives at Boeing cared more about its stock price than from such a tragedy occurring again.

I and other families want any recertification to take place only after all investigations are completed. Any future ungrounding must not precede a full legislative fix of the FAA and the aviation safety system. Indeed the FAA should be taking the lead to fix its captured status. Recertifying the MAX without a legislative fix would represent Congress' and the FAA's endorsement of the system as is. Congress cannot continue allowing Boeing to unduly influence the FAA, avoiding safety engineering oversight and cutting corners.

FAA has jeopardized its standing as the global leader in aviation safety. Boeing has surrendered its top spot in global commercial airplane manufacturing to Airbus. How else can the FAA and Boeing regain its status in the world of aviation unless it has guaranteed a full investigation and a full fix of these issues?

The Congress should require that the FAA return to the Designate Engineering Representative (DER) which existed before the supervision-free delegation of the Organization Designation Authorization (ODA) system was implemented in 2005. The DER system allowed the safety culture of aviation engineering be supervised by and to report problems directly to FAA, without being silenced or intimidated by company managers and their timeline and financial pressures. While the Acting FAA Administrator estimated that eliminating the entire Organization Designation Authorization system would cost the FAA $1.8 billion and would require 10,000 more employees, but that cost estimate is not relevant to returning to the DER system. But if an even more substantial FAA overhaul costed $1.8 billion per year, with over 950 million flights per year in the United States alone, that cost represents less than $2 per flight. My point is that fundamental safety improvements are affordable and well within our reach.

The U.S. Senate should only confirm a new FAA Administrator if the nominee agrees to safety reforms. Any nominee for FAA Administrator who does not unequivocally agree to safety reforms at the FAA is not qualified to serve as the leader of this critical organization. The FAA surrenders too much of its authority to Boeing, and if Congress decides to endorse the FAA's status quo, Congress would be surrendering its authority to Boeing as well. The problems are known. Congress cannot punt on this issue any longer. The credibility of the US aviation system, and perhaps Boeing itself, cannot survive a third crash.

FAA should establish an effective system requiring manufacturers, airlines, pilots and others in the industry to report potential safety problems or defects as an "early warning system." Other safety critical industries have early warning system data collection with immediate responsiveness, so those industries can prevent deaths rather than respond to them. In 2002, Congress required the National Highway Traffic Safety Administration to enact early warning procedures. Motor vehicle manufacturers and equipment manufacturers are required to report information that will help NHTSA identify defects related to motor vehicle safety. The FAA and aviation industry need to mandate such systems in place.

As the Boeing CEO and other senior executives certainly enjoyed their July 4th holiday watching fireworks in the skies with their families. All I could think of in Canada on July 1, a day celebrated much like July 4th in America, was of the deadly skies of Bishoftu, Ethiopia, of a 737 Boeing Max plane repeatedly taking control from the pilots to push the nose down and eventually crashing into the ground at 500 miles an hour. Nothing was left but a crater. I sat huddled in a small apartment, not being able to return to my house ever. I thought of all the celebrations I will be missing with my family. No more birthdays, no more anniversaries, no more holidays, no weddings for my children, no grandchildren. Boeing has never reached out to families about the impossible sorrow and grief we will carry for our entire lives. Instead they have a press relations strategy to apologize to cameras and propose half-baked promises to give $100 million to local governments and nonprofit organizations.

Future hearings of this Committee should include testimony from those who wrote the MCAS software, technical dissenters, whistle blowers, safety engineers and, in every hearing, families who each have their own grief to explain to this Committee.

You hear multiple testimony from pilots, associations, unions, and government agencies. A true investigative hearing would include these persons with direct knowledge who are not presenting oral organizational press releases.

Thank you.

Mr. LARSEN. Thank you, Mr. Njoroge, for your testimony, your moving testimony, and your recommendations.

We are going to now, as we discussed yesterday, we will move to questions. And we will go one at a time, each side. I am not sure if all Members have questions for you, but I will start.

And I know you have come with some recommendations for the committee to consider, and I wanted to ask you specifically about your written testimony and the issue of the changes that we have made about 14 years ago in what we call the ODA, in the Organization Designation Authorization. And I wanted to give you a chance to amplify your oral testimony with your written testimony.

Can you explain, at least in your mind, the change that you think the committee ought to be making and why we ought to be making any changes to that authority.

Mr. NJOROGE. Michael, do you want to——

Mr. LARSEN. And it is fine if Michael wants to answer as well, that is fine.

Mr. NJOROGE. Then I will supplement it later.

Mr. LARSEN. That is fine.

Mr. NJOROGE. Thank you.

Mr. STUMO. Thank you, Mr. Chairman.

We, as families, have become not experts, but we do have some opinions. And we are in touch with a lot of the families from both crashes all over the world, and we will continue providing input and recommendations. It is not just us, but all the families, because we want to include all of them.

And our understanding at this point—and I have talked to Boeing safety engineers who have been in the system back in the DER program versus—and through the transition to ODA. It was explained to me like this.

There have always been timeline pressures and financial pressures, but under the older DER program, when, of course, Boeing still paid these engineers but they reported to FAA, there were two lines of authority, two chains of command, one up through the FAA side, one through the Boeing side, and the safety culture could put a stop to things if something looked wrong.

After the ODA system—and I am not sure this is entirely clear from the black-and-white text of reading about these systems—after the ODA system there was only one chain of command up through Boeing. It was very difficult for the safety culture to stop something, and that was a big change.

Group think was encouraged. Being creative in fault tree analysis, thinking about what could go wrong and documenting it and preventing against it, you were encouraged not to be terribly creative or you might have to find another—they might encourage you to go find another place to work elsewhere maybe in the company.

So that is our understanding of going back to ODA, is that dual chain of command. There may be others.

Mr. LARSEN. Thank you.

Anything to add, Mr. Njoroge?

Mr. STUMO. Sorry?

Mr. LARSEN. Anything to add, Mr. Njoroge?

Mr. NJOROGE. Well, yeah, essentially what we are saying with the ODA program, it is that Boeing has an oversight of itself.

Mr. LARSEN. Thank you.

I am going to turn to Mr. Graves, recognized for 5 minutes.

Mr. GRAVES OF LOUISIANA. Thank you.

When I gave an opening statement, I talked about statistics. You both being here today and the conversations that we have had make it clear that these aren't statistics, that these are lives, these are family members, and it is something that—it is a message that cannot be overstated to us.

Again, I want to thank you for your strength. I want to thank you for your resilience and your commitment to ensuring that no family has to go through this ever again. And it doesn't matter if we get to 99.9 percent improvements. If there is one life, if there is one injury, we need to keep striving to make sure that we get to perfection.

And I just want to say it again, any process to unground this aircraft, as far as I am concerned, will not be allowed to resemble the process that was allowed for these accidents to occur. In fact, I can't even call them accidents. These disasters.

So thank you very much, both, for being here. And I want to remind you that my door is open, my phone is open at any time, and I look forward to continuing a dialogue with you. But thank you very much for your recommendations.

Mr. NJOROGE. Thank you.

Mr. LARSEN. Thank you.

The Chair recognizes Mr. DeFazio for 5 minutes.

Mr. DEFAZIO. Thank you, Mr. Chairman.

Mr. Njoroge, I read your entire testimony. It is very, very thoughtful, compelling.

And you are an investment professional, and one of your observations is about the pressures from Wall Street, the concerns regarding how executive compensation is determined on stock price and stock buybacks.

Would you like to just comment on that a little bit, since you didn't—you abbreviated your testimony for oral purposes, which we appreciate. But would you like to perhaps elaborate on that a little bit or at least make that point?

Mr. NJOROGE. Sure. Thank you.

Basically, when companies repurchase their own stock, they try to send a message out there to the investors that, we are bullish about our own company, we believe that our financial performance is good.

And it seems that since the CEO, Dennis Muilenburg—obviously, before that, they still had the equity repurchase program going on. But since he took over, the numbers, the dollar values of the repurchase of the stock went up.

And I do believe it is in 2017 when they started selling the 737 MAXes, their revenues swelled, the revenues were growing. And earnings were growing as well. And they decided, while we have a good amount of retained earnings, we can throw the money out there. And the stock price—obviously, when you send those—the

signal, in effect, to the Wall Street, the stock price will keep going, because investors will keep buying the stock.

And the beneficiaries of these are actually the executives, because they benefit from equity compensation; that is, the exercise of stock options.

We also saw them raising their revenues and earnings guidance. And obviously this was based on the expectations of the sale of the 737 MAX. We saw them increase dividends.

You rarely see a company that increases dividends and at the same time continues to repurchase their own stock. When that happens, then the company is so bullish about their own achievements, and they just want the stock to keep going.

Mr. DEFAZIO. Thank you for that.

So the money that they used for repurchasing, it is not constrained in any way, they could spend that money for—on personnel or plant equipment or anything else. Is that correct?

Mr. NJOROGE. Well, yeah. And I really felt that when the board of directors authorized the repurchase of stock, what, $20 billion, that was in December of 2017—December of 2018—that is just a couple of months ago, about 6 months ago, that was barely 2 months after the crash of Lion Air flight 610. So at that point, they knew that there were safety concerns with their jet, and they should have invested on safety instead of repurchasing stock.

Mr. DEFAZIO. Yeah. I recently read—and this is something we are looking into—but a news story where they were laying off senior engineers and hiring contractors, some paid less than $10 an hour, in dispersed locations around the world, which is obviously hard to supervise and integrate in developing software for this airplane.

And that, when you talk about the amount of money that they had on a discretionary basis that they could use for bonuses or dividends or buybacks, it raises some real concerns. So thank you for expanding on that.

I yield back, Mr. Chairman.

Mr. LARSEN. Thank you.

What we have now going forward is a few other Members have some questions for you. And so we are going to go a little out of order in that regard.

Ms. Davids from Kansas, who is the vice chair of the subcommittee.

Ms. DAVIDS. Thank you, Mr. Chairman, and to the ranking member of the committee and the full committee.

First I want to start off by saying thank you to everybody, who I know is in the middle of a grieving process right now, for being here.

This is an intimidating place to be in general, and to take the time to come and force everyone who sits on this committee and all of us who sit in Congress to stop and think about—we hear a lot about the stakeholders in this. Certainly everyone who gets onto a plane is a stakeholder in this.

And so your voice is just as important here as the people who are in the industry, making money, and running businesses. So I appreciate you.

Mr. NJOROGE. Thank you.

Ms. DAVIDS. As someone who is on this committee, I am very committed to a thoughtful review of the entire process that is going on for us to—you know, the responsibility that we have as Members of Congress is not just to legislate, but also to perform oversight functions to keep people safe.

And when I read through your testimony, there are two things I would love to hear. Both of you speak about actually, one, you talked a little bit already about who we should hear from, that the testimony should be from, the engineers and from executives and whistleblowers and everybody.

I would love to hear you talk a little bit more about that in the context of how do we make sure that you have the trust of the industry? Because so much of this is built on trust. And this is where we see a breakdown of that trust?

The fact that you have to talk about earnings and statements and bringing your professional capacity of understanding that stuff into a conversation that really centers on how do we keep people safe is, I think, part of the trust conversation.

And then the other thing, when I read your testimony, the fact that you said that Boeing has never reached out to the families really stuck out to me. And I would like to hear you comment on that publicly, because I think that is really important.

Mr. NJOROGE. Well, I will answer the second question first.

Boeing, they have been in front of cameras acknowledging that there were mistakes in the installation of MCAS. Obviously they don't talk about the flaws in the design of the 737 MAX. And they have apologized to the families in front of cameras.

Now, they know who the next of kin of these victims are, but they have not come to us and they have not apologized in person. Ethiopian Airlines did send letters to us, not to apologize, but to offer their sympathies and their messages of condolence.

So the expectation is—you know, it is hard to trust Boeing with their apologies, given that they have not reached out to us. And I do believe that they did that in the days leading up to the Paris Air Show, because it is for commercial reasons. I believe it is a publicity stunt, that they just appeared on cameras to apologize to the families.

Mr. STUMO. I think the families are in agreement that Boeing's apologies to cameras have not been apologies to the families.

We were in Ethiopia, our family, after the crash, and the Ethiopian Airlines sent letters, they invited us in, they were reaching out directly. And so it was very much warmer.

And the recent offer of $100 million to something seemed like a PR stunt to us. They never reached out to families to discuss what the needs of the families are.

And on the future hearings, the technical dissenters should be heard from, those who dissented from a potential group think force consensus process at FAA, if any. If the committee has identified any, the public should hear them, not just the investigators.

Any whistleblowers who may have been fired and maybe have a gag order pursuant to a settlement, who have complained about safety issues with regard to the 737 MAX should be called to testify with protective subpoenas so the public can hear what they had to say and what their experience is.

And the aviation software writers, do they have the same level of engineering safety culture that regular engineers, aviation safety engineers. We are getting more software in these planes. In this case it took control of the plane and pushed it into the ground.

We need triple redundancy in every part of these systems as they merge with software and hardware. And do software writers really have that kind of culture? We need to hear who wrote that software and what they have to say and what their culture is.

Mr. NJOROGE. And, well, to just reinforce what Michael said, for this committee to have achieved its objective, and that objective is to do a thorough investigation as to what happened within Boeing and the FAA, the weakness in their internal oversight processes that a jet that is flawed was designed, certified, and allowed to fly. Then we need to hear from the technical dissenters, from the whistleblowers, the safety engineers as well.

Ms. DAVIDS. Well, I will just close by saying thank you, again, Mr. Njoroge and Mr. Stumo, for coming here and being the voices that are sharing with the Members of Congress what we need to do to make sure that the trust of the folks who are getting onto planes exists.

Thank you.

Mr. NJOROGE. Thank you.

Mr. LARSEN. Just two more Members, Mr. Lynch and Ms. Craig. So I will call on Mr. Lynch for 5 minutes from Massachusetts.

Mr. LYNCH. Thank you, Mr. Chairman, and thanks for holding this hearing. And I thank the ranking member as well.

Mr. Njoroge, thank you so much for coming here, and Mr. Stumo, for giving voice to your loved ones who cannot speak for themselves.

I also want to thank Ms. Milleron, Nadia, Michael's wife, for spending about an hour with me after the last hearing and talking about her daughter Samya.

I know that Tor and Adnaan are here, Samya's brothers.

And I know that Tomra Vecere is here on behalf of her brother Matt, who also perished.

I want to thank you all for, first of all, being willing to come here and express your grief and trying to hold us all accountable—Boeing, the FAA, and Congress—for our responsibility in this.

I also want to thank you for your courage, in turning your tragedy, your loss, into something that might benefit the general public, by making this real, by putting this on us and holding our feet to the fire to make sure that we take every step possible to correct this situation going forward.

In my earlier conversations with Nadia, Michael—and I know this is something that Mr. Njoroge has raised as well—at our last hearing, we heard from Captain Sullenberger regarding the retraining of pilots during the recertification process and once that certification process begins, if and when this 737 MAX8 is allowed to resume flights.

And there is a controversy or some difference of opinion of whether the training for those pilots—or retraining for those pilots—should be conducted by simulator or—which is what Captain Sullenberger recommended—or whether it should be allowed to occur by computer, a simple computer program.

And I know that Nadia had some strong opinion on it. I think there is a need to make sure we get this right. And I am not sure—I know that inadvertently, you have delved into some of the issues. I see some of the recommendations that you have made here in your opening testimony.

What are your thoughts on the requirement that we make sure that, in light of the fact that we had reports that the aircraft was acting like a bucking bronco, how important do you think it is that we give each and every pilot the full knowledge and experience on a simulator versus allowing them to be retrained on a computer, if you will?

Mr. NJOROGE. Well, first of all, Boeing should never be allowed to conceal information from the aviation industry, from the pilots and the public, because they did that with MCAS.

Eight days after the crash of Lion Air flight 610, they issued a flight operations manual bulletin. And even after, knowing that 189 people died, they did not mention MCAS, they did not want to mention the software.

And that means they were just trying to conceal the information, because when you talk of MCAS, then you talk of the design flaws in the 737 MAX.

And a lot of times in our lives, we tend to rely on experiences of other people. And when Captain Sullenberger spoke, he said that even knowing that—even—he knew that what—he knew what would happen. And so when he was trying to do the simulator thing, he got to understand why the pilots could not control that aircraft. And that means that just that iPad training is not enough at all.

And so what I would like—my recommendation is that the pilots should go through a simulator training, and the flights operations manual should always disclose everything that is in an aircraft.

And that should never happen again. I mean, that is criminal. Why would you conceal information of an important software that can take control of the plane? And that is what happened, MCAS took control of that plane, the pilots could not recover it, and it just dived to the ground.

So that is something that this committee should look into.

Mr. LYNCH. Michael.

Mr. STUMO. Thank you for the question.

You know, this plane, we definitely want simulator training, as families. My wife and I came to Washington after Samya's death far earlier than we would ever want to, because we heard that the Flight Standardization Board was proposing another hour of computer or iPad training as the remedy for pilot training after our daughter died. And we were very unhappy and worried that there was going to be a rush to unground this plane. Plus the comment period, instead of 30 days, was 14 days.

And so we got involved then, even though we weren't ready to do so. And we had a meeting with FAA early, and we got families to sign a letter requesting that that comment period be extended so that we could comment and say this is insufficient, we need simulator training. And the FAA was gracious enough to grant that extension of time to comment. And we did, and other members of the public submitted comments that simulator training is needed.

And as Captain Sullenberger said, when you have an undisclosed, or at the very most, partially disclosed, software system that can take control from the pilots and cause startling things to happen in the cockpit, the simulator didn't make sense to me. What he said, that doing the simulator training is far better than one of many checklists; you have to get it into your muscle memory when those startling things happen, and you don't have much time to react.

Mr. LYNCH. Thank you.

I thank the chairman for his indulgence, and I yield back.

Mr. LARSEN. Thank you.

We have one more Member. It is Ms. Craig from Minnesota. And after she is done, we are just going to do a 5-minute transition to the next panel.

So Representative Craig from Minnesota, 5 minutes.

Ms. CRAIG. Thank you so much, Mr. Chairman.

Mr. Stumo and Nadia, it is great to see you here again. Thank you for giving me time to speak with you and to talk about how we honor your daughter Samya's memory with action, because that is what we need to do.

Mr. Njoroge, I can't imagine the pain that you are enduring with the loss of your wife and your children. But thank you for finding the strength to testify here today.

I want to continue focusing on what more we can do to develop those robust post-market—after these planes are out and they are bucking like broncos, as my colleague said, what more we can do to make sure that we have a robust system for identifying these red flags before crashes occur.

I keep wondering how an industry fundamentally rooted in safety can lack robust mandatory reporting requirements by manufacturers, pilots, mechanics, et cetera.

In the last hearing, I asked about the Aviation Safety Action Program and the Flight Operations Quality Assurance and whether these operational reporting schemes were catching the mechanical malfunctions or red flags in this country.

I also have wondered how Boeing could not be required by law to compile and publish near-miss malfunctions. It is hard to believe that not a single pilot anywhere in the world went head to head with this malfunctioning MCAS system, overcame the software, landed with information about that experience, and that the public did not know that.

I worked for a company that produced pacemakers, before I came here, that control irregular heart palpitations, machines that by design are there to save lives. Yet we had those kind of robust reporting requirements. Why don't the airlines and manufacturers?

Mr. Njoroge and Mr. Stumo, you testified in support of the FAA creating a system that would require manufacturers, airlines, pilots, and others to develop this kind of early warning system.

The industry, though, has advocated in favor of the Aviation Safety Action Program and the Flight Operations Quality Assurance Reporting Systems.

Do you think these are currently enough? And what other changes do you think the FAA must incorporate for all parties to

be held accountable for putting safety first and make sure adverse events don't go unreported or unnoticed?

Mr. STUMO. Thank you for that question.

We, as the families, at least my family and others we have talked to, do think that a more robust early warning system is necessary, rather than to state, oh, it has been a long time since there has been a crash, that is really good. But if you have a 99.9-percent safety record, that is 1 crash every 1,000 flights, which we don't have. But that is not good enough.

And I know that in other critical safety industries—or I have heard, I am not an expert—that there is that mandatory reporting. There is not only the reporting, but you need a system that can analyze and recognize patterns and then have some ability to get in front of those patterns.

And I know you have had experience with that in the medical device industry, where the combination of software and hardware interact, indeed more often the software fails than the hardware.

We have talked to a former Administrator of NHTSA who said that there was some sort of an auto—mandatory reporting in the auto industry and an analyzing of those records. It may very well be, I don't know, that there is a more mature reporting and analysis on the auto side. I don't know the state of that program right now.

But there is a lot of information to collect besides GPS data and where these planes are on these functions. And for us, we wish the FAA had gotten ahead of it and not—you know, I am sure they are doing their job as best they can, but to get ahead of it. And like it was said, that it was Mr. DeFazio said, we now have 346 tombstones. If it is a tombstone agency, let's make some changes, and that is part of it.

Ms. CRAIG. Thank you.

Mr. Njoroge, do you have anything to add?

Mr. NJOROGE. Not at the moment. Thank you.

Ms. CRAIG. Thank you.

Mr. Chairman, I yield back.

Mr. LARSEN. Mr. Njoroge, Mr. Stumo, and the families, thank you very much for being willing to testify today. I want to commend to the Members your written testimony. If everyone has not had a chance to read the written testimony, it is equally compelling.

What you offered us today is not just additional pathways for us as a committee to explore in our oversight. More importantly, you are putting a face to what can seem to the outside to be a very bureaucratic, very step-by-step, very incremental investigation.

But your presence is a reminder to all of us that the flying public, the individuals who get on these airplanes, the families who get on these airplanes, are much more important than the other folks that we tend to listen to around here. And I appreciate your willingness to spend some time with us to remind us of that.

Thank you very much.

With that, the committee will excuse, and we will do a transition for 5 minutes.

Thank you.

Mr. STUMO. Thank you, Mr. Chairman.

Mr. NJOROGE. Thank you.

[Recess.]

Mr. LARSEN. We will get started.

I would like to welcome our witnesses to the second panel.

Ms. Dana Schulze, Acting Director, Office of Aviation Safety of the NTSB; Captain Joe DePete, president of Air Line Pilots Association, International; Ms. Lori Bassani, national president, the Association of Professional Flight Attendants; Mr. Mike Perrone, national president, Professional Aviation Safety Specialists; and Mr. John Samuelsen, international president, Transport Workers Union.

Thank you for being here today. We do look forward to your testimony.

In my opening statement, I made comments about what I would like to hear from each of you. And without objection, though, our witnesses' full statements will be included in the record. And since your written testimony has been made part of the record, the subcommittee requests that you limit your oral testimony to 5 minutes.

With that, Ms. Schulze, you may now proceed.

TESTIMONY OF DANA SCHULZE, ACTING DIRECTOR, OFFICE OF AVIATION SAFETY, NATIONAL TRANSPORTATION SAFETY BOARD; CAPTAIN JOSEPH G. DEPETE, PRESIDENT, AIR LINE PILOTS ASSOCIATION, INTERNATIONAL; LORI BASSANI, NATIONAL PRESIDENT, ASSOCIATION OF PROFESSIONAL FLIGHT ATTENDANTS; MICHAEL PERRONE, PRESIDENT, PROFESSIONAL AVIATION SAFETY SPECIALISTS, AFL–CIO; AND JOHN SAMUELSEN, INTERNATIONAL PRESIDENT, TRANSPORT WORKERS OF AMERICA

Ms. SCHULZE. Thank you. Good morning, Chairman Larsen, Ranking Member Graves, and members of the subcommittee. Thank you for inviting the National Transportation Safety Board to testify. I am the Acting Director of the Office of Aviation Safety within the NTSB.

First, I would like to express my condolences to the loved ones of those lost in recent aviation disasters. We must learn from their pain and strive to close the gaps in safety that allowed these tragedies to happen.

The NTSB is an independent Federal agency charged by Congress with investigating every civil aviation accident and certain incidents in the United States and issuing safety recommendations aimed at preventing future accidents. We conduct about 1,400 investigations each year.

In the last decade, the number of aviation accidents and deaths have declined overall, from 539 fatalities in 2009 to 401 in 2018. Nearly 92 percent were in general aviation. The remainder, primarily part 135 operations, represent a prominent gap in aviation safety that is on our Most Wanted List.

Currently, air medical, air taxi, charter, and on-demand operators are not required to meet some of the same safety requirements that have proven effective at enhancing the safety of commercial airline operations.

In March, the board completed an investigation of a part 135 Learjet that crashed in Teterboro, New Jersey. Based on the findings, the NTSB again reiterated recommendations to the FAA to require flight data monitoring programs and safety management systems for part 135 operations.

Since completing this investigation, we have initiated another 13 investigations into part 135 accidents and incidents.

The safety issues were not new to the Teterboro accident. The NTSB had originally issued these recommendations following a 2015 crash in Akron, Ohio, reiterated them following a 2016 accident in Togiak, Alaska, and again following the Teterboro accident.

We have also made recommendations to the FAA that aircraft operating under part 121 and 135 be equipped with a crash-protected cockpit image recording system. These recorders would help focus and expedite investigations and the development of targeted safety recommendations to reduce risks to the traveling public. These recommendations are currently open—unacceptable response.

Unfortunately, there are also cases of paying passengers aboard aircraft where the operation is exempt from part 135. On June 21, a skydiving flight crashed in Hawaii, killing 11. In March 2018, a sightseeing flight crashed in New York, killing five. Both flights were operating under less stringent part 91.

Regardless of the purpose of the flight or the type of aircraft, commercial aviation should be safe.

Our Most Wanted List also includes strengthening occupant protection. Seatbelts and restraints do reduce injury and death. Without their use, preventable deaths will continue to occur.

We have recommended that the FAA require all general aviation airplanes be retrofitted with shoulder harnesses. The FAA has not required them on aircraft manufactured before 1986 for economic reasons. This recommendation was closed—unacceptable action.

This week marks the 30th anniversary of the United flight 232 crash in Sioux City, Iowa, where 111 were killed and 172 injured. Four infants were on board that aircraft. In preparation for the emergency landing, all were held by adults as instructed by the crew. The forces were too great, all were ejected from the adults' grip and injured, one fatally.

We recommended the FAA prohibit children from being lap held on commercial flights. Children are safest when they are properly secured in their own seat.

Even when occupants use appropriate restraints, inadequate evacuation procedures can also cause otherwise survivable crashes to turn fatal.

Evidence of passengers retrieving carry-on baggage during recent emergency evacuations demonstrates that previous actions to mitigate this potential safety hazard have not been effective.

We recommended the FAA develop best practices through an industry working group for evacuation. This recommendation is currently open—unacceptable response.

Last, another area of concern for emerging transportation technologies, such as unmanned aircraft and commercial space systems operations. The NTSB continues to grow its expertise in both areas, completing our first commercial space investigation in 1993 and

first investigation of a mid-air collision between an aircraft and a drone in 2016.

As the number of these operations grow, it is inevitable that the need for our investigations will, too. We continue our focus in these areas and appreciate this committee's commitment to ensuring we have the resources to proactively be ready to advance safety into the future.

Thank you again for the opportunity to discuss the work that the NTSB is doing to make transportation safer. There continues to be room for improvement, and the NTSB stands ready to work with you to improve the safety of our Nation's aviation systems for all users.

I am happy to take your questions.

[Ms. Schulze's prepared statement follows:]

Prepared Statement of Dana Schulze, Acting Director, Office of Aviation Safety, National Transportation Safety Board

Good morning, Chairman Larsen, Ranking Member Graves, and Members of the Subcommittee. Thank you for inviting the National Transportation Safety Board (NTSB) to testify before you today. I am the Acting Director of the Office of Aviation Safety within the NTSB.

The NTSB is an independent federal agency charged by Congress with investigating every civil aviation accident in the United States and significant accidents in other modes of transportation—highway, rail, marine, and pipeline. We determine the probable cause of the accidents we investigate, and we issue safety recommendations aimed at preventing future accidents. In addition, we conduct special transportation safety studies and special investigations and coordinate the resources of the federal government and other organizations to assist victims and their family members who have been impacted by major transportation disasters. The NTSB is not a regulatory agency—we do not promulgate operating standards nor do we certificate organizations and individuals. The goal of our work is to foster safety improvements, through formal and informal safety recommendations, for the traveling public.

We investigate all civil domestic air carrier, commuter, and air taxi accidents; general aviation accidents; and certain public-use aircraft accidents, amounting to approximately 1,400 investigations of accidents and incidents annually. We also participate in investigations of airline accidents and incidents in foreign countries that involve US carriers, US-manufactured or -designed equipment, or US-registered aircraft.

I would like to thank the committee for being a continued partner in safety. Last year, you addressed multiple NTSB safety recommendations in the *FAA Reauthorization Act of 2018*. Based on our investigations, the NTSB recommended applying second-class medical requirements to commercial balloon operators, requiring all rotorcraft to meet certain minimum crashworthiness requirements to protect fuel systems, and sufficiently marking and maintaining in a database all meteorological evaluation towers.[1] When Congress passed the *FAA Reauthorization Act of 2018* you required the Federal Aviation Administration (FAA) to close these safety gaps.[2]

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

For the last decade, the US aviation system has experienced a record level of safety, and the number of US-registered civil aviation accidents has declined overall.[3] Deaths associated with US civil aviation accidents decreased from 539 in 2009 to preliminarily 401 in 2018. Nearly 92 percent of aviation fatalities in 2018 occurred

[1] National Transportation Safety Board, Safety Recommendations A-17-034, A-15-012, A-13-016, and A-13-017.

[2] Public Law 115-254.

[3] National Transportation Safety Board, 2017 preliminary aviation statistics. Accident data for calendar year 2018 are still being validated and have not yet been released.

in general aviation and non-commercial accidents, with the remainder primarily in Title 14 *Code of Federal Regulation*s (CFR) Part 135 operations, which include charters, air taxis, and air medical services flights. Until 2018, there had been no passenger fatalities as a result of accidents involving US air carriers operating under the provisions of 14 CFR Part 121 since the crash of Colgan Air flight 3407 in 2009.[4] This unprecedented period of safety came to an end on April 17, 2018, when the Southwest Airlines Flight 1380 accident involving an uncontained engine failure resulted in a first passenger.[5] Over the last several decades, significant advances in technology, important legislative and regulatory changes, and more comprehensive crew training have contributed to the current level of aviation safety. However, we continue to see accidents and incidents that remind us of the need to be ever vigilant.

On February 4, 2019, we announced our Most Wanted List of Transportation Safety Improvements for 2019-2020.[6] This list identifies 10 focus areas for transportation safety improvements based on issues identified through our investigations. Many of the issues on the Most Wanted List address multimodal challenges for improving safety, including many that have been identified in some of our aviation accident investigations, such as alcohol and other drug impairment, distraction, occupant protection, fatigue, medical fitness, and safe shipment of hazardous materials.

MOST WANTED LIST—IMPROVE THE SAFETY OF PART 135 FLIGHT OPERATIONS

On the Most Wanted List, one issue area is specific to aviation: improving the safety of Part 135 flight operations. Regardless of the purpose of the flight or the type of aircraft, all passenger-carrying flights should be safe. However, currently, air medical service, air taxi, charter, and on-demand operators are not required to meet some of the same safety requirements that have proven effective at enhancing the safety of commercial airline operations. On March 12, 2019, the NTSB issued three new safety recommendations and reiterated six previous safety recommendations to the FAA as a result of the investigation of an accident that occurred on May 15, 2017, in Teterboro, New Jersey.[7] In this accident, a Learjet 35A, operated by a Part 135 operator, Trans-Pacific Air Charter, departed controlled flight while on a circling approach to Teterboro Airport and impacted a commercial building and parking lot. The pilot-in-command and the second-in-command died; there were no passengers on the aircraft and no one on the ground was injured. While the aircraft was operating as a Part 91 positioning flight at the time of the accident, the accident raised concerns about the safety of Part 135 operations and the need for effective flight data monitoring (FDM) programs, safety management systems (SMS), procedures to identify pilots who do not comply with standard operating procedures, programs to address pilots with performance deficiencies, and the need for enhanced guidance for crew resource management training and leadership training for upgrading captains.

The safety issues identified in the Teterboro accident were not new; the NTSB had previously identified these issues and made recommendations to address FDM equipment and programs and SMS as a result of the investigation of the November 10, 2015, crash of Execuflight flight 1526 in Akron, Ohio.[8] The recommendations were reiterated following the October 26, 2016, crash of Ravn Connect flight 3153 in Togiak, Alaska, and again following the Teterboro accident.[9]

Since completing the investigation in Teterboro, New Jersey and issuing safety recommendations, the NTSB has initiated another 13 investigations into Part 135 accidents and incidents, of which five were fatal crashes—including the May 13 mid-

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

[5] The Southwest Airlines flight 1380 investigation is ongoing. An investigative hearing was conducted on November 14, 2018.

[6] National Transportation Safety Board, *2019-2020 Most Wanted List*.

[7] National Transportation Safety Board, *Departure From Controlled Flight, Trans-Pacific Air Charter, LLC, Learjet 35A, N452DA, Teterboro, New Jersey (Abstract)*, Rpt. No. AAR-19/02 (Washington, DC: NTSB, 2019).

[8] National Transportation Safety Board, *Crash During Nonprecision Instrument Approach to Landing, Execuflight Flight 1526, British Aerospace HS 125-700A, N237WR*, Rpt. No. AAR 16/02 (Washington, DC: NTSB 2016).

[9] National Transportation Safety Board, *Collision with Terrain, Hageland Aviation Services, Inc., dba Ravn Connect Flight 3153, Cessna 208B, N208SD*, Rpt. No. AAR 18/02 (Washington, DC: NTSB 2018).

air collision between two aircraft on sightseeing flights in Ketchikan, Alaska.[10] Further, there are cases of paying passengers aboard aircraft where the operation is exempt from Part 135, such as the June 21 crash of an Oahu Parachute Center skydiving flight in Mokuleia, Hawaii, where all 10 passengers and one crewmember were fatally injured, and the March 11, 2018, crash of a FlyNYON sightseeing flight in New York City where five passengers were fatally injured. Both flights were operating under Part 91.

A list of the safety recommendations we have made regarding Part 135 operations is appended to this testimony. Implementation of these and other recommendations could prevent or mitigate many of the Part 135 crashes that the NTSB investigates, and that is why "Improve the Safety of Part 135 Aircraft Operations" is included on the Most Wanted List.

MOST WANTED LIST—REDUCE FATIGUE-RELATED ACCIDENTS

Fatigue is a pervasive problem in transportation that degrades a person's ability to stay awake, alert, and attentive to the demands of safely controlling a vehicle, vessel, aircraft, or train. By including "Reduce Fatigue-Related Accidents" on our Most Wanted List, we are calling for a comprehensive approach to combatting fatigue in transportation, focusing on research, education, and training; technology; sleep disorder treatment; hours-of-service regulations; and on- and off-duty scheduling policies and practices.

Over the last 20 years, the NTSB has investigated many air carrier accidents involving fatigued flight crews, including Colgan Air flight 3407. As a result of that investigation, we recommended that the FAA require operators to address fatigue risks associated with commuting.[11] The FAA's final rule for Fatigue Risk Management Plans for Part 121 Air Carriers did not address this recommendation. In 2006, we issued a safety recommendation to the FAA as a result of our investigation of the October 19, 2004, crash of Corporate Airlines Flight 5966 in Kirksville, Missouri, to "modify and simplify the flight crew hours-of-service regulations to take into consideration factors such as length of duty day, starting time, workload and other factors shown by recent research, scientific evidence, and current industry experience to affect crew alertness."[12] On January 4, 2012, the FAA published a final rule that prescribed new flight- and duty-time regulations for all flight crewmembers and certificate holders conducting passenger operations under Part 121, but excluded operators who conduct cargo operations.[13] The NTSB disagrees with this exclusion, as many of the fatigue-related accidents that we have investigated over the years involved cargo operators. We also believe that, because of the time of day that cargo operations typically occur, such operations are in greater need of these requirements. The NTSB believes that the FAA should include all Part 121 operations, including cargo operations, under these requirements.

MOST WANTED LIST—STRENGTHEN OCCUPANT PROTECTION

Seat belts and restraints reduce the risk of injury and death to pilots and passengers in the event of an accident. To minimize deaths and injuries, we must increase the use of existing restraint systems, otherwise preventable deaths will continue to occur. In 2011, we conducted a study on airbag performance in general aviation, which supported the idea that shoulder harnesses can reduce injury in an accident.[14] As a result of that study, we recommended that the FAA require that all general aviation airplanes be retrofitted with shoulder harnesses if they don't already have them. In 2013, the FAA reported that, because the economic burden on the general aviation community would outweigh any potential benefit, the agency would not mandate that aircraft manufactured before December 12, 1986, be retrofitted with shoulder harnesses or with a two-point inflatable lap restraint. The recommendation has been classified as "Closed—Unacceptable Action."[15]

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[10] See Appendix for list of open Part 135 investigations.

[11] National Transportation Safety Board, Safety Recommendation A-10-016.

[12] National Transportation Safety Board, *Collision with Trees and Crash Short of the Runway, Corporate Airlines Flight 5966 BAE Systems BAE-J3201, N875JX Kirksville, Missouri*, Rpt. No. AAR-06/01 (Washington, DC: NTSB, 2006). National Transportation Safety Board, Safety Recommendation A-06-010.

[13] Federal Aviation Administration, *Flightcrew Member Duty and Rest Requirements*, 14 CFR Parts 117, 119, and 121.

[14] National Transportation Safety Board, *Airbag Performance in General Aviation Restraint Systems*, Rpt. No. SS-11/01 (Washington, DC: NTSB, 2011).

[15] National Transportation Safety Board, Safety Recommendation A-11-004.

This week marks the 30th anniversary of the United Airlines flight 232 crash in Sioux City, Iowa.[16] Of the 296 people on board the aircraft, 110 passengers and 1 flight attendant were fatally injured, and another 172 sustained varying degrees of injury. On this flight, there were four infant passengers; all were being held by adults, as instructed during preparation for the emergency landing. All the infants were injured, one fatally. Following this crash and another in 1994 in Charlotte, North Carolina, the NTSB recommended the FAA remove the exemption that allows for children to be lap-held on commercial aviation flights.[17] We issued similar recommendations again in 2010. These recommendations are all classified as "Closed—Unacceptable Action."[18] Children are safest when they are properly secured in a child safety seat in their own seat when flying.

Airplane Evacuations

Additionally, even when occupants use appropriate restraints, deaths and injuries may still occur because of inadequate evacuation procedures. In many cases, otherwise survivable crashes turn fatal because occupants cannot evacuate before a postcrash fire consumes the aircraft. On October 28, 2016, American Airlines flight 383, bound for Miami, Florida, experienced a right engine uncontained failure and subsequent fire during takeoff at Chicago O'Hare International Airport.[19] The flight crew aborted the takeoff and stopped the aircraft on the runway, and an emergency evacuation was conducted. Of the 161 passengers and 9 crewmembers onboard, one passenger was seriously injured during the evacuation. A turbine disk in the right engine fractured into at least four pieces, with one piece going through the inboard section of the right wing, over the fuselage, and into a warehouse facility a half mile away. The airplane was substantially damaged by the fire, which was caused by a fuel leak from the right wing fuel tank that resulted in a pool of fire under the right wing.

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

One of the recommendations to the FAA addresses passengers evacuating airplanes with carry-on baggage, which has been a recurring concern. Flight attendants are trained to instruct passengers not to evacuate with carry-on baggage because doing so could potentially slow the egress of passengers during an evacuation and block an exit during an emergency. In June 2000, we released a safety study on emergency evacuations of commercial airplanes, which found that passengers exiting with carry-on baggage were "the most frequently cited obstruction to evacuation."[20]

Video taken during the Chicago evacuation and postaccident interviews with flight attendants indicated that some passengers evacuated from all three usable exits with carry-on baggage. In one case, a flight attendant tried to take a bag away from a passenger who did not follow the instruction to evacuate without baggage, but the flight attendant realized that the struggle over the bag was prolonging the evacuation and allowed the passenger to take the bag. In another case, a passenger came to the left overwing exit with a bag and evacuated with it despite being instructed to leave the bag behind. In addition, videos from an evacuation due to a fire on a British Airways aircraft in Las Vegas on September 8, 2015, and a Dynamic International Airways aircraft in Fort Lauderdale on October 29, 2015,

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[16] National Transportation Safety Board, *United Airlines Flight 232 McDonnell Douglas DC-10-10*, Rpt. No. AAR-90/06 (Washington, DC: NTSB, 1990).

[17] National Transportation Safety Board, *Flight into Terrain during Missed Approach USAir 1016, DC-9-31, N954VJ*, Rpt. No. AAR-95/03 (Washington, DC: NTSB 1995).

[18] National Transportation Safety Board, Safety Recommendation A-90-078, A-95-051, A-10-121, A-10-122, and A-10-123.

[19] National Transportation Safety Board, *Uncontained Engine Failure and Subsequent Fire, American Airlines Flight 383, Boeing 767-323, N345AN*, Rpt. No. AAR-18/01 (Washington, DC: NTSB 2018).

[20] National Transportation Safety Board, *Emergency Evacuation of Commercial Airplanes*, Rpt. No. SS-00/01, (Washington, DC: NTSB 2000).

showed passengers evacuating with carry-on baggage despite the standard instruction to leave their baggage and similar items behind in the event of an emergency.[21]

Evidence of passengers retrieving carry-on baggage during recent emergency evacuations demonstrates that previous actions to mitigate this potential safety hazard have not been effective. As a result of the Chicago investigation, we recommended that the FAA (1) measure the potential delays associated with passengers retrieving and carrying baggage during an emergency evacuation and (2) determine the appropriate countermeasures to mitigate any related potential safety risks.[22]

We have also seen positive outcomes from implementing NTSB safety recommendations and successfully evacuating an aircraft post-accident. On March 8, 2017, a Boeing MD-83 overran a runway during a rejected takeoff in Ypsilanti, Michigan. Seconds after reaching the takeoff decision airspeed of 158 mph at about 5,000 feet down a 7,500-foot runway, the captain's attempt to raise the nose and get the plane airborne was unsuccessful due to an undetected mechanical malfunction of an elevator. The pilot called "abort." The airplane decelerated following the rejected takeoff but was traveling too fast to be stopped on the remaining runway. It departed the end of the runway at about 115 mph, traveled 950 feet across a runway safety area (RSA), struck an airport fence and came to rest after crossing a paved road. An evacuation was ordered. Flight attendants described that during the evacuation the passengers were incredibly calm and responsive, followed flight attendant directions, and did not take or attempt to take luggage or personal belongings with them. The 110 passengers and 6 flight crewmembers evacuated the airplane via emergency escape slides without any serious injuries.[23]

In Ypsilanti, the RSA likely contributed to the lack of serious injuries. In response to an NTSB recommendation, the FAA in 1999 began a national program to add RSAs to many commercial airports.[24] However, there are additional gaps in runway safety.

ADDITIONAL SAFETY ISSUES

Runway safety

Around midnight on July 7, 2017, Air Canada flight 759 was cleared to land on runway 28R at San Francisco International Airport (SFO), but instead lined up on a parallel taxiway where four air carrier airplanes were awaiting takeoff clearance. Flight 759 descended below 100 feet above the ground, and the flight crew initiated a go-around about the time it overflew the first airplane on the taxiway. The airplane reached a minimum altitude of about 60 feet and overflew the second airplane on the taxiway before starting to climb.[25]

We held a Board meeting on September 25, 2018, to determine the probable cause of the SFO incident and to issue relevant safety recommendations. The Board determined that the flight crew misidentified a taxiway as the intended landing runway, which resulted from the crewmembers' lack of awareness of the parallel runway closure due to their ineffective review of notice to airmen (NOTAM) information before the flight and during the approach briefing. Contributing to the incident were (1) the flight crew's failure to tune the instrument landing system frequency for backup lateral guidance, expectation bias, fatigue due to circadian disruption and length of continued wakefulness, and breakdowns in crew resource management, and (2) Air Canada's ineffective presentation of approach procedure and NOTAM information. The Board adopted six new recommendations to the FAA. These recommendations include developing and requiring technology to alert pilots and air traffic controllers when an airplane is not aligned with a runway surface.[26]

Lithium-ion Batteries

On July 28, 2011, a scheduled cargo flight from Incheon, Republic of Korea, to Shanghai, China, crashed into international waters. The Korean Aviation and Rail-

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[21] National Transportation Safety Board, Aviation Accident Final Report for accident number DCA15FA185.

[22] National Transportation Safety Board, Safety Recommendation A-18-009. Classified "Open—Acceptable Response."

[23] National Transportation Safety Board, *Runway Overrun During Rejected Takeoff Ameristar Air Cargo, Inc. dba Ameristar Charters, flight 9363 Boeing MD-83, N786TW Ypsilanti, Michigan March 8, 2017*, Rpt. No. AAR-19/01 (Washington, DC: NTSB 2001).

[24] National Transportation Safety Board, Safety Recommendation A-03-011. Classified "Closed—Acceptable Action."

[25] National Transportation Safety Board, *Taxiway Overflight, Air Canada Flight 759, Airbus A320-211, C-FKCK, San Francisco, California, July 7, 2017*, Rpt. No. AIR-18/01, (Washington, DC: NTSB 2018).

[26] National Transportation Safety Board, Safety Recommendations A-18-025, A-18-026, and A-18-027.

way Accident Investigation Board (ARAIB) completed its investigation on July 24, 2015 and determined that the cause of this accident was a fire that developed on or near two pallets containing dangerous goods packages, including hybrid-electric vehicle lithium ion batteries and flammable liquids. The NTSB aided the ARAIB's investigation. Based on our participation, on February 9, 2016, we issued two recommendations to the Pipeline and Hazardous Materials Safety Administration (PHMSA) to (1) require the physical segregation of lithium batteries from flammable liquid cargo and (2) establish the maximum loading density of lithium batteries on board an aircraft. Both of these recommendations are classified as "Open—Acceptable Response."[27]

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

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

INTERNATIONAL AVIATION ACCIDENT INVESTIGATIONS

The NTSB participates in the investigation of aviation accidents and serious incidents outside the United States in accordance with the Chicago Convention of the International Civil Aviation Organization (ICAO) and the Standards and Recommended Practices (SARPS) provided in Annex 13 to the Convention.[28] If an accident or serious incident occurs in a foreign state involving a US-registered civil aircraft, US operator, or US-designed or -manufactured aircraft, and the foreign state is a signatory to the ICAO Convention, that state is responsible for the investigation and controls the release of all information regarding the investigation.[29]

In accordance with the ICAO Annex 13 SARPS, upon receiving a formal notification of the accident or serious incident that may involve significant issues, the NTSB may designate a US Accredited Representative and appoint technical advisors to assist the foreign investigation and facilitate the sharing of safety information. The advisors may include NTSB investigators with subject matter expertise, as well as others from US manufacturers, operators, and the FAA.

The following are the key objectives of our participation in international aviation accident investigations:

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

Given the international nature of air transportation and the leading role the United States plays in developing aviation technology, our participation in foreign investigations is essential to enhancing aviation safety worldwide. In 2018, we appointed accredited representatives to 328 international investigations, and traveled to support work on 18 of those investigations.[30]

Boeing 737 MAX Investigations—Jakarta, Indonesia, and Addis Ababa, Ethiopia

On October 29, 2018, a Boeing 737 MAX 8, operated by Lion Air, crashed into the Java Sea shortly after takeoff from Soekarno-Hatta International Airport, in Jakarta, Indonesia, killing all 189 passengers and crew on board. The Komite

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[27] National Transportation Safety Board, Safety Recommendations A-16-001, A-16-002.

[28] ICAO is a UN specialized agency that manages the administration and governance of the Convention on International Civil Aviation (Chicago Convention), (https://www.icao.int/about-icao/Pages/default.aspx).

[29] There are 193 Member States of ICAO, including both Indonesia and Ethiopia, (https://www.icao.int/MemberStates/Member%20States.English.pdf).

[30] The NTSB appointed an accredited representative to 206 accidents, 98 incidents, and 24 other safety-related occurrences in 2018. NTSB traveled in support of 9 of these accidents and 9 of the incidents.

Nasional Keselamatan Transportasi (KNKT) of Indonesia, who is leading the investigation, released a preliminary report on the accident on November 27, 2018.[31] On March 10, 2019, a Boeing 737 MAX 8, operated by Ethiopian Airlines, crashed after takeoff from Addis Ababa Bole International Airport in Ethiopia, killing all 157 passengers and crew, including 8 American citizens. The investigation is being led by the Ethiopia Accident Investigation Bureau (AIB), which released a preliminary report on April 4, 2019.[32]

Because the MAX 8 was designed and manufactured in the United States, in accordance with ICAO Annex 13, the United States is afforded the right to participate in both investigations. Accordingly, the NTSB appointed accredited representatives to assist in both ongoing investigations.

Following last year's Lion Air crash, the NTSB immediately dispatched investigators to Indonesia to participate in the Indonesian government's investigation. An NTSB investigator was stationed onboard one of the search vessels during the search for the critical "black boxes"—the flight data recorder (FDR) and cockpit voice recorder (CVR). When the CVR was recovered on January 14, 2019, the NTSB recalled four investigators from furlough (due to the partial government shutdown) to assist with properly transcribing the recorder's content.[33]

In response to the Ethiopian Airlines crash, an NTSB team of investigators was dispatched to Ethiopia. Once the recovered recorders were sent to the Bureau d'Enquêtes et d'Analyses pour la Sécurité de l'Aviation Civile, we sent recorder, flight crew operations, and human factors investigators to France to assist with downloading and reading out the recorders' contents.

In accordance with ICAO Annex 13, technical advisors from the FAA, Boeing, and General Electric have accompanied NTSB investigators to the Lion Air and Ethiopian Airlines accident sites to provide their specialized technical knowledge regarding the aircraft and its systems.

Although the NTSB is actively involved in these investigations, ICAO Annex 13 requires that, as the states of occurrence, Indonesia and Ethiopia are responsible for leading their respective investigations. As such, they control the release of all investigative information to the public related to those accidents. Annex 13 provides for other involved states to gain timely access to investigative information for the purposes of continued operational safety. As a result, NTSB participation in foreign accident investigations enables safety deficiencies to be promptly addressed by the FAA, the manufacturer, or the operator, as well as others deemed appropriate, and through NTSB safety recommendations, when needed. Because the United States is the state of design and certification of the aircraft involved in these accidents, we are examining relevant factors in the US design certification process to ensure any deficiencies are captured and addressed, including by NTSB safety recommendations, if necessary.

EMERGING TRANSPORTATION TECHNOLOGIES

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

Commercial Space

We have been involved in commercial space accident investigations for over 25 years, since leading the investigation of a procedural anomaly associated with the launch of an Orbital Sciences Corporation Pegasus expendable launch vehicle in 1993.[34] Most recently, we led the investigation of the fatal in-flight breakup of

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[31] Komite Nasional Keselamatan Transportasi, Preliminary Report No. KNKT.18.10.35.04.

[32] Ethiopia Accident Investigation Bureau, Report No. AI-01/19.

[33] Due to a lapse of appropriations from December 22, 2018, through January 25, 2019, the NTSB furloughed all investigative staff. In accordance with the provisions of the Anti-Deficiency Act (including sections 1341(a)(1)(B) and 1342 of Title 31, United States Code), allowable agency functions were limited to those where "failure to perform those functions would result in an imminent threat to the safety of human life or the protection of property." Due to the potential safety issues associated with the Lion Air crash, the NTSB responded by recalling four investigative staff from furlough to participate in the CVR readout.

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

SpaceShipTwo in October 2014.[35] Foremost among the safety issues identified in the 2014 accident was the need to consider and protect against human error for safe manned spaceflight, which is the responsibility of designers, operators, and regulators. We made recommendations to the FAA and the commercial spaceflight industry to establish human factors guidance for commercial space operators and to strengthen the FAA's evaluation process for experimental permit applications by promoting stronger collaboration between FAA technical staff and commercial space vehicle operators.

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

Unmanned Aircraft Systems

The growing number of UASs and reports of near-collisions with manned aircraft have raised safety concerns regarding UAS integration into the national airspace system. In August 2010, we revised our 14 CFR Part 830 regulations to indicate that accident and incident notification requirements also apply to unmanned aircraft.[36] An advisory to operators was released in July 2016 clarifying the reporting requirements (i.e., if there is death or serious injury, the aircraft weighs more than 300 pounds and sustains substantial damage, or other specific serious incidents occur).[37]

On September 21, 2017, the pilot of a US Army UH-60 helicopter reported an inflight collision with a small UAS just east of Midland Beach, Staten Island, New York. The helicopter sustained damage to its main rotor blade, window frame, and transmission deck. We determined that the probable cause of the incident was the failure of the UAS pilot to see and avoid the helicopter due to his intentional flight beyond visual line of sight. Contributing to the incident was the UAS pilot's incomplete knowledge of regulations and safe operating practices.[38] As the number and complexity of UAS operations continues to grow, it is inevitable that the number of NTSB UAS investigations will also increase.

We are also using UASs as an accident investigation tool in all modes. The NTSB appreciates this Committee's and Congress' support of a provision in our 2018 reauthorization that authorized the agency to acquire small UASs for investigative purposes.[39] UASs are rapidly becoming a standard tool in the domestic and international accident investigation community. Small UASs can be very rapidly deployed, which allows wreckage fields to be documented quickly and thoroughly when the accident area must be cleared expeditiously for safety or operational purposes. In addition, small UASs can access unique points of view useful to the investigator as well as areas otherwise inaccessible. Data collected is shared immediately within the investigative process, allowing investigators, managers, and support staff in distant locations instant access to accident site information in order to help focus the investigation on critical aspects of the accident.

CONCLUSION

Over the last decade, general aviation safety has improved and commercial aviation accidents have become exceedingly rare. However, while accidents and incidents still occur, there will always be room for improvement. The NTSB and staff stand ready to work with the Committee to continue improving the safety of our nation's aviation system for all users.

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

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

[36] 49 CFR § 830.2 (2010).

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

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

[39] 49 USC § 1113(b)(1)(J) (2018).

Ongoing Major Part 121 Investigations (as of July 8, 2019)

- Southwest Flight 1380 engine failure, Philadelphia, Pennsylvania, April 17, 2018, one fatality, eight injuries
- Atlas Air Flight 3591 crash, Baytown, Texas, February 23, 2019, three fatalities
- Miami Air Flight 293 departed runway, Jacksonville, Florida, May 3, 2019, no serious injuries
- United Airlines Flight 4933 missed runway, Presque Isle, Maine, March 4, 2019, three minor injuries

Ongoing Major Part 135 investigations (as of July 8, 2019)

- Taquan Air scheduled commuter flight crash, Metlakatla, Alaska, May 20, 2019, two fatalities
- Mid-air collision of sightseeing flights, Ketchikan, Alaska, May 13, 2019, six fatalities and nine serious injuries
- Novictor Aviation sightseeing flight crash, Kailua, Hawaii, April 29, 2019, three fatalities
- K2 Aviation sightseeing flight crash, Talkeetna, Alaska, August 4, 2018, five fatalities

Ongoing Major Part 91 investigations with paying passengers (as of July 8, 2019)

- Oahu Parachute Center skydiving flight crash, Mokuleia, Hawaii, June 21, 2019, 11 fatalities
- The Jumping Place Skydiving Center skydiving flight crash, Swainsboro, Georgia, August 25, 2018, four fatalities
- FlyNYON sightseeing flight crash, New York City, New York, March 11, 2018, five fatalities, one injury

Safety Recommendations to the Federal Aviation Administration on the Most Wanted List—Improve Safety of Part 135 Flight Operations (as of July 8, 2019)

Number	Date Issued	Status	Safety Recommendation
A-07-018	2/27/07	Open—Acceptable Response	TO THE FEDERAL AVIATION ADMINISTRATION: In cooperation with Hawaii commercial air tour operators, aviation psychologists, and meteorologists, among others, develop a cue-based training program for commercial air tour pilots in Hawaii that specifically addresses hazardous aspects of local weather phenomena and in-flight decision-making.
A-07-019	2/27/07	Open—Acceptable Response	TO THE FEDERAL AVIATION ADMINISTRATION: Once a cue-based training program that specifically addresses hazardous aspects of local weather phenomena and weather-related, decision-making issues is developed (as requested in Safety Recommendation A-07-18), require all commercial air tour operators in Hawaii to provide this training to newly hired pilots.
A-07-112	12/21/07	Open—Acceptable Response	TO THE FEDERAL AVIATION ADMINISTRATION: Ensure that the minimum equipment lists for helicopters used in helicopter emergency medical services operations require that radar altimeters be operable during flights conducted at night.
A-09-092	9/24/09	Closed—Acceptable Action	TO THE FEDERAL AVIATION ADMINISTRATION: Permit the helicopter emergency medical services (HEMS) Aviation Digital Data Service Weather Tool to be used by HEMS operators as an official weather product.

Safety Recommendations to the Federal Aviation Administration on the Most Wanted List—Improve Safety of Part 135 Flight Operations (as of July 8, 2019)			
Number	**Date Issued**	**Status**	**Safety Recommendation**
A-10-029	2/23/10	Open—Acceptable Response	TO THE FEDERAL AVIATION ADMINISTRATION: Require 14 Code of Federal Regulations Part 121, 135, and 91K operators to (1) routinely download and analyze all available sources of safety information, as part of their flight operational quality assurance program, to identify deviations from established norms and procedures; (2) provide appropriate protections to ensure the confidentiality of the deidentified aggregate data; and (3) ensure that this information is used for safety-related and not punitive purposes.
A-13-012	5/6/13	Open—Acceptable Response	TO THE FEDERAL AVIATION ADMINISTRATION: Require the installation of a crash-resistant flight recorder system on all newly manufactured turbine-powered, nonexperimental, nonrestricted-category aircraft that are not equipped with a flight data recorder and a cockpit voice recorder and are operating under 14 Code of Federal Regulations Parts 91, 121, or 135. The crash-resistant flight recorder system should record cockpit audio and images with a view of the cockpit environment to include as much of the outside view as possible, and parametric data per aircraft and system installation, all as specified in Technical Standard Order C197, ''Information Collection and Monitoring Systems.''
A-13-013	5/6/13	Open—Acceptable Response	TO THE FEDERAL AVIATION ADMINISTRATION: Require all existing turbine-powered, nonexperimental, nonrestricted-category aircraft that are not equipped with a flight data recorder or cockpit voice recorder and are operating under 14 Code of Federal Regulations Parts 91, 121, or 135 to be retrofitted with a crash-resistant flight recorder system. The crash-resistant flight recorder system should record cockpit audio and images with a view of the cockpit environment to include as much of the outside view as possible, and parametric data per aircraft and system installation, all as specified in Technical Standard Order C197, ''Information Collection and Monitoring Systems.''
A-15-007	1/22/15	Open—Unacceptable Response	TO THE FEDERAL AVIATION ADMINISTRATION: Require that all existing aircraft operated under Title 14 Code of Federal Regulations (CFR) Part 121 or 135 and currently required to have a cockpit voice recorder and a flight data recorder be retrofitted with a crash-protected cockpit image recording system compliant with Technical Standard Order TSO-C176a, ''Cockpit Image Recorder Equipment,'' TSO-C176a or equivalent. The cockpit image recorder should be equipped with an independent power source consistent with that required for cockpit voice recorders in 14 CFR 25.1457. (Supersedes Safety Recommendation A-00-30)

Safety Recommendations to the Federal Aviation Administration on the Most Wanted List—Improve Safety of Part 135 Flight Operations (as of July 8, 2019)			
Number	**Date Issued**	**Status**	**Safety Recommendation**
A-15-008	1/22/15	Open—Unacceptable Response	TO THE FEDERAL AVIATION ADMINISTRATION: Require that all newly manufactured aircraft operated under Title 14 Code of Federal Regulations (CFR) Part 121 or 135 and required to have a cockpit voice recorder and a flight data recorder also be equipped with a crash-protected cockpit image recording system compliant with Technical Standard Order TSO-C176a, ''Cockpit Image Recorder Equipment,'' or equivalent. The cockpit image recorder should be equipped with an independent power source consistent with that required for cockpit voice recorders in 14 CFR 25.1457. (Supersedes Safety Recommendation A-00-31)
A-16-034	11/7/16	Open—Acceptable Response	TO THE FEDERAL AVIATION ADMINISTRATION: Require all 14 Code of Federal Regulations Part 135 operators to install flight data recording devices capable of supporting a flight data monitoring program.
A-16-035	11/7/16	Open—Acceptable Response	TO THE FEDERAL AVIATION ADMINISTRATION: After the action in Safety Recommendation A-16-34 is completed, require all 14 Code of Federal Regulations Part 135 operators to establish a structured flight data monitoring program that reviews all available data sources to identify deviations from established norms and procedures and other potential safety issues.
A-16-036	11/7/16	Open—Acceptable Response	TO THE FEDERAL AVIATION ADMINISTRATION: Require all 14 Code of Federal Regulations Part 135 operators to establish safety management system programs.
A-17-035	5/9/17	Open—Acceptable Response	TO THE FEDERAL AVIATION ADMINISTRATION: Implement ways to provide effective terrain awareness and warning system (TAWS) protections while mitigating nuisance alerts for single-engine airplanes operated under 14 Code of Federal Regulations Part 135 that frequently operate at altitudes below their respective TAWS class design alerting threshold.
A-17-037	5/9/17	Open—Acceptable Response	TO THE FEDERAL AVIATION ADMINISTRATION: Work with members of the Ketchikan air tour industry to improve existing training programs aimed at reducing the risk of weather-related accidents involving continuation of flight under visual flight rules into instrument meteorological conditions, with special attention paid to the human factors issues identified in this investigation, including (1) the need to help pilots better calibrate what constitutes safe weather conditions to conduct flights based on objective standards and requirements, such as set criteria for what landmarks must be clearly visible from which locations in order to proceed on a particular route; (2) the need to help pilots who are new to the area recognize dynamic local weather patterns that can place them in a dangerous situation; and (3) operational influences on pilot decision-making.

Safety Recommendations to the Federal Aviation Administration on the Most Wanted List—Improve Safety of Part 135 Flight Operations (as of July 8, 2019)			
Number	**Date Issued**	**Status**	**Safety Recommendation**
A-17-038	5/9/17	Open—Acceptable Response	TO THE FEDERAL AVIATION ADMINISTRATION: Expand the application of Federal Aviation Administration Order 8900.1, volume 3, chapter 19, section 6, ''Safety Assurance System: Flight Training Curriculum Segments,'' paragraphs 3-1251(B) and 3-1252, which address controlled flight into terrain-avoidance training programs for 14 Code of Federal Regulations (CFR) Part 135 helicopter operations, to all 14 CFR Part 135 operations.
A-17-042	5/9/17	Open—Acceptable Response	TO THE FEDERAL AVIATION ADMINISTRATION: Analyze automatic dependent surveillance-broadcast data from Ketchikan air tour operations on an ongoing basis and meet annually with Ketchikan air tour operators to engage in a nonpunitive discussion of any operational hazards reflected in the data and collaborate on mitigation strategies for any hazards identified.
A-17-043	5/9/17	Open—Acceptable Response	TO THE FEDERAL AVIATION ADMINISTRATION: Develop and implement special operating rules for the Ketchikan air tour industry that include en route visual flight rules weather minimums that are tailored to the industry's unique requirements and are more conservative than those specified in 14 Code of Federal Regulations Part 135.
A-18-013	4/26/18	Open—Acceptable Response	TO THE FEDERAL AVIATION ADMINISTRATION: Although controlled flight into terrain (CFIT)-avoidance training programs are not required by federal regulation for Title 14 Code of Federal Regulations Part 135 fixed-wing operations, work with Part 135 operators in Alaska to improve any voluntarily implemented training programs aimed at reducing the risk of CFIT accidents involving continuation of flight under visual flight rules (VFR) into instrument meteorological conditions, with special attention paid to the human factors issues identified in recent Alaska accident investigations, including, but not limited to, (1) the challenges of flying in mountainous terrain in Alaska and low-altitude VFR flight in an area subject to rapid changes in weather; and (2) limitations of the Alaska infrastructure, particularly weather observations, communications, and navigation aids.
A-18-014	4/26/18	Open—Acceptable Response	TO THE FEDERAL AVIATION ADMINISTRATION: Work with Title 14 Code of Federal Regulations Part 135 certificate holders that operate under visual flight rules in the aircraft's required terrain awareness and warning system (TAWS) class to (1) ensure that management and pilots are aware of the risks associated with distraction (from continuous nuisance alerts) and complacency (brought about by routine use of the terrain inhibit feature); (2) develop plans for mitigating those risks and minimizing nuisance alerts; and (3) develop procedures that specifically address when pilots should test, inhibit, and uninhibit the TAWS alerts, considering the operator's typical operations and the TAWS manufacturer's guidance.
A-18-016	4/26/18	Open—Await Response	TO THE FEDERAL AVIATION ADMINISTRATION: Install communications equipment throughout Alaska, after determining what would be most effective, to allow increased access to the instrument flight rules system, giving priority to those areas used by Title 14 Code of Federal Regulations Part 135 operators.

Safety Recommendations to the Federal Aviation Administration on the Most Wanted List—Improve Safety of Part 135 Flight Operations (as of July 8, 2019)			
Number	**Date Issued**	**Status**	**Safety Recommendation**
A-18-017	4/26/18	Open—Await Response	TO THE FEDERAL AVIATION ADMINISTRATION: Ensure that Alaska airports that are served by Title 14 Code of Federal Regulations (CFR) Part 135 operators and have instrument approaches are equipped with weather-reporting capabilities to enable instrument flight rules operations in accordance with 14 CFR 135.225(a).

Safety Recommendations to the Federal Aviation Administration on the Most Wanted List—Reduce Fatigue Related Accidents (as of July 8, 2019)			
Number	**Date Issued**	**Status**	**Safety Recommendation**
A-13-003	3/1/13	Open—Acceptable Alternate Response	TO THE FEDERAL AVIATION ADMINISTRATION: Require that personnel performing maintenance or inspections under 14 Code of Federal Regulations Parts 121, 135, 145, and 91 Subpart K receive initial and recurrent training on human factors affecting maintenance that includes a review of the causes of human error, including fatigue, its effects on performance, and actions individuals can take to prevent the development of fatigue.
A-14-072	9/25/14	Open—Acceptable Response	TO THE FEDERAL AVIATION ADMINISTRATION: Require principal operations inspectors to ensure that operators with flight crews performing 14 Code of Federal Regulations Part 121, 135, and 91 subpart K overnight operations brief the threat of fatigue before each departure, particularly those occurring during the window of circadian low.
A-94-194	11/30/94	Open—Acceptable Response	TO THE FEDERAL AVIATION ADMINISTRATION: Revise the Federal Aviation Regulations contained in 14 CFR Part 135 to require that pilot flight time accumulated in all company flying conducted after revenue operations—such as training and check flights, ferry flights and repositioning flights—be included in the crewmember's total flight time accrued during revenue operations.
A-95-113	11/14/95	Open—Acceptable Response	TO THE FEDERAL AVIATION ADMINISTRATION: Finalize the review of current flight and duty time regulations and revise the regulations, as necessary, within 1 year to ensure that flight and duty time limitations take into consideration research findings in fatigue and sleep issues. The new regulations should prohibit air carriers from assigning flight crews to flights conducted under 14 Code of Federal Regulations (CFR) Part 91 unless the flight crews meet the flight and duty time limitations of 14 CFR Part 121 or other appropriate regulations.

Safety Recommendations to the Federal Aviation Administration on the Most Wanted List—Increase Occupant Protection (as of July 8, 2019)			
Number	**Date Issued**	**Overall Status**	**Safety Recommendation**
A-15-012	7/23/15	Open—Acceptable Response	TO THE FEDERAL AVIATION ADMINISTRATION: Require, for all newly manufactured rotorcraft regardless of the design's original certification date, that the fuel systems meet the crashworthiness requirements of 14 Code of Federal Regulations 27.952 or 29.952, ''Fuel System Crash Resistance.''

Safety Recommendations to the Federal Aviation Administration on the Most Wanted List—Increase Occupant Protection (as of July 8, 2019)			
Number	**Date Issued**	**Overall Status**	**Safety Recommendation**
A-16-025	10/6/16	Open—Acceptable Response	TO THE FEDERAL AVIATION ADMINISTRATION: Require 14 Code of Federal Regulations Part 121 operators to provide (1) guidance that instructs flight attendants to remain at their assigned exits and actively monitor exit availability in all non-normal situations in case an evacuation is necessary and (2) flight attendant training programs that include scenarios requiring crew coordination regarding active monitoring of exit availability and evacuating after a significant event that involves a loss of communications.
A-16-026	10/6/16	Open—Unacceptable Response	TO THE FEDERAL AVIATION ADMINISTRATION: Develop best practices related to evacuation communication, coordination, and decision-making during emergencies through the establishment of an industry working group and then issue guidance for 14 Code of Federal Regulations Part 121 air carriers to use to improve flight and cabin crew performance during evacuations.
A-18-009	2/6/18	Open—Acceptable Response	TO THE FEDERAL AVIATION ADMINISTRATION: Conduct research to (1) measure and evaluate the effects of carry-on baggage on passenger deplaning times and safety during an emergency evacuation and (2) identify effective countermeasures to reduce any determined risks, and implement the countermeasures.

Mr. LARSEN. Thank you very much.

Captain DePete, you are recognized for 5 minutes.

Mr. DEPETE. Yes, good morning.

Thank you, Chairman DeFazio, from the full committee, and Ranking Member Graves, Sam Graves, and also Chairman Larsen and Ranking Member Garret Graves, and the subcommittee members.

On behalf of the 62,000 pilots that I represent at 34 airlines in the United States and Canada, I wish to express our sincere condolences to the loved ones of the victims of the Ethiopian Airlines and Lion Air accidents. We cannot know the depth of your grief. But we can share in your determination to leave a legacy of safety improvements for those you have lost.

As a 40-year pilot, the highest standards of safety have been at the forefront of my flying career. As president of the Air Line Pilots Association, the world's largest nongovernmental aviation safety organization, I can tell you that all pilots, all airline pilots, share this dedication.

While airline accidents are rare, even one fatal accident is one too many. Over the years, ALPA has helped develop an investigation process to identify all of the contributing factors, evaluate needed changes, and most importantly, implement those changes to improve safety.

The results include the first officer qualification experience and training requirements that emerged from the Colgan 3407 investigation. These requirements are a major reason why the U.S. industry has not experienced a pilot training or operational related fatality on a U.S. passenger airline in more than 10 years. And this

is why ALPA has called upon the International Civil Aviation Organization to set global pilot standards.

But incredibly, even when safety improvements like these are codified in law, thanks to many of you here in this room today, some still seek to undermine them.

While we have made strides, we have more to do. ALPA will continue to help identify improvements, not only during these investigations, but also in the long term, through the industry's risk predictive, data-driven approach to enhancing safety.

We will never stop fighting against those who put profits before the safety of our passengers, cargo, and crew.

Our safety commitment means that ALPA will be fully involved in understanding what went wrong and evaluating how to move forward with the Boeing 737 MAX once the FAA final review is complete.

We have made clear that questions must be answered in the areas of oversight, aircraft certification, and delegation of authority. ALPA will work tirelessly to ensure that industry and Government make the changes necessary to safeguard our system.

Equally important, our industry must be more determined than ever to prevail against special interests that would have us ignore the lessons from the past.

For example, we must deliver on Congress' intent to install secondary flight deck barriers on all newly manufactured passenger aircraft, a lesson we all learned from the 9/11 Report.

And we still have work to do to achieve one level of aviation safety by applying science-based flight duty and rest requirements to pilots, like myself, who fly cargo, and mandating intrusion-resistant flight deck doors on cargo aircraft.

Likewise, our industry must continue to make improvements to safeguard the shipment of dangerous goods and lithium batteries and eliminate shipments of undeclared dangerous goods.

Today, ALPA released a new report that lays out the indisputable safety benefits of the presence of at least two fully qualified, adequately rested, and highly trained pilots on the flight deck. We know, as do our passengers, that the presence of at least two pilots on board our airliners not only contributes to a proactive, risk predictive safety culture, it is the reason why U.S. air transportation is so safe today.

The importance of a strong safety culture is one reason that ALPA opposes allowing foreign airlines with flag of convenience business models to serve the United States. These schemes create an unstable work environment for employees that can discourage proactive safety reporting.

I commend Chair DeFazio, Aviation Subcommittee Chair Larsen, Vice Chair Davids and Representative Davis, and this subcommittee for supporting legislation to enable the Department of Transportation to determine whether airlines using these harmful business practices should fly to the United States.

The House included a similar provision in the recent FAA reauthorization, and I hope the Fair and Open Skies Act will move quickly.

And to finish, as pilots, our priority is always safety. We make certain our industry learns from the tragedies we see and we make

improvements. Whether it is the decision on the return to service of the Boeing 737 MAX or to take off on every flight, it is safe to fly when the pilots in command say it is.

Thank you for giving me the opportunity to speak to you all today. Thank you.

[Mr. DePete's prepared statement follows:]

Prepared Statement of Captain Joseph G. DePete, President, Air Line Pilots Association, International

Mr. Chairman and members of the Subcommittee, thank you for the opportunity to testify on the State of Aviation Safety. On behalf of the world's largest non-governmental aviation safety organization, I can report that the view from the flight deck is that the state of safety in our skies remains sound. However, it is our organization's top priority to stay focused on continual improvement and judicious oversight to ensure that air travel is as safe as humanly possible.

The Air Line Pilots Association, International (ALPA), represents more than 62,000 professional airline pilots flying for 35 airlines in the United States and Canada. ALPA is the world's largest pilot union. We are the recognized voice of the airline piloting profession in North America, with a history of safety and security advocacy spanning more than 85 years. As the sole U.S. member of the International Federation of Airline Pilots Associations (IFALPA), ALPA has the unique ability to provide active airline pilot expertise to aviation safety issues worldwide, and to incorporate an international dimension to safety advocacy.

The pilots of ALPA express our deepest condolences to the families and loved ones of the victims of both the Ethiopian Airlines Flight 302 and Lion Air Flight 610 accidents. We cannot know the depth of the grief that they feel, but we can share in their determination to leave a legacy of a safer air transportation system for those they lost.

As a 40-year airline pilot, achieving the highest standards of safety has been a personal commitment throughout my career. As the president of ALPA, the world's largest nongovernment aviation safety organization, I can tell you that all airline pilots share my dedication to advancing aviation safety and that safety has been the foundation of ALPA's work for more than 85 years. In fact, across town this week, we are hosting our 65th annual Air Safety Forum where we facilitate discussion between regulators, pilots and other safety experts and stakeholders on critical safety and security issues.

While aviation accidents are increasingly rare, ALPA has advocated and helped develop a forensic approach to accident investigation designed to identify every factor involved in an airline accident and develop corrective actions to address them, with the sole goal of preventing similar accidents from occurring in the future. In the U.S. airline industry, we collect data, evaluate it, identify mitigations, and implement them to make a safe system even safer.

Because of this commitment, ALPA is fully informed and involved in efforts to bring the Boeing 737 MAX safely back into service following the completion of the current U.S. Federal Aviation Administration (FAA) process. I have led our Air Safety Organization pilots and staff in contacting all appropriate regulatory authorities and stakeholders in the United States, Canada, and across the globe.

ALPA has offered our airline pilot perspective on the issues related to the accidents, including the process and procedures used to certify aircraft in the United States. We have been in communication with Boeing, the FAA, the National Transportation Safety Board, airlines, as well as with the U.S. Department of Transportation Special Committee.

So to the families and loved ones who are here today, I can assure you that the 62,000 pilots of ALPA resolve to be vigilant in ensuring that the Department of Transportation and the FAA make any and all changes necessary to enhance the safety of our air transportation system. You have my word.

OVERVIEW

Based on current statistics, 14 Code of Federal Regulations (CFR) Part 121 airlines carry approximately 900 million passengers and 18 million tons of cargo annually. U.S. passenger airlines operated under 14 CFR Part 121 have had one passenger fatality resulting from an accident since 2009. This safety record is due to the efforts of the aviation industry and our government partners but also due to the efforts of Congress and this Committee, in particular. During the 20 years prior to

the passage of the Aviation Safety and Federal Aviation Administration (FAA) Reauthorization Act of 2010, the U.S. passenger airline industry lost approximately 1,100 passengers in aircraft accidents. Since the passage of that bill there has not been a single passenger fatality due to "pilot error."

Strikingly, since 2009, there have been 93 fatal passenger airline accidents around the rest of world, which includes more than 4,700 fatalities. The United States passenger airline record is truly remarkable. For that reason, we believe that the most important work this Committee can accomplish is to ensure the United States maintains the highest safety levels in the world and continues to lead by example in all areas of aviation including aircraft certification, flight crew training and licensing, crew-duty and rest requirements, airport design standards, the safe introduction of new entrants, safety data analysis, and many other areas. This comprehensive safety mindset allows passengers to board a 14 CFR Part 121 passenger airline and know, with a very high degree of confidence , that they will get there safely. From day one in 1931, ALPA has maintained our motto of "schedule with safety." It hasn't changed; *safety is still our top priority*.

This Committee's continued focus on safety is to be commended, and we thank you for using your time and resources—including today—to shine a spotlight on safety. Unless we keep airline safety the top priority, we risk digression and an increase in accidents, which impact our ability to make progress on other important aspects of aviation such as investments in increasing airspace capacity and the introduction of new types of aviation and space operations into the National Airspace System.

FAA REAUTHORIZATION IMPLEMENTATION

In October 5, 2018, the Federal Aviation Administration Reauthorization Act of 2018 became law (P.L. 115-254). The members of this Committee demonstrated significant leadership to ensure that the legislation ultimately became law, and you are to be commended for your efforts to advance aviation safety. This law, if enacted appropriately and as Congress intended, will improve the air transportation system for years to come.

RETENTION OF CONGRESSIONALLY MANDATED FIRST OFFICER QUALIFICATIONS

In 2018, Congress retained the current airline pilot training and qualification requirements that are the law of the land. ALPA was pleased with both this Committee and Congress for making this life-saving, and wise decision. The best and most important safety feature of any airline operation is at least two skilled, well trained, fully qualified, highly experienced, and adequately rested professional flight crew members. With a solid foundation of training and experience, pilots are essential in maintaining the safety of our system and ensuring that aviation safety continues to advance. Several regional airline accidents from 2004 to 2009 identified numerous training and qualification deficiencies that ultimately led to Congressional action and regulatory changes that significantly improved airline safety. The last of these accidents occurred February 12, 2009, near Buffalo, N.Y. Fifty lives were lost—49 in the aircraft and one on the ground. This accident was a "watershed event" for the airline industry and aviation safety by resulting in regulations that enhanced pilot training, qualification, flight experience requirements, and the implementation of science-based flight, duty, and rest requirements.

The pilot training and qualifications regulations specifically require that all airline pilots flying under 14 CFR Part 121 must hold the air transport pilot (ATP) or Restricted ATP (R-ATP) certificate. The restricted R-ATP certificate pathway, can be obtained with fewer flight hours than the ATP, if the pilot applicant receives integrated academic and flight training from the military or an accredited aviation college or university.

Today's training and qualification regulations emphasize significantly greater focus on academics and instruction, areas of knowledge, and flight experience in various weather and operational situations. The rules also require a type rating in the aircraft to be flown for the airline if operated in 14 CFR Part 121 service and increased experience in multi-engine aircraft. among other numerous safety improvements. The FAA made a specific mention of the importance of academic training when it published the final rule, and how the accredited academics along with ground and flight training was necessary to qualify for a reduction in hours. We applaud this Committee for its leadership in preserving the training and qualifications requirements last year and urge you to continue to do so. We are confident that lives have been and are being saved because of your steadfastness on this issue.

SAFETY REGULATIONS VS. BAD AIRLINE ECONOMICS

Despite the clear message sent by Congress in 2018, there are some people and organizations who want to address business-related industry issues by reducing the requirements currently in place to obtain an ATP or a R-ATP. These changes would weaken the First Officer Qualification (FOQ) rules. They believe that rolling back provisions in P.L. 111-216 is the best way to fix their business challenges by widening the employment pool. We do not believe that those who are advocating for such measures are properly representing the issue of pilot availability, which is not pilot qualifications requirements, but an airline's attractiveness to the pilot community as an employer.

It is somewhat ironic that some who originally called for the changes in P.L. 111-216 have since become critical of the rules, arguing that the First Officer Qualifications have created a pilot shortage. Small communities which have experienced changes to the levels of airline services are also citing a pilot shortage. However, in both cases, there is no reliable data to support these positions and, in fact, the data says just the opposite.

In 2018, the FAA reported that it had issued 5,788 ATP certificates, which includes 1,762 R-ATP certificates. Our research revealed that the airlines hired approximately 4,600 pilots in 2018, which is considerably fewer than the number of pilots who became qualified to fly for the airlines that year. In fact, the number of ATP certificates issued by the FAA has been higher than the number of airline pilots hired for multiple years in a row. Clearly, the supply of pilots is currently keeping up with the demands. But we realize that as the industry expands, more pilots will be needed. ALPA continues to promote the pilot profession far and wide, as a career of choice for men and women who enjoy all the benefits that the career has to offer.

PILOT EXPERIENCE BEFORE AIRLINE FLYING IS CRITICAL

The length of time from when a pilot obtains his or her commercial pilots license to when they have accumulated the hours and flight experience necessary to qualify for the ATP or R-ATP certificate is measured in months, not years or decades. Pilots who graduate from an accredited, structured university and are qualified for the R-ATP pathway can currently expect to spend 12 months or less flying in entry level commercial operations or flight instruction before transitioning to an airline.

Some regional airlines would like pilots to come pre-programmed directly from a flight training environment that is directly similar to the flying environment of that specific carrier's, without having to make any training adjustments. While accredited universities produce pilots with the fundamental skills and knowledge to obtain a commercial pilot certificate, pilots who bring a more holistic, real-world set of skills, including training in a variety of weather, terrain, and air traffic control environments is beneficial. In our view, this versatility of experience far outweighs a small amount of airline training that is specified to mold the pilot into a single airline's operation.

It is important to note that airlines do not provide training to pilots (or allow them to take aircraft out to practice) so that they can obtain experience in factors such as weather (e.g., thunderstorms, snow, tropical storms), terrain (e.g., high altitude, mountain flying), and high-density air traffic (e.g., New York City and Los Angeles metroplex). Today's flight simulation environment cannot adequately replicate these factors. Therefore, it is critical for pilots to obtain flight time and experience in entry-level commercial operations after they have obtained the commercial pilots license, but before being inserted into the higher demands of 14 CFR Part 121 airline operating environment so they are equipped with real-world flying experience. The FAA wisely recognized that a military pilot background, or the combination of an accredited university, structured FAA approved flight training, and some commercial piloting experience in pre-airline commercial operations was the best and safest training pathway to fully address the shortcomings identified from fatal passenger airline accidents.

TAKING THE FIRST OFFICER QUALIFICATIONS REQUIREMENTS TO ICAO

Soon after Congress passed the FAA Reauthorization Act of 2018 without making changes to the first officer qualifications regulations, ALPA began to take stock of the training and experience requirements beyond our borders. In coordination with IFALPA, we have tracked pilot training and qualifications globally for years. It is clear that in nearly every other country, the training and minimum flight experience requirements to qualify as a flight crew member on a transport category airliner is less than the U.S., and in some cases, much less. And the non-U.S. global

accident rate shows that. Based on the safety record that the U.S. has achieved under the current training and qualifications framework, and knowing that global airline safety levels could be positively impacted by a review of the pilot training and qualification standards, ALPA recently asked ICAO Secretary General Fang Liu to evaluate the need for review of the global minimum training and qualifications.

In response, Secretary Liu called an ad-hoc meeting at ICAO to discuss this topic, which was held this month at ICAO headquarters in Montreal. The IFALPA attendees reported that the discussion was robust, and it is clear this issue will garner additional discussion at ICAO in the near future.

PROMOTING THE PROFESSION AND INCREASING DIVERSITY

ALPA continues to promote the airline pilot profession. This includes a team of ALPA pilots who promote the profession at several large aviation events including Women in Aviation; the Organization of Black Aerospace Professionals; AirVenture in Oshkosh, Wisconsin and the National Gay Pilots Association. Hundreds of ALPA pilots also promote the profession to students of all ages in thousands of schools nationwide. And for those college students who are in the midst of their flight training activities, we work alongside them, to help prepare them for their future airline career. You can see some of our work at www.clearedtodream.org.

All of these activities to promote the profession have included a focused effort to diversify the pilot community. This includes our efforts to reduce barriers to entry for minorities and women. We believe that there is no shortage of individuals who have the motivation, skills and aptitude to serve as airline pilots for a U.S. airline.

We were pleased to support provisions in the Aviation Safety and FAA Authorization Act of 2018 promoting women in aviation. We wholeheartedly applaud the leadership by this Committee to include that section, and we strongly support the establishment of a board that will be solely focused on women in aviation. We look forward to engaging on this topic with our fellow industry colleagues.

TWO PILOTS ARE NEEDED IN TODAY'S AIRLINE COCKPIT

The FAA Reauthorization importantly did *not* include a requirement for the FAA to establish a program related to the concept of single-pilot 14 CFR Part FAR 121 all-cargo airline operations. The program would have created a new multi-year funding obligation for the FAA to run a promotional program—despite, the agency's foundational safety mandate—in support of unsafe, single-piloted commercial operations. Upon learning about the proposal, ALPA took the initiative to measure public perception of the concept of a single pilot at the controls of an airline aircraft. In a public poll in 2018, 80 percent of respondents agreed that at least two pilots working together in the cockpit are best equipped to handle flight emergencies, while 96 percent said federal aviation research dollars should be directed at projects other than those aimed at eliminating pilots from the cockpit.

Even when the proposal for an FAA program was removed from the legislation, we continued to assess the feasibility of single pilot airline operations. In short, we documented many technical, regulatory, and financial barriers that indicate that single pilot operations are a non-starter either financially or due to safety and operational factors. Today, I am pleased to announce that ALPA has released a whitepaper on single pilot operations titled "The Dangers of Single-Pilot Operations," which is available on our website at www.alpa.org/whitepapers. We hope this paper will create a foundation from which ALPA can engage with anyone and everyone who would like to discuss this important topic with us.

Maintaining today's level of safety, security and efficiency is much more important than any dubious benefits of moving a pilot from the cockpit to a remote location. Further, the aviation industry's collective efforts to focus on higher priorities for the benefit of passengers and shippers, should not be distracted by the establishment of a federal program to evaluate or study this project at any agency or with any federal dollars.

ADDRESSING ALL-CARGO AIRLINE SAFETY

Many of the safety and security layers working to protect our passenger airline industry are absent from all-cargo operations. Cargo airlines fly the same aircraft, takeoff and land from the same airports, utilize the same airspace, and fly over the same cities as passenger aircraft. From a safety and security standpoint, there is every reason to hold all-cargo operations to the same safety and security standards as passenger operations. All-cargo airline operations currently experience an accident rate that is seven times higher than passenger airline operations worldwide.

While many of the same regulations are used for both commercial passenger and all-cargo airlines, there are lesser requirements placed on all-cargo operations in several very important areas, which result in unnecessary safety risk.

One example of this safety double standard between cargo and passenger operations is flight crew flight, duty, and rest regulations. While updated science-based flight- and duty-time regulations for passenger operations were issued in 2011 and implemented in 2014, those rules apply only to flight crew members at passenger airlines and do not include all-cargo pilots. The FAA's original rules were developed to include all pilots, passenger and cargo operations, but the cargo sector was removed at the 11th hour, a move that caught many by surprise. We believe that science-based flight, duty, and rest regulations must be developed for flight crew members of all-cargo operations.

Although there are other differences in all-cargo airline and passenger airline operations under 14 CFR Part 121, as discussed below, the correlation of reduced flight- and duty-time regulations and the tarnished safety record cannot be dismissed as a coincidence. With relatively few differences in the regulations between all-cargo and passenger airline operations, the differences in flight- and duty-time regulations are an obvious area that needs to be addressed.

However, unless we make meaningful changes soon, all-cargo airline operations will likely continue to have preventable accidents and fatalities at elevated levels relative to 14 CFR Part 121 passenger operation. Congress has a role to ensure that the disparity between all-cargo airline and passenger airline is eliminated. Accordingly, we request that this Committee take the necessary action to ensure that flight- and duty-time regulations, and other differences between all-cargo and passenger airline operations under 14 CFR Part 121 are resolved.

Another example of a significant safety gap is that all-cargo operations are exempted from Aircraft Rescue and Fire Fighting (ARFF) requirements contained in 14 CFR Part 139. This means that ARFF is not required to be staffed or even present at airports during operations of all-cargo aircraft.

Further, cargo aircraft carry very hazardous cargo, such as blood-borne pathogen, chemical, and radioactive material. Not only should ARFF be staffed during all-cargo operations, but ARFF personnel must be trained for dealing with fires on all-cargo airliners. Measures need to be developed and implemented that will properly prepare firefighters for dealing with a cargo aircraft fire. There is a lack of proper ARFF equipment needed to fight all-cargo aircraft fires at some airports, including nozzle tips designed for penetrating cargo airliner hulls, and a lack of funding, because the exemption of cargo from 14 CFR Part 139 requirements interferes with fire departments' ability to get the resources they need for staffing, equipment, training, and developing strategy for cargo-specific events.

ALPA has maintained a strong stance that all-cargo operations must have the same level of safety as passenger airlines. The facts, however, speak for themselves. There have been five (5) fatal all-cargo 14 CFR Part 121 accidents in the U.S. in the past decade, with 15 fatalities. This includes the fatal accident on February 23, 2019 of an Atlas Air Boeing 767, not far from Houston, Texas.

MISSING COCKPIT DOORS ON ALL-CARGO AIRCRAFT

After September 11, 2001, the federal government required existing and future passenger airliners and existing all-cargo airliners having cockpit doors, to be equipped with reinforced flight deck doors.

Today, however, a significant number of all-cargo airliners are still operated without the benefits of hardened flight deck doors, leaving them without a means of adequately separating the flight crew from personnel riding aft of the bulkhead, and potential cargo-hold stowaways. In fact, new wide-body cargo airplanes such as the B777 and the B767 are being built and delivered to all-cargo operators without the protections afforded by the reinforced door. The potential for a significant lapse in security due to these conditions is magnified by the fact that all-cargo airliners frequently carry third-party, non-crew personnel (known as "supernumeraries"), such as couriers and animal handlers, who are not subject to criminal history-based security background checks required of other airline employees. These animal handlers carry strong sedatives and syringes that can be used on the animals if necessary during flight. There is a significant concern by our members that these improperly-vetted individuals are able to use these sedatives or otherwise take hostile actions against the flight crew absent the protections of a primary door. This situation is exacerbated by the fact that all-cargo airliners and their cargo are not afforded the same security protections as their passenger-carrying counterparts while on the ground.

The lack of a mandate for reinforced flight deck doors on cargo aircraft is hard to justify when the TSA has formally stated that it considers the "hostile takeover of an all-cargo aircraft leading to its use as a weapon" to be a critical risk. Events in the post-9/11 era have proven that stowaways represent a very real and significant threat to all-cargo airliners. To deter those persons with malicious intent and impede their ability to attack all-cargo flight crewmembers, gain access to aircraft controls, or otherwise execute a hostile takeover of an all-cargo airliner, physical barriers must be designed and installed to separate the all-cargo airliner's flight deck from accessible passenger and cargo areas.

In order to ensure one level of security of all 14 CFR Part 121 operations, all-cargo flight decks must be clearly delineated and physically protected in the same fashion as the flight decks of passenger airliners. This includes the provision of reinforced flight deck doors and the associated flight deck access procedures for crewmembers.

SECONDARY BARRIERS DELAYED

Reinforced flight deck doors, mandated on passenger airliners by the U.S. Congress after the terrorist attacks of Sept. 11, 2001, do not provide a complete solution to the problem they were intended to resolve. There are times when operational necessity requires that the flight deck door be opened in flight. That period, however slight, represents a vulnerability that must be addressed. An installed physical secondary barrier, accompanied by standardized crew procedures for protecting the flight deck when the reinforced door is opened in flight, will significantly augment the intended benefits of the fortified door and other TSA-approved onboard protective measures, and add an important layer of security to prevent hostile takeover of the flight deck. ALPA has been calling for mandated secondary cockpit barriers for more than a decade.

At the behest of this Committee, section 336 of P.L. 115-254 requires "not later than 1 year after the date of the enactment of this Act, the Administrator of the Federal Aviation Administration shall issue an order requiring installation of a secondary cockpit barrier on each new aircraft that is manufactured for delivery to a passenger air carrier in the United States operating under the provisions of part 121 of title 14, Code of Federal Regulations."

However, with a deadline in 3 months, the FAA has inserted unnecessary roadblocks to stall progress on this important security provision. Last month, the agency tasked the Aviation Rulemaking Advisory Committee (ARAC), over ALPA's stated objections, with forming a working group to establish recommendations to the agency on the implementation of the Section 336 directive.

Clearly, this is a move to slow down or otherwise not fulfill the obligations Congress placed on the FAA to implement the secondary cockpit barrier mandate. We would note that 110 members of this body, including many members of this Committee, recently transmitted a letter [https://carson.house.gov/newsroom/press-releases/rep-carson-leads-effort-to-protect-planes-from-hijacking] to the DOT unequivocally reinforcing the statutory intent of Section 336: specifically, the FAA must issue an order, without delay, by October 5, 2019 requiring the installation of secondary barriers on all new manufactured passenger aircraft off the assembly line. Failing to meet this requirement will delay implementation and evade congressional intent.

Some may argue there are questions about how to implement the legislation. However, these questions were answered years ago by request from the FAA to RTCA—a private, not-for-profit corporation—to develop secondary barrier system guidelines containing design characteristics, minimum performance criteria, and installation and certification guidance.

RTCA Special Committee (SC)-221 developed and published these guidelines in September 2011 as DO-329. This document provides the FAA with guidance needed to develop and issue a clear interpretation of 14 CFR Part 121.584 to its principal operations inspectors as they evaluate an airline's security procedures for compliance. It also provides airlines and manufacturers with approved performance standards that are suitable for meeting FAA aircraft equipment requirements for the production and installation of secondary barriers.

We urge the Committee to continue to monitor this situation, and to ensure that the FAA carries out its requirements under the law and issue the requirement for secondary cockpit barriers by October 5, 2019.

SAFE SHIPMENTS OF HAZARDOUS MATERIALS

ALPA has long advocated for improved transport requirements for hazardous materials both as a member of IFALPA, and here in North America as well. We have worked with this Committee to ensure that the safe transport of lithium batteries

can occur with adequate risk mitigation techniques in place and are especially appreciative of Chairman DeFazio's longstanding commitment to improving the safety of lithium battery transport by air.

Although lithium batteries represent a significant technological improvement over older battery technology, their high energy density and flammability make these batteries more prone to failure, resulting in fire and explosion. The lack of comprehensive hazardous materials regulations for the carriage of lithium batteries as cargo onboard commercial aircraft, both passenger and cargo, continues to pose risks to air transportation.

New standards implemented by ICAO on April 1, 2016, made significant improvements to provisions under which lithium batteries are shipped as cargo by air around the globe. We are pleased that Section 333 of the FAA Reauthorization Act of 2018 directed the DOT to harmonize the U.S. regulations with those put in place by ICAO. This important and critical step ensures that until there are technologies that can fully contain a lithium battery induced fire, the shipments are limited.

While the harmonization of the US regulations to ICAO limitations is a good first step, it does not go far enough in addressing the safety risk created by lithium batteries. Work must continue to develop and mandate performance-based packaging standards that will prevent and/or contain a lithium battery fire. These standards must also address the threat from external fires.

UNDECLARED HAZARDOUS MATERIALS POSE A THREAT

We are pleased that undeclared hazardous materials were addressed by Section 583 of the FAA Reauthorization Act of 2018, which directs the Department of Transportation (DOT) to develop an undeclared hazardous materials public awareness campaign. The DOT's Pipeline and Hazardous Materials Safety Administration (PHMSA) has developed the 'Check the Box' educational program to begin to address the risks posed by undeclared hazardous materials shipments, as well as the FAA's program on undeclared hazardous materials. This is an important effort that should help raise awareness among shippers.

Hazardous materials, comprised of liquids, flammables, and other materials, shipped as cargo without being identified by the shipper are considered undeclared hazardous materials. There are no official estimates of what percentage of parcel shipments contain undeclared hazardous materials; however, the FAA tracks incidents where hazardous materials shipments create safety hazards for various reasons, such as a leaking package or other type of external evidence that the package is a safety concern. In 2018, the FAA received 1,346 reports of such events, and 644 of the incidents involved undeclared hazardous materials.

TRAINING WITH SIMULATION—THERE ARE LIMITS

As is well recognized, the U.S. airline pilot training standard is the gold standard, and significantly more advanced than most other countries. However, there are many airline business leaders who believe that they can manage training costs through innovative training methods. One such example is the expanded use of non-motion aircraft simulators. Ironically, non-motion simulators have been historically viewed as inferior due to their lack of ability to replicate the sense of flight that pilots experience as the operate the aircraft in all flight regimes. But non-movement simulators appear to be making a comeback.

While they may be acceptable to train pilots on checklist execution, or to help pilots learn the basic flow of cockpit procedures, there are some airlines that desire to begin to use non-movement simulators to evaluate pilots in training. The safety benefits of using simulation with full-motion are well documented and the use of motion-based simulation is mandated for some airline pilot training. We question the viability and benefit of re-introducing non-motion simulators for anything beyond basic initial aircraft cockpit orientation and procedures development.

Conversely, there are others who believe that nearly all the training needed to become an airline pilot can be conducted with motion-based simulation. They argue that a pilot's basic skills can be taught using carefully scripted "real world" scenarios to teach pilots basic knowledge and to leap-frog critical operating experience in the airspace system. An example of this simulation-based licensing scheme is an ICAO licensing option called the multi-crew pilots license, or MPL. Pilots flying for airlines with an MPL do not pass through the individual licensing levels such as the private pilot license, the instrument rating, the commercial pilot license, a multi-engine rating, high-altitude operations endorsement, etc. Instead, MPL pilots "hit the sim" on day number one of their training and within a very short time, without adequate real-world experience, they are placed into a transport category aircraft flying for an airline. They are essentially apprentice pilots, requiring the

captain to overcome any training and experience shortcomings that the first officer may have, alone.

From our view, both of these "extremes" need to be carefully monitored. Expanding the motion-based simulation technologies as a replacement for tried-and-true real-world flying is nearly impossible to achieve. And permitting airline pilot training and testing to be conducted with non-motion simulators will not give pilots the added benefits that have long been documented for a suitable training environment. We urge the committee to engage the FAA on these topics, and we stand at the ready to expand upon our concern in this area.

SAFE INTEGRATION OF UNMANNED AIRCRAFT SYSTEMS AND DRONES

ALPA applauds Congress for its clarification of the FAA's authority to fully regulate all Unmanned Aircraft Systems (UAS) operations in the 2018 FAA Reauthorization, to include model and hobby drone operators, who previously were exempted from regulation. We are especially grateful for this Subcommittee and Chairman DeFazio for the dedication to promote safe operations of all unmanned aircraft regardless of size, speed, or their intended purpose.

With the rapidly growing use of UAS for any number of applications and uses, the safety risks to airline operations need to be monitored very closely. We applaud this Committee's commitment to ensure UAS safety, by holding a hearing earlier this year that focused on aviation in 2050. Clearly, at some point in the future, UAS will be integrated into the national airspace system (NAS), interacting with other aircraft in a manner similar to "pilot on board" aircraft today.

Recently, a company approached the FAA to obtain exemptions that would allow them to bypass more than 200 regulations in order to start a commercial UAS package delivery service without any limitations to flying over residential or other populated areas.

Granting this petition for exemption would allow the petitioner to bypass the FAA UAS implementation policy of "crawl, walk, run" for the introduction of new technology, capability, and procedures. The FAA has historically established regulations based on accidents and incidents to establish the current FARs. Aviation regulations represent a safety framework for which commercial for-hire operations are conducted. Issuing exemptions to so many of the requested areas appears to erode the safety levels established by the FAA through regulation, many of which were established as a result of accidents and incidents with injury and loss of life to passengers and people on the ground.

As required under 14 CFR Part 11.35 (b), the FAA withheld proprietary company manuals and related material, including the petitioner's safety case justification. Therefore, many of the exemptions requested could not be thoroughly evaluated by industry stakeholders. If successful, we can anticipate that other manned and unmanned operators would seek similar exemptions from the same regulations included in this Petition for Exemption, awarding them to others without a clear safety justification. This is not how UAS operations should be implemented in the NAS if the objective is to make UAS a standard participant in routine NAS operations.

FAA appears to be struggling to keep pace with the expansion of the UAS industry. Issuing waivers to a multitude of regulations, with minimal input from existing airspace users, raises concerns about the amount of additional risk being introduced into the airspace system.

We must not allow pressure to rapidly integrate UAS into the NAS without appropriate safeguards in place. This process must be focused on safety as the highest priority. Risk mitigation plans, which have yet to be fully developed, combined with consensus-based technology standards that will ensure interoperability with manned aircraft, must be in place before a UAS can occupy the same airspace as manned aircraft or operate in areas where it might inadvertently stray into airspace occupied by airliners. When UAS operate in the same airspace as airline aircraft, the pilots will need to be able to see them on cockpit displays, and air traffic controllers will also need to see them on their displays to safely separate air traffic. Further, the UAS must be equipped with active collision-avoidance technology. We will oppose any integration that does not include collision avoidance systems that are interoperable with airline collision avoidance systems.

If a UAS operator does not intend to fly in the same airspace as airliners, then limitations that ensure that the UAS stays out of the airspace must be programmed into the UAS in a way that cannot be overridden.

sUAS Identification and Tracking Technologies are Needed

As has been widely reported, a drone collided with a U.S. Army helicopter in 2016, one mile east of Midland Beach in Staten Island, New York. From the investigation, we know that a Temporary Flight Restriction (TFR) was in effect for the

area of the flight, and that the UAS was not equipped with any type of identification or tracking technology. The National Transportation Safety Board examined pieces of the sUAS that were found lodged in the aircraft, and using the information from these pieces, the hobbyist pilot of the sUAS was identified and located. The individual operating the sUAS routinely operated his hobby aircraft in the vicinity of the collision site, which was beyond his visual line of sight. After losing control of the aircraft, and because it failed to return to his position, he indicated that he simply believed his aircraft had "gone down" and he was unaware that it had been involved in a mid-air collision.

Now that Congress has removed the FAA's barriers to regulating model and hobby small UAS, the FAA urgently needs to implement mandatory identification and tracking capabilities.

If an identification and tracking system had been in place prior to the October 2016 collision with the Army helicopter, much more information would have been immediately available to accident investigators and law enforcement. Such a system would likely have prevented the collision in the first place, because law enforcement may have observed the sUAS operating on a previous flight, and proactively contacted the hobbyist about the illegal use of the aircraft. Until there is a way for law enforcement to identify and track down the sUAS operators, there is very little incentive for non-conformist hobby operators to operate sUAS safely.

INTEGRATING COMMERCIAL SPACE OPERATIONS IMPROVES SAFETY

Commercial space operations are not new. In fact, it has been more than 30 years since Congress established the Office of Commercial Space Transportation in the DOT, which now resides at the FAA. The industry is mature, and thanks to a series of events over the past decade, it is thriving through an expansion in proposed spaceports and significantly increased operational frequency.

These are truly exciting times for America as we experience innovation and advancements that are literally blasting off before our eyes. However, we must continue to make commercial aviation part of the discussion on commercial space. Future growth and success of U.S. commercial aviation depends upon continued safe, dependable, and efficient access to shared public resources such as the National Airspace System, air traffic management, ground infrastructure, and airport services. The need to integrate commercial space operations and commercial aviation operations into the NAS is an urgent one that requires careful planning and commitment from many different parts of the industry.

One thing is clear: expanded markets and technology advances in space are enabling new commercial companies to access these limited resources, which has become a critical challenge for the aviation community. Air traffic management, airports, and the NAS are regulated and managed according to strict operational and safety regulations, which will not sufficiently accommodate the projected growth and evolution of space transportation, without enhancements to how space flight is accommodated by the NAS. There must be a means to safely integrate with existing aircraft operations and infrastructure without decreasing the level of safety or efficiency for existing operations. Full integration will allow space operations to plan and execute launches without extensive coordination like they do now, and full integration will also eliminate the need for segregation of space operations from commercial airline flights. Bottom line: commercial space integration improves safety and efficiency of the NAS for all airspace users. A strategy to fully integrate commercial space operations into existing NAS operations is a critical first step to achieving this important goal.

Neither industry would be successful today without the other. Each sector generates hundreds of billions of dollars in annual economic returns for the United States and immeasurable benefits to society. The FAA has coordinated the activities of both airplanes and rockets successfully for more than 60 years. In many ways, there is a false distinction between the two sectors, since several aircraft types travel into outer space, and all space vehicles travel through the atmosphere. As spaceflight becomes more diffuse and routine, both sectors must cooperate to create policies, regulations, and procedures to manage shared national aerospace resources safely and efficiently.

An important reason to keep the commercial space industry a part of the aviation discussion is that there are going to be innovations in safety and efficiency that will likely find their way into commercial aviation. For example, Virgin Galactic plans to utilize a spacecraft for multiple flights with paying passengers (technically speaking, they are "participants"), and this experience will likely help the commercial airlines better understand the interest in hypersonic travel and the potential issues that would accompany a transition to this type of travel in the future.

ALPA is very interested in supporting the commercial space industry's efforts to advance through the full integration into the NAS. To fully articulate the complementary nature of commercial space and commercial aviation, we published a white paper, "Addressing the Challenges to Aviation from Evolving Space Transportation" that documents the role of the government agencies and industry, both historically as well as today. That whitepaper can also be found at www.alpa.org/whitepapers.

SAFETY DATA ANALYSIS IS CRITICAL TO ENSURE RISKS ARE PROACTIVELY IDENTIFIED

When thinking about aviation advancements over the next several years, there is one aspect above all others that needs our full support in order to continue to improve: aviation safety. The efforts of the Commercial Aviation Safety Team (CAST) combined with Aviation Safety Information Analysis and Sharing (ASIAS) have led to dramatic improvements. Data analysis by CAST and ASIAS has resulted in a proactive safety culture that cuts across all airlines and stakeholders with unprecedented levels of collaboration, even when those same stakeholders disagree about many other aspects of industry policy. The predictive risk analysis conducted by the CAST and ASIAS allows the aviation community to collectively reach heightened levels of safety without waiting for a single drop of blood to be shed. We believe that the resource needs for the ASIAS activity are likely going to increase in order to keep up with the accelerated pace of operations. We urge Congress to closely monitor the resource requirements for this activity to ensure that critical safety risk identification activities are not tabled because of inadequate resources.

NECESSARY RESOURCES TO ENSURE SAFETY OF OUR SKIES

A safe airline industry is only possible when the FAA has the resources necessary to carry out its safety mission. The FAA needs to receive consistent and reliable funding for its safety oversight role, as well as its role as an air navigation service provider.

The partial government shutdown earlier this year has perhaps faded from the memories of most Americans. But the shutdown has not faded from the memories of ALPA pilots, who found themselves faced with new and different types of risks than they had experienced in the past. The FAA's rank and file air traffic controllers, ATC system safety specialists, certification engineers/specialists, and FAA safety inspectors as well as the Transportation Security Administration's (TSA) Transportation Security Officers were expected to do the unthinkable for multiple pay periods: work without pay. And while it may be no surprise to the members of this Committee, their service to this country during that period was phenomenal.

But the realities of work without pay started to set in quickly, and our airspace system was put at risk for no good reason whatsoever. Political gamesmanship put our national transportation system at risk. Fortunately, the system's safety net worked, and the shutdown ended without serious ramifications to air travel.

ALPA was pleased to be among the first to support Chairman DeFazio's legislation that will allow the FAA to temporarily use funds from the Airport and Airway Trust Fund during a government shutdown situation. The Aviation Funding Stability Act needs to be passed as soon as possible, and we continue to fully support the legislation.

The FAA is seemingly accustomed to being asked to do more, while not always receiving the funding that they need. The FAA oversight of aircraft certification and manufacturing, maintenance, airline certificate management should not be put in jeopardy because the FAA is now being tasked with the work of approving new types of operations in the NAS such as UAS, small drones, supersonic, hypersonic, and multi-rotor vertical lift operations. All of these "additional types of operations" require resources that are above and beyond those needed for safety oversight. Introduction of these new types of operations safely requires resources that the FAA likely does not yet possess. We urge the Committee to keep a close eye on the agency's needs.

The new types of operations the FAA must operationally approve as a safety regulator will also drive new demands on the air traffic control system. While the Next Generation Air Transportation System (NextGen) establishes a foundation for safely increasing capacity in our skies, the FAA will likely need to develop additional capabilities to support commercial space, UAS, and other new operations. The resources needed by the FAA will likely be significant. However, from the view of airline pilots, we will want air traffic controllers—as the shepherds of the skies—to have the tools they need to ensure our safe passage. To make sure they have the tools they need, Congress must ensure that the FAA has stable and reliable funding.

STRENGTHENING VOLUNTARY SAFETY REPORTING PROGRAMS

Voluntary safety reporting programs such as the Aviation Safety Action Program (ASAP) and Flight Operations Quality Assurance (FOQA) are important, collaborative tools that enhance aviation safety through the analysis of voluntarily reported safety events and discrepancies that lead to the prevention of accidents and incidents. The purpose of ASAP and FOQA is to encourage and use voluntarily reported safety information provided by frontline employees and airlines, respectively, to identify safety risks. Without these valuable safety reports, unidentified risks go unmitigated and remain within the system.

For example, more than a decade ago the implementation of stabilized approach technology and procedures became a top safety priority upon discovering the frequency of non-stabilized approaches being reported by pilots. More recently, data sources have been combined to identify potential risks that are initially identified through the voluntary safety programs. Ground radar data, historical weather information, and other data sources were used to identify instances when aircraft traffic and terrain warning systems were repeatedly alerting to false alarms. These voluntary safety programs triggered studies of these alarms, which ultimately led to the discovery that improvements to airspace and procedures design would reduce the false alarms. These examples prove that the underlying voluntary safety program reporting by the operators is the best source to identify potential risk areas and to investigate and ultimately mitigate these risks.

Automatic Acceptance

We were pleased to see that Section 320 of the FAA Reauthorization Act of 2018 included the provision that "there shall be a presumption that an individual's voluntary report of an operational or maintenance issue related to aviation safety under an aviation safety action program meets the criteria for acceptance as a valid report under such program." Directing the FAA to change ASAP programs to reflect this presumption will improve and increase the safety benefit of ASAP and voluntarily submitted aviation safety information by automatic acceptance of ASAP reports. Several airline ASAP programs already have automatic acceptance protocols built in (e.g., American and Delta Air Lines). However, where ASAP reports are not automatically accepted, the safety benefit is delayed, sometimes by weeks or longer, waiting for an Event Review Committee (ERC) to meet, review, and accept these reports. Under an automatic-acceptance scenario, the safety benefit of the information will be realized immediately. As recognized in Section 320, a report could still be ultimately excluded when the ERC convenes, and it is determined to meet established exclusionary criteria. The automatic-acceptance model works and will now be universal to ASAP, thanks to the work of this committee.

FAIR AND OPEN SKIES—ENSURING THAT AVIATION IN AMERICA REMAINS SAFE AND STRONG

ALPA would like to thank Chairman DeFazio and Chairman Larsen, as well as Representatives Davis, Davids and Ferguson, for their strong leadership on an important issue that threatens thousands of high-quality airline jobs in our country. On July 10th they introduced, H.R. 3632, the Fair and Open Skies Act. The legislation provides a bipartisan solution to ensure the enforcement of our Open Skies agreements by bolstering the DOT's oversight of an air carrier when it seeks an operating certificate to conduct service to the United States. Specifically, the Fair and Open Skies Act clarifies in statute that a multi-factor public interest test must be given consideration before the issuance of foreign air carrier permit, revises the public interest test to examine whether a foreign air carrier is a flag of convenience or is otherwise undermining U.S. labor standards, and requires European air carriers abide by the labor chapter of the U.S.-E.U. Open Skies Agreement as ratified by our government, ALPA has traditionally supported the opportunities created by our more than 120 Open Skies agreements. When properly enforced, these agreements promote benefits for U.S. carriers, workers, and passengers. Collectively, the reforms provided in the Fair and Open Skies Act will help ensure these agreements operate as intended and that the liberalization of air services is beneficial to all parties, including nation states, U.S. employees, and air carriers. This legislation will ensure that DOT gives proper consideration of a foreign airline's business practices—including those who may employ businesses practices with questionable safety oversight or regulatory schemes to be fully vetted before granting a permit to fly to the U.S.

CONCLUSION

We appreciate the Committee's invitation to offer our insights and perspectives on these important aviation safety issues today. More importantly, we appreciate the leadership that continues to be demonstrated by the Committee to advance these high-priority safety issues. The airline industry is best positioned to fully meet the needs of all passengers and shippers when safety levels remain at, or exceed, their current levels. It is in our collective best interest as legislative leaders, labor organizations, companies, and regulators, to ensure the foundation of safety is solid, and continues to lead the rest of the world. We look forward to working on these issues with you in the coming months as we strive to make meaningful safety improvements to aviation.

Mr. LARSEN. Thank you.

Ms. Bassani, you are recognized for 5 minutes.

Ms. BASSANI. Good morning, Chairman DeFazio, Chairman Larsen, Ranking Member Graves, and members of the Aviation Subcommittee. My name is Lori Bassani, and I am the president of the Association of Professional Flight Attendants.

First, I would like to extend my deepest condolences to Mr. Njoroge, Mr. Stumo, and all of the families who are impacted by the Ethiopian Air and Lion Air crashes. Your testimony was very compelling and heartfelt.

APFA represents over 28,000 flight attendants of American airlines and is the largest independent flight attendant union in the world. APFA is also a member of the Coalition of Flight Attendants, where labor organizations that represent virtually all U.S.-based flight attendants come together to promote aviation safety and our profession.

Today, I am proud to be the voice for the nearly 100,000 flight attendants across the Nation.

I know many of you on this committee travel each week and personally understand the challenges of air travel today. Believe me, we feel your frustrations.

As both first responders on board the aircraft and the last line of defense should the unthinkable happen again, your safety and security is our top priority.

The 2018 FAA reauthorization bill included many safety improvements that we are all eager to see implemented and that need the continuing oversight of this important committee. We applaud the passage of this bill with overwhelming bipartisan support. It is a genuine tribute to leadership of this committee and the importance of these issues.

There are several safety provisions I would like to speak to today.

First, in section 337, the FAA is instructed to review cabin evacuation procedures and the changes to passenger seating configurations.

Stop. In the time that I have been speaking, it has been 90 seconds. My crew would be charged with evacuating a full aircraft with 291 lives aboard. I hope that we saved all of those lives. But here are some of the ways that we can do this.

APFA has previously testified regarding our concerns on seat size, pitch, and our ability to evacuate an aircraft using just half of the exits in 90 seconds or less. This is the certification requirement mandated by the FAA.

The truth is that passengers are now older, some are larger, and sometimes less mobile. As seat size and legroom continue to shrink, frustrations rise. We are seeing unprecedented levels of air rage.

In an emergency landing, passengers no longer have enough space to assume the proper brace position. Under these conditions, is a 90-second evacuation still realistic?

APFA believes that a comprehensive review of evacuation procedures under real-world conditions is long overdue.

Second, the FAA recognizes that toxic fumes jeopardize flight safety but has no process to collect reports from crew and no procedures to investigate such incidents. This means that the true extent of toxic fume contamination remains largely unknown.

Last year, at our airline alone, 1,500 fume events were reported to our safety department. My members have been hospitalized and have suffered chronic and permanent neurological damage.

Section 326 of the FAA bill takes first steps in addressing this issue by requiring the collection data and providing educational information to crewmembers. The Cabin Air Safety Act, introduced this year by Congressman Garamendi, specifically mentions carbon monoxide detectors and takes the FAA bill a needed step further, and we urge its adoption.

Third, Congress amended the minimum flight attendant rest requirement from 8 to 10 hours. When Congress passed this legislation, the intent was clear: simply modify the 1994 rule relating to flight attendant rest within 30 days of passage. Sounds simple, makes common sense, but apparently not.

We are now hearing from the DOT and the FAA that it will take months to implement this modest change. Given the broad bipartisan support of this provision, we ask that the committee reengage and insist on its timely implementation.

Lastly, we want to thank the committee for your work providing oversight on the 737 MAX tragedies. When the aircraft regains flight status, we will be the ones in the aisles reassuring our passengers.

Flight attendants must have absolute confidence in the aircraft and in the process that will return it to service. We continue to look to you to ensure that that process is fully transparent.

As flight attendants, safety is in our DNA. On any given flight, on any given day, we can be called upon to attend to a heart attack victim, to fight fires, to avert security risks, to comfort a child traveling alone, to deescalate enraged passengers, identify sex traffickers, and deal with turbulence and delays, all while being prepared to evacuate a plane stuffed full of passengers at a moment's notice, within 90 seconds.

We need to know and be able to communicate to the traveling public, our guests, that we have and will continue to have the safest aviation system in the world.

Thank you. My testimony is now complete.

[Ms. Bassani's prepared statement follows:]

Prepared Statement of Lori Bassani, National President, Association of Professional Flight Attendants

Good morning Chairman DeFazio, Chairman Larsen, Ranking Member Graves and members of the Aviation Subcommittee. Thank you for inviting me to testify. My name is Lori Bassani. I am the National President of the Association of Professional Flight Attendants (APFA). APFA represents the more than 28,000 Flight Attendants of American Airlines and is the largest independent Flight Attendant union in the world. APFA is also a member of the Coalition of Flight Attendant Unions where the multiple labor organizations that represent virtually all US-based Flight Attendants work together to promote aviation safety and this profession. I am honored to be here speaking on behalf of our profession.

The issues that matter to Flight Attendants are the same ones that matter to passengers. I know many of you on this Committee travel each week and personally understand the many challenges of air travel today. While we represent more than 28,000 Flight Attendants, what we are fighting for is a safe and comfortable travel experience for all our passengers. As both first responders on board the aircraft and the last line of defense should the unthinkable happen again, safety and security are our top priority.

FAA OVERSIGHT

We were gratified when the 2018 FAA Reauthorization Act passed by this Committee, was signed into law in October and we applaud that it was passed with overwhelming bipartisan support—an increasingly rare occurrence in this town and a genuine tribute to leadership of this Committee, so I thank you Chairman DeFazio, Chairman Larsen, Ranking Member Graves as well as former Chairman Shuster. It is a testament to the importance of these issues.

There are safety provisions in the bill that we are all eager to see implemented, some of which are overdue and all of which need the continuing oversight of this Committee. We are tracking many components of the bill but there are several I would like to speak to today.

SEAT SIZE AND EVACUATIONS

Section 337 requires the FAA to broadly review cabin evacuation procedures and the changes to passenger seating configurations, including seat widths, pitch, leg room and aisle width. In light of recent accidents and incidents in which passengers have had to evacuate, it is important to review seat dimensions. At American Airlines, our Flight Attendants had to evacuate a Boeing 767 on the runway at O'Hare International Airport in Chicago in October of 2016. While everyone was evacuated safely, the process raised many questions. So simply put: it's time to seriously review evacuation procedures under current, real-world conditions.

In addition, every aspect of personal space, except first class and business class aboard commercial aircraft is shrinking. In the main cabin where most passengers fly, personal space is constrained more than it has ever been. Airplanes are flying at near capacity, and not just during the busy travel seasons. Airplanes are packed full. Air rage is on the rise. Flight Attendants are inevitably drawn into the conflicts. Finally, with 28 or 29 inch seat pitch, many passengers no longer have enough space to assume the proper "brace position" in the event of an emergency landing, let alone comfortably work on their laptops.

In order to be certified, a carrier must demonstrate to the FAA that an aircraft can be safely evacuated using just half of the exits in 90 seconds or less. The truth is that many passengers are older, larger and in many cases have less mobility. When these facts are combined with reduced seat pitch and size we believe a comprehensive review of evacuation procedures is overdue. Our understanding is that the FAA has yet to initiate any formal action on this Congressional instruction.

CABIN AIR QUALITY

While the FAA recognizes that toxic fumes jeopardize flight safety, the Agency has no standard process to collect reports from crew about fume events and no procedures to investigate such incidents. This means that the true extent of toxic fume contamination remains largely unknown and likely underreported. Last year alone, we had over 1500 fumes events reported to our union's Safety Department. My members have been hospitalized and have suffered chronic and permanent neurological damage. Once a fume event has injured a crewmember, we are forced to fight with our company and state laws to receive any type of workers' compensation which are routinely denied.

Section 326 of the FAA Bill takes important first steps in addressing this issue by collecting data and examining potential monitoring of the cabin air. Exposure to toxic fumes can be insidious. Passenger and crew can be largely unaware of their exposure until after the event. The bleed air system that is common in almost all commercial aircraft lends itself to feeding contaminated air into the cabin and ought to be at the center of any new investigation. We also support HR 2208 introduced by Rep. Garamendi which would mandate a much more specific course of action in investigating this problem and we look forward to supporting its passage. No one should ever have to question whether the air they breathe in the cabin of an aircraft is safe. Again, our focus is crew and passengers' health.

10-HOUR MINIMUM REST

In Section 335, Congress amended the minimum Flight Attendant rest requirement from 8 to 10 hours. We know that when Congress passed this legislation the intent was clear. Simply modify the final rule published in the Federal Register on August 19, 1994 relating to Flight Attendant duty period limitations and rest within 30 days to read as "*a flight attendant scheduled to a duty period of 14 hours or less is given a scheduled rest period of at least 10 consecutive hours; and the rest period is not reduced under any circumstances.*" Sounds simple, makes common sense, but apparently not. We are now hearing from the DOT and the FAA that it will take months to review and implement this modest change. Given the broad bipartisan support of this provision we would ask the Committee to reengage and order its timely implementation. Passengers deserve Flight Attendants who are well-rested and ready to respond at a moment's notice.

EMOTIONAL SUPPORT ANIMALS

Section 437 of the FAA Bill addresses emotional support animals and harmonizes service animal standards. We have seen a variety of animals including monkeys, chickens, pigs, a kangaroo, a miniature penguin and even a miniature pony all brought onto the aircraft under the guise of being "service" or "emotional support" animals. These so-called emotional support animals have been known to bite passengers and Flight Attendants, urinate, defecate, cause allergic reactions to neighboring passengers and in general be disruptive to the normal flight experience. Unregulated, these untrained animals present health and safety issues. To their credit, individual carriers are now moving to address the abuse of emotional support policies and we thank the Committee for its attention to this important matter. We doubt whether the carriers would have acted as they have without this Committee paying attention. Nobody wants passengers with legitimate and documented needs to have their trained, ADA-certified animals denied boarding. But anything short of proper regulation is unfair to other passengers and a disaster in the making.

737 MAX

Lastly, we want to thank the Committee for the work you have done providing oversight on the 737 MAX tragedies. As stakeholders we appreciate that you have ensured our input into the process is heard. Not a day goes by that passengers don't ask about the MAX. As Flight Attendants we know we are in a unique position and when the aircraft regains flight status we will be the ones in the aisles answering questions. We need to have complete confidence in the aircraft and in the process that returns it to service. We continue to look to you to ensure that that process is fully transparent.

CLOSING

On any given day we, can be called upon to provide medical care, fight fires, thwart security risks, provide comfort to a child traveling alone, deescalate a potential passenger conflict, explain weather delays or mechanical delays and so on, all the while being prepared to evacuate an aircraft at a moment's notice. Passengers look to us for reassurance in all of these difficult situations. Along with our flight deck, we want to know and be able to communicate to the traveling public that we have, and will continue to have, the safest aviation system in the world.

Thank you. My testimony is now complete.

Mr. LARSEN. Thank you.

I now recognize Mike Perrone for 5 minutes.

Mr. PERRONE. Thank you.

Chairman DeFazio, Chairman Larsen, Ranking Member Graves, and the members of the subcommittee, thank you for inviting me to testify on behalf of the Professional Aviation Safety Specialists to discuss the current state of aviation safety.

While the United States remains the world leader in aviation, PASS agrees with the subcommittee that it is time to examine all factors that influence aviation safety.

First of all, I would like to acknowledge the family members here today who lost their loved ones in the Ethiopian Airlines accident. On behalf of all members of PASS, I extend our deepest condolences to you and to the families of the Lion Air victims who also suffered great loss.

PASS represents approximately 11,000 FAA employees nationwide. These employees are the backbone of the aviation system. Technical operations employees install, maintain, support, and certify air traffic control equipment. Aviation safety inspectors, or ASIs, oversee and inspect commercial and general aviation.

PASS-represented employees also develop flight procedures, perform quality analysis of aviation systems used in air traffic control, and aid in building and restoring air traffic control facilities.

When I last appeared before the subcommittee, it was in the wake of the longest Government shutdown in U.S. history. ASIs and support personnel were furloughed and no longer providing safety oversight, while technicians, TSA agents, and others worked without pay. Layers of safety were being stripped away.

Unfortunately, we find ourselves approaching a similar situation without a funding agreement in sight. It is imperative to the integrity and safety of the National Airspace System that Congress and the White House work to avoid another shutdown.

The uncertainty of the current political environment also threatens the FAA's ability to attract and retain the highly skilled workforce that it requires. Staffing and training challenges have plagued the FAA for years.

Within air traffic, inadequate technician staffing at critical airports across the country remains a challenge, resulting in increased restoration times during an outage and more air traffic delays.

Staffing shortages can also put FAA employees at risk. The safety of the system starts with the safety of all FAA employees.

The agency does not even know how many employees are adequately needed to perform safety-critical work. For example, this committee saw fit to include in the provision of the 2018 FAA reauthorization directing the FAA to reexamine the ASI staffing model. However, it remains unclear when this work will be completed.

ASIs are vital to the FAA's certification processes that ensure aircraft and equipment that meet FAA airworthiness requirements. PASS-represented employees in flight standards issue certificates and approvals for commercial air carriers, repair stations, pilots, and others to operate in the NAS.

While the FAA inspectors are integral to the certification process, individuals and ODAs are often granted more authority to conduct certification functions traditionally performed by FAA inspectors. Designees are now performing more than 90 percent of the FAA certification activities, despite serious concerns by the inspector general and PASS that oversight is lacking.

While the delegation of this authority may be deeply integrated into the certification process, now is the time to make sure that the FAA is providing the proper oversight of the program to ensure its success moving forward.

Unfortunately, after the two tragic accidents that led to the grounding of the 737 MAX, and with the agency facing intense scrutiny, the FAA continues to rapidly expand the delegation program, further removing ASI oversight from the certification process.

PASS has urged the FAA to halt further expansion of delegation until the investigations relating to the 737 MAX are issued and would appreciate the committee's support on this matter.

This is but one example where risk is continually being introduced into the system that may not manifest itself for years to come.

I would also like to highlight the work performed overseas on U.S. aircraft at foreign repair stations.

Domestically, FAA inspectors perform unannounced inspections of repair facilities. However, foreign facilities receive announced inspections, giving those facilities advanced notice to ensure compliance before inspectors arrive. Foreign facilities should be subject to the same requirements as domestic repair stations.

No other technology will alter the makeup of our airspace like the integration of drones. With over 1 million drones registered, the agency is facing a new set of safety, staffing, and training challenges. As drones are now sharing airspace with manned aircraft, ASIs and aviation safety technicians are tasked with ensuring the safe operation and compliance with Federal regulations.

PASS fears that similar to the many other areas of aviation safety, FAA employees will be forced to oversee this booming industry without the proper guidance and training. It shouldn't take a tragedy before the agency recognizes and reconsiders this approach.

In closing, PASS emphasizes that the safety of our airspace starts and ends with the investments in the employees who oversee and maintain it. Anything short of that is simply gambling with aviation safety.

Thank you very much for the opportunity to testify on this important issue, and I look forward to any questions.

[Mr. Perrone's prepared statement follows:]

Prepared Statement of Michael Perrone, President, Professional Aviation Safety Specialists, AFL–CIO

Chairman Larsen, Ranking Member Graves, and members of the Subcommittee, thank you for inviting me to testify on behalf of the Professional Aviation Safety Specialists, AFL-CIO (PASS) to discuss the state of aviation safety in the United States.

PASS represents approximately 11,000 Federal Aviation Administration (FAA) and Department of Defense employees throughout the United States. PASS-represented employees in the FAA install, maintain, support and certify air traffic control and national defense equipment, inspect and oversee the commercial and general aviation industries, develop flight procedures, and perform quality analyses of complex aviation systems used in air traffic control and national defense in the United States and abroad. PASS members work to ensure the safety and efficiency of the aviation system that transports over 800 million passengers to their destination each year. The diversity of the PASS-represented workforce provides insight into the safety of the system they maintain and the industry they oversee. PASS

members are tasked with ensuring that the U.S. aviation system remains the safest in the world 24 hours a day, 7 days a week.

Following recent events related to the Boeing 737 MAX, including two fatal accidents overseas and the worldwide grounding of the aircraft, PASS agrees with the Subcommittee that this country must examine all factors that influence aviation safety. In support of that effort, the union presents the following detailed analysis of events and situations that we believe have introduced increased challenges and risk into the system. These are issues that must be addressed in order for the United States to maintain its reputation as the world leader in aviation safety.

AGENCY FUNDING AND GOVERNMENT SHUTDOWN

When PASS testified before this Subcommittee in February of this year, it was in the wake of the longest government shutdown in U.S. history. During the shutdown, aviation safety inspectors represented by PASS were furloughed, leading to a reduction in safety oversight, and FAA technicians worked without pay, which resulted in a lower employee morale and employees distracted by whether they would receive a paycheck.

According to the Congressional Budget Office (CBO), the 35-day partial government shutdown cost the U.S. economy $11 billion and that net discretionary funding for the agencies impacted by the shutdown—including the Department of Transportation (DOT)—totals $329 billion in fiscal year 2019, or about 25 percent of the total discretionary funding for the federal government.[1] The CBO could not precisely estimate the total workers furloughed during the shutdown since guidance issued by the Office of Personnel Management (OPM) changed, as was the case in relation to aviation safety inspectors and support personnel.[2]

At the onset of the shutdown, aviation safety inspectors in the Flight Standards Service and in Manufacturing Inspection District Offices (MIDOs) within the Aircraft Certification division were told not to report to work, essentially stripping away an entire layer of safety oversight. This meant that a number of tasks, including development of Next Generation Air Transportation System (NextGen) safety standards, aviation rulemaking and full range of air traffic oversight, were not being performed or were being performed at a reduced level. During a government shutdown, safety oversight can come to a virtual halt, leaving airlines and aircraft manufacturers, and repair stations to police themselves.

Support personnel were also furloughed for the duration of the shutdown while the backlog of paperwork grew and industry requests were delayed. Without these employees on the job every day, and with those at work worrying whether they will receive a paycheck, the aviation system is not prioritizing safety. While the government might not have been functioning at full capacity for 35 days, planes continued to fly and air traffic operations were needed despite there not being the proper level of safety.

The technicians in the FAA's Air Traffic Organization (ATO) represented by PASS were not furloughed during the shutdown. Instead, they did report to work every day without pay in order to fulfill their responsibility to the agency and the flying public. These employees—many of them military veterans—take their commitment to the United States very seriously and simply want to perform their jobs and be recognized for their dedication. When they go to work, they should only have to focus on the job of making sure equipment is properly maintained and certified, not whether their families are financially secure or when they will receive their next paycheck.

While legislation eventually made FAA employees impacted by the shutdown financially whole, the agency and many of these federal workers are still struggling to recover. This makes the current debate over spending agreements even more concerning. Without an agreement in sight, the threat of another government shutdown looms. Congress and the White House are showing no signs of settling the debate and avoiding a government shutdown this fall. PASS hears from many of our members their worry and concern over the situation, not only for themselves personally but for the overall safety of the aviation system. Aviation plays a critical role in today's economy and delivers invaluable services to the flying public and the military. The FAA is simply not operating at full potential during a shutdown. The flying public should not be subjected to unnecessary risk due to political disagreements. The situation must not be repeated.

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[1] Congressional Budget Office, "The Effects of the Partial Shutdown Ending in January 2019," p. 2, January 2019.

[2] Id., p. 3.

To that end, PASS supports H.R.1108, the "Aviation Funding Stability Act of 2019," introduced by Transportation and Infrastructure Committee Chair Peter DeFazio and Aviation Subcommittee Chair Rick Larsen. When it comes to aviation safety, any uncertainty introduces more risk into the system with the potential to ripple throughout the country. By drawing from the Airport and Airway Trust Fund (AATF) during any lapse in government appropriations, H.R.1108 would authorize the FAA to keep all programs running without interruption while all FAA employees would report to work without fear of missing their next paycheck. PASS encourages Congress to pass this legislation with urgency.

STAFFING AND TRAINING

PASS has long been drawing attention to the need for additional agency staffing and enhanced training. FAA employees are highly skilled individuals who often come to the agency from industry and many with significant military training. The current political environment and threat of another shutdown has not done anything to make the federal government a more attractive place to work. In fact, according to a CBO report, "funding lapses were probably beginning to reduce the credibility of the federal government as an employer and a contracting party, making it more difficult for federal agencies to attract and maintain a talented workforce and more expensive to enter into contracts with private firms."[3] This is no way to run the federal government; it is certainly no way to ensure attracting and maintaining the skilled workforce that PASS represents within the FAA.

There is little doubt that PASS and other FAA unions play a vital role in aviation safety. As such, these employees should be paid at compensation levels to ensure that the agency can recruit and retain qualified employees in order to fulfill such important safety responsibilities or else face the consequences. As evidence, during the shutdown, many PASS-represented employees indicated that they were looking for new jobs outside of the federal sector and many who came from industry have considered going back for higher pay. To maintain the current workforce and attract new employees to public service, the agency should consider starting salaries that are more competitive with the private sector and other incentives to recruit a new generation of highly skilled and dedicated workers. Recruiting and retaining properly skilled FAA employees can only offer the flying public further reassurances that the aviation system is safe and that ensuring that safety is the agency's top priority.

Unfortunately, in many instances, the agency does not even know how many employees are needed to adequately perform safety critical work. For example, this committee took input provided by PASS and saw fit to include a provision in the 2018 FAA reauthorization[4] directing the FAA to reexamine the aviation safety inspector staffing model. PASS agrees that this is necessary to properly determine the number of inspectors needed to protect the system and acknowledged the importance of this issue. However, it remains unclear when this work will be completed.

In addition, proper technician staffing at critical airports throughout the country remains a challenge. To be sure, hiring and training new technicians is not a quick or easy process. Inadequate technician staffing will no doubt result in increased restoration times during an outage and more air traffic delays. It can also make it difficult to ensure 24-hour safety coverage, a potentially dangerous situation that increases the risk of major air traffic issues. Airports across the country face many issues and technicians often work in difficult conditions as they must maintain thousands of pieces of equipment 365 days a year. For example, when a tower elevator was out of service at Los Angeles International Airport, a PASS-represented technician was tasked with climbing air traffic control equipment in the southern California heat for simple repairs. A routine task was quickly transformed into a dangerous and time-consuming undertaking that diverted efforts from other duties. The safety of the system starts with ensuring the safety of the employees who maintain it.

PASS consistently hears from members that training is a significant issue and that without proper training, increased risk to aviation safety is a real possibility. PASS learned that in some instances, management appears to feel that the systems are sophisticated enough and general training is acceptable rather than anything specific to one system or piece of equipment. For example, for over eight years with the agency, one PASS member has been assigned to oversee airships and other balloon-based aircraft. And yet, this member has never received balloon-specific training even though such focused training is usually provided in the industry. Many inspectors are assigned to oversee particular aircraft models but never given specific

[3] Id., p. 11.
[4] Public Law No.: 115-254.

training on those models. Emphasizing the concern regarding training is the fact that technology is changing every day. "General knowledge" of the work is simply not sufficient when it comes to aviation, we should expect these men and women to be experts at their craft. Training must be a priority throughout the agency in order to ensure these critical workers are fully familiar with and thoroughly skilled on the systems or equipment they encounter during duty hours to ensure they are maintained and certified to the highest safety standards.

CERTIFICATION AND THE DELEGATION PROGRAM

The FAA's certification process is a layered system intended to ensure aircraft and equipment meet FAA's airworthiness requirements, which are codified in the Federal Aviation Regulations (FARs). PASS-represented aviation safety inspectors in the FAA's Flight Standards Service division issue certificates and approvals for individuals and entities to operate in the National Airspace System (NAS), including commercial air carriers, repair stations, pilots and others. Inspectors within the MIDOs, which is part Aircraft Certification division, ensure that manufacturers comply with production certificates issued by the FAA.

While FAA inspectors and engineers are integral in the certification process, individual and organizational designees are often granted authority to verify compliance to specific portions of the federal regulations in the certification process and make findings of compliance in support of the type and production certificates through the Organization Designation Authorization (ODA) program. The ODA program is the means by which the FAA grants authority to organizations or companies. ODA holders are typically authorized to conduct the types of FAA functions that would normally be performed by the FAA. For delegated projects, FAA involvement is reduced based on the ability of the designees involved and their technical capabilities. As this program has proliferated, designees are now performing more than 90 percent of FAA's certification activities despite serious concerns that oversight is lacking.[5] This alone creates a concerning dynamic whereby designees who are paid by the aircraft manufacturers, airlines, or repair stations are simultaneously overseeing for the FAA.

Why allow individuals and companies outside the agency to perform work with the ability to impact the safety of the aviation system? The answer is so clear that the FAA even includes it on its website: "The FAA doesn't have the resources to do all the certification activities necessary to keep up with an expanding aviation industry."[6] If that is the case, then the least the agency can do is guarantee that there are enough inspectors to oversee the ODA program, yet they fail to achieve this baseline. Robust oversight of the delegation process is essential to ensure companies that use ODAs maintain the highest standards and comply with FAA safety regulations. Over the years, the DOT Office of the Inspector General has consistently identified management weaknesses with a number of FAA's oversight processes.[7] Aviation safety is the backbone of the entire aviation industry. Recent events have highlighted the ripple effect that a failure in safety oversight can have on the system not just here in the U.S., but worldwide.

The constant and rapidly expanding delegation of inspector duties—including bilateral delegation to foreign authorities—ultimately embeds risk into the system that is difficult to identify and quantify. It is also difficult to eliminate that risk once embedded. Unlike pilots who may achieve success by safely flying from point A to point B, impacts from the lack of safety oversight only manifest over time. In other words, simply reviewing the data from a delegated authority immediately after certification does not always produce the most accurate picture of aviation safety. The reaction can be delayed, and it can impact the system for years to come.

As previously highlighted, the accidents involving the Boeing 737 MAX and its subsequent grounding illustrate this level of embedded risk. Unfortunately, it took multiple tragic events for the flying public and the FAA to take a harder look at the delegation and ODA process. An issue that has been important to PASS for years, the delegation process goes to the core of aviation safety. While investigations are ongoing, what we do know is that the FAA delegated primary oversight of the MAX to Boeing—the company that would benefit the most from a quick approval process. While we await the results of the ongoing investigations surrounding the

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[5] United States Government Accountability Office, *Aviation Safety: FAA Efforts Have Improved Safety, but Challenges Remain in Key Areas*, April 16, 2013, p. 3.

[6] Federal Aviation Administration, "About the FAA Designee Program," modified January 31, 2019. Accessed July 10, 2019: https://www.faa.gov/other__visit/aviation__industry/designees__delegations/about/.

[7] Department of Transportation Office of Inspector General, *Perspectives on Overseeing the Safety of the U.S. Air Transportation System*, March 27, 2019, p. 6.

737 MAX, the FAA continues to move toward increased delegation and further removing FAA inspectors from the certification process. Simply put, the more the FAA reduces safety oversight of the certification process, the more risk is introduced. And, as the families of those lost due to the two Boeing 737 MAX accidents can no doubt tell you, mistakes and embedded risks can result in tragedies.

While the Boeing 737 MAX sits idle and several agencies conduct investigations into the failures surrounding the aircraft, we know there are questions that may never get answered. Based on the information we do have coupled with the number of unknowns, PASS has urged the FAA to halt further expansion of the delegation program until these reports are issued.[8] PASS stands by this request and asks for the committee's support on this matter. While the delegation program has become deeply integrated into the FAA's certification process, now is the time to ensure that it has the proper safety oversight and that the agency is allocating the proper staffing and resources to ensure its success moving forward.

Another area where risk is being unnecessarily introduced into the system occurs when work performed overseas on U.S. aircraft is not held to the same standards as work performed in this country. In a June 26, 2019, letter to DOT Secretary Elaine Chao, PASS joined the International Association of Machinists, Transport Workers Union and Transportation Trades Department, AFL-CIO, in calling on the secretary to fulfill obligations related to background investigations and drug and alcohol testing of foreign repair station workers who perform safety-sensitive work on U.S. aircraft. Additionally, oversight of the maintenance work is critical to ensuring the work is performed in accordance with FAA regulation and FAA-approved aircraft maintenance programs. Currently, FAA inspectors perform *unannounced*, periodic on-site inspections of domestic facilities to ensure compliance with important safety standards. However, FAA inspectors of foreign facilities are required to be *announced*, giving those facilities and its workers advanced notice and time to take necessary actions to regain compliance before the inspector arrives. It is long past the time for this gap to be closed. Foreign repair stations should be subject to the same standards and procedures, including unannounced inspections, as domestic repair facilities. This is something PASS has been endorsing for years, and the union would appreciate the support of this committee in relation to these efforts.

EMERGING TECHNOLOGIES AND NEW SAFETY CHALLENGES

The aviation industry is constantly evolving as new technology is being introduced at a record rate. This could not be more clearly displayed than through the growing Unmanned Aircraft Systems (UAS or drones) industry. As of July 2017, there were 879,696 registered UAS and over 21,000 UAS remote pilots.[9] And in January 2018, DOT Secretary Chao announced that the total number of drones now registered with the FAA is over one million.[10] That number has no doubt risen over the past 16 months. Furthermore, according to NextGov, the FAA predicts the commercial drone market will triple over the next five years.[11]

This technology is proof that the agency must address a number of issues previously mentioned as UAS will now be sharing the airspace with manned aircraft. If drones are expanding at such a rapid rate and aviation safety inspectors and aviation safety technicians are tasked with ensuring their safe operation, certainly increasing staffing and training of this workforce should be a priority. It is of crucial importance the FAA not let the mounting pressure from industry to rapidly integrate UAS into the NAS move forward without stringent safeguards in place. There is a significant lack of training when it comes to emerging technologies. For example, there is currently no UAS-related compliance and enforcement training on UAS for FAA aviation safety inspectors. The FAA must make it a priority to ensure the training is current and comprehensive.

With the advent of new entrants into the NAS, the FAA claims it is attempting a balanced approach that involves collaboration between government and industry, yet we have serious concerns about the lack of aviation safety inspector involvement. As the representative of the workforce tasked with ensuring regulatory com-

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[8] Professional Aviation Safety Specialists, AFL–CIO, Letter to Associate Administrator for Aviation Safety Ali Bahrami, May 13, 2019.

[9] Department of Transportation, *Federal Aviation Administration, Aviation Safety Workforce Plan 2017–2026*, pp. 46–47, 2017.

[10] Department of Transportation, "FAA Drone Registry Tops One Million," updated January 10, 2018. Accessed July 9, 2019: https://www.transportation.gov/briefing-room/faa-drone-registry-tops-one-million.

[11] Corrigan, Jack, "FAA Predicts the Commercial Drone Market Will Triple by 2023," NextGov, May 3, 2019. Accessed July 9, 2019: https://www.nextgov.com/emerging-tech/2019/05/faa-predicts-commercial-drone-market-will-triple-2023/156743/.

pliance, PASS has almost no voice in the conversation regarding integration. This is glaringly highlighted on the Drone Advisory Committee (DAC), which was formed in 2016. While it claims to be a collaborative working group with a diverse membership, PASS has serious concerns about the lack of regulatory representation. For example, PASS's application for membership was denied without justification or comment while the committee is heavily composed of drone operators and other industry representatives. PASS fears that, similar to many other areas of aviation safety, FAA employees will be forced to oversee this booming industry without the proper guidance and training and it will take a tragedy before the agency reconsiders its approach.

The agency will no doubt claim that its safety risk management systems, including the Safety Management System (SMS), of which the Safety Assurance System (SAS) is a key component, are sufficient for addressing and prioritizing risk. While SAS is a key tool for the aviation safety inspector workforce, PASS believes oversight is significantly hindered by inherent limitations of these internal systems. SAS allows FAA inspectors to collect data as a part of their oversight functions and enter this data into the program that then identifies safety issues and assists in assessing risk. Yet, the DOT Inspector General found that the FAA's UAS oversight was neither data-driven nor proactive and lacked key elements of a risk-based oversight system.[12]

Currently, FAA safety inspectors are experiencing problems with SAS that restrict their ability to accurately and completely assess risk. For example, SAS language often does not reflect safety oversight regulations and can conflict with written certification guidance. Inspectors input data using the program's unique automated prompts that limit the depth of detail and quality of information collected by the system. In a risk-based system, this is not only unacceptable but also completely avoidable. Safety critical maintenance procedures for aircraft are increasingly complex, and inspectors must have an in-depth understanding of them to recognize whether safety regulations are being followed. The agency needs to collaborate with the workforce to ensure that that aviation safety inspectors are equipped with the best tools to uphold the safety of the world's most complex aviation system—a system that only grows in complexity by the day.

CLOSING

As you are all aware, aviation plays a critical role in today's economy and delivers invaluable services to the flying public and military. However, those services will face scrutiny if aviation safety is questioned. The aforementioned areas are essential to ensuring continued safety of U.S. airspace and aircraft operating in this country and, in particular cases, abroad. PASS calls on this committee to consider our areas of concern and recognize the critical contributions made by the employees we represent. As always, we stand ready to work with you to ensure that the United States remains the safest aviation system in the world.

Mr. LARSEN. Thank you.

I will now recognize Mr. Samuelsen for 5 minutes.

Mr. SAMUELSEN. OK. Thank you.

And thank you, Chairman DeFazio, Chairman Larsen, and Ranking Member Graves for holding this hearing today.

My name is John Samuelsen, international president of the Transport Workers Union, representing over 150,000 members in the U.S.A. and the Caribbean.

In the aviation industry, our members work as mechanics, flight attendants, ramp workers, pilot instructors, airline dispatchers, and fleet service workers. Frontline aviation workers are responsible for maintaining our air safety and security system. We often have the best view of airline safety gaps. So giving all of us the opportunity to share our experience and recommendations is very important.

Today I would like to highlight two important safety issues. Legally, the FAA requires that all U.S.-flagged commercial aircraft be

[12] Department of Transportation Office of Inspector General, *Perspectives on Overseeing the Safety of the U.S. Air Transportation System*, March 27, 2019, p. 11.

maintained to the same standard. However, the FAA has actually exempted maintenance work done outside the United States from many safety standards. The result is now a two-tier safety system that encourages airlines to offshore more and more work, introducing more and more risk into our aviation system.

Foreign repair stations are exempt from regulations requiring mandatory security and background checks for workers, risk-based safety and security evaluations for facilities, drug and alcohol testing, unannounced FAA inspections, and FAA certification standards for mechanics and technicians.

Congress has already directed the FAA and the DOT to address several of these safety gaps twice in the past decade. Compliance with these mandates are years overdue.

FAA delays led to a boom for foreign repair stations. The number of these facilities has grown by more than 30 percent in just the past 4 years. There are now more than 900 FAA-certified foreign repair stations, including 200 that have been approved since 2017.

The amount of maintenance work being performed at these stations with lower safety standards is already extremely high, with coordinated efforts underway right now to increase those numbers.

DOT data shows that the three leading U.S. airlines all sent about 30 percent of their maintenance work to foreign facilities.

U.S. mechanics, technicians, and pilots are increasingly alarmed by the incompetent work and often nefarious actions performed on aircraft outside of the United States of America. Their discoveries have included critical engine components held together with tape and wire, mid-flight cabin depressurization caused by incorrectly installed exterior door parts, aircraft covered with flammable paint, drug smuggling in aircraft noses, wheel wells, avionics, and lavatory panels.

The country with the most FAA-certified foreign repair stations is China, and that represents significant cyber and other security questions.

This unlevel playing field for safety regulations is also costing American jobs. More than 8,200 aircraft maintenance jobs left the country in recent years. The job loss is caused by regulatory loopholes that allow airlines to cut costs by diminishing safety.

We often hear that airlines do not compete on safety, but right now that is what they are doing. Congress and the administration have to live up to this ideal by immediately closing all the loopholes that encourage moving this important maintenance work outside of the country.

I would also like to highlight another problem, which was touched on by President Bassani, and that is cabin air quality. The atmosphere surrounding aircraft at 40,000 feet above sea level is too thin to breathe. So modern aircraft heat air from around the wings and over the engines and then compress that air before circulating it into the cabin.

These nerve agents are absorbed by both inhalation and through the skin. Repeated or prolonged exposure to these agents, like that endured every day by flight attendants and frequent air travelers, can have devastating health effects.

These incidents are being reported more and more often now because of rising public awareness and because of trade union advo-

cacy. Just 3 days ago, a commercial plane made an emergency landing because of a fume event that made passengers and crew alike sick.

Aircraft aren't even equipped with sensors to alert the crew when fume events are occurring. This makes reporting and responding to these events extremely difficult.

I want to say thanks to Representatives John Garamendi and Pete Stauber for introducing the Cabin Air Safety Act. It directly addresses the health and safety concerns presented by these toxic fume events. The TWU fully endorses this legislation, and we hope the committee will take action on it soon.

Thank you very much for the opportunity to testify. Again, looking forward to questions.

[Mr. Samuelsen's prepared statement follows:]

Prepared Statement of John Samuelsen, International President, Transport Workers of America

Chairman Larsen, Ranking Member Graves and distinguished members of the House Subcommittee on Aviation, thank you very much for holding this hearing on aviation safety and for providing the Transport Workers Union (TWU) the opportunity to present testimony on issues of vital concern to the American people. Air safety is essential to our economy and no one knows more about the safety and security of our aviation system than the frontline employees who work in it every day.

My name is John Samuelsen and I am the International President of the Transport Workers Union of America. The TWU represents 151,000 members across the U.S. and I am here today representing those employed in the aviation industry as mechanics, flight attendants, ramp workers, airline dispatchers, and fleet service workers. For decades, the TWU has been at the forefront of efforts to increase the level of safety in the aviation industry for the protection of airline workers, as well as the travelling public. Our members continue to be devoted to creating and maintaining the safest aviation system possible.

I appreciate the opportunity to address this committee today and to share our concerns about several ongoing issues which threaten the safety and security of our airspace.

FOREIGN REPAIR AND MAINTENANCE FACILITIES

The TWU continues to have grave concerns regarding the outsourcing of aircraft maintenance to foreign repair facilities. In theory, the FAA requires that all U.S.-flagged commercial aircraft be maintained to the same standard, whether maintenance work is performed in-house or outsourced and regardless of whether the work is done in the U.S. or abroad. In reality, our regulatory structure has created a second, inferior set of safety standards for aircraft maintained outside of the United States.

While international air commerce requires qualified mechanics and technicians to be available around the globe, regulatory loopholes have created a second tier of safety requirements. This two-tier system is driving U.S. airlines to offshore a significant amount of their maintenance and repair operations because the lower safety standard abroad is cheaper. Insufficient safety regulations, fewer government inspections, and lower minimum qualifications for maintenance workers drive down the cost to the airlines. Because of this structural incentive, we are now seeing the foreign maintenance industry boom at the expense of jobs and safety here in the U.S.

More than 900 overseas aircraft maintenance and repair stations have been certified by the Federal Aviation Administration (FAA) in 65 countries around the world. The number of these facilities has grown by more than 30 percent in just the past four years. These foreign repair stations are located across the globe, including, for example: China (78), Singapore (54), Brazil (22), Thailand (6), Costa Rica (3), and El Salvador (2).

Thailand and Costa Rica are particularly interesting locations for these repair facilities. These countries' air safety regimes are classified as "category 2" by the FAA—meaning our government does not have confidence in their regulators to guarantee that regulations in these countries meet international safety standards. In the

case of Thailand, this designation was reviewed and renewed in February of this year when the Civil Aviation Authority of Thailand failed on 26 different metrics essential to aviation safety.

Thai and Costa Rican airlines are not allowed to initiate new service to the U.S. or to enter into codeshare agreements with U.S. carriers because we cannot certify that they are capable of adequately overseeing their aviation system. Inexplicably, despite this fact, our government continues to allow maintenance of U.S.-flagged aircraft in facilities whose day-to-day operations are overseen exclusively by these governments.

El Salvador is another interesting example. Despite currently having zero commercial flights to the United States, U.S. airlines regularly ferry empty planes to El Salvador for maintenance and repairs. This naked pursuit of a separate safety standard should give regulators and the travelling public pause.

The amount of maintenance being performed on this lower safety standard is already at worryingly high levels. While a lack of consistency in reporting methods makes it difficult to determine exactly how much maintenance and repair work is being outsourced, data from the U.S. Department of Transportation (DOT) shows that, in 2018, the three leading U.S. airlines—American, Delta, and United—consigned 31%, 30%, and 28% (based on dollars spent) of their maintenance work, respectively, to foreign facilities. Frontier Airlines reportedly outsourced 50% of its maintenance work.

More than 8,200 aircraft maintenance jobs have been moved abroad since the early 2000s. The loss of these high quality, middle class jobs should be disturbing in itself. But the additional safety concerns created by moving aircraft repair and maintenance to often unqualified, uncertified, uninspected foreign workers raise significant issues with the existing public policies which are enabling this regime. The dedication, skill, and professionalism of FAA-certified U.S. mechanics and technicians has been a major factor in creating the stellar safety record of U.S. airlines. The decreasing use of this labor force in favor of cheaper, less skilled workers has a consequential increase in risk for our air safety system.

American mechanics, technicians, and pilots are regularly alarmed by egregious examples of incompetent work performed on and nefarious modifications made to aircraft maintained outside of the U.S. Their discoveries have included:

- Critical engine components held together with tape and wire;
- Parts on the aircraft exterior doors installed incorrectly, leading to mid-flight cabin depressurization;
- Aircraft covered with flammable paint; and
- Drug smuggling in aircraft noses, wheel wells, avionics, and lavatory panels.

That U.S.-flagged aircraft are flying in these conditions is only possible because sovereign laws allow foreign repair stations to remain exempt from the vast majority of regulations governing U.S. facilities, including those requiring:

- Mandatory security background checks for workers;
- Risk-based safety and security evaluations for facilities;
- Employee drug and alcohol testing;
- Unannounced FAA inspections; and
- FAA certification standards for mechanics and technicians.

Congress has directed the FAA and the DOT to address these safety gaps several times over the past decade. The TWU fully supports existing statutory requirements directing our regulators to close these gaps—requirements which are now years overdue. In late June of this year, the TWU, in conjunction with several other unions, wrote to Transportation Secretary Chao, imploring her to act immediately on these directives.

Since 1991, all mechanics at U.S. aircraft repair stations have be subject to federally mandated testing as a condition of employment. The 2012 FAA Reauthorization Act directed the FAA to issue a proposed rule mandating that all repair station employees responsible for safety-sensitive maintenance on U.S. aircraft be subject to an alcohol and controlled substance testing program no later than February 14, 2013. An advanced notice of proposed rulemaking was issued by the Obama Administration in 2014 and the 2016 FAA Extension Act also included another requirement for the FAA to issue a proposed drug and alcohol testing rule within 90 days of enactment and a final rule within one year. To date, no such rule has been enacted.

The 2016 FAA Extension Act also required that, within six months of enactment, the FAA would guarantee that all workers at foreign repair stations who perform safety-sensitive work undergo a pre-employment background check to ensure that they are not a threat to aviation safety. Minimizing risks to airline passengers and crew must be our highest priority. As aircraft systems increase the amount of software and interconnectivity, they become more vulnerable to dangerous cyber at-

tacks. By allowing workers at foreign repair stations access to these aircraft systems without having been vetted through extensive background checks, we are recklessly exposing our skies to an increased number of serious security hazards. Workers at U.S. repair facilities are subject to background checks and it only makes sense that workers at overseas stations should be as well.

In addition, the 2016 bill required the FAA to increase risk-based safety oversight of foreign repair stations with demonstrated records of poor performance. A key element to this provision is the requirement that airlines report data to the FAA related to the seriousness and frequency of corrective measures undertaken as a result of substandard work performed at overseas repair facilities. Distressingly, this mandate has yet to be implemented either.

Simply put, the FAA is failing to exercise the minimum oversight mandated by Congress and necessary to protect the flying public. The recent, tragic crashes of two Boeing 737 Max aircraft demonstrate the consequences of negligence on behalf of our air safety regulator. For years, the FAA has allowed companies like Boeing to self-certify components of their aircraft designs without the oversight necessary to ensure this self-certification was meeting minimum standards. The TWU is concerned that the FAA's indifferent approach to aircraft type certification is being replicated in their oversight of foreign repair stations—potentially opening our air safety system up to other systemic failures in the future.

Our safety regulators must do a better job on all fronts. The FAA must properly regulate foreign repair stations—including conducting unannounced inspections and ensuring a minimum set of qualifications for the workers repairing our flagged fleet.

The TWU supports these commonsense directives contained in previous FAA Reauthorization bills, as well as all efforts to improve safety in the aviation industry. We thank this committee for acting on a bipartisan basis to move the FAA to take these necessary actions.

FLAGS OF CONVENIENCE AIRLINE LEGISLATION

The TWU supports H.R. 3632, the Fair and Open Skies Act, which was introduced last week by Representatives Peter DeFazio, Rick Larsen, Rodney Davis, Sharice Davids, and Drew Ferguson. This act would require the U.S. Department of Transportation to exercise more scrutiny prior to issuing foreign air carrier permits to flag of convenience carriers. Flag of convenience airlines split pieces of their operations across several countries in order to skirt tax, labor, and safety regulations in their home countries. These airlines present a long-term threat to the safety of our air system.

As we have witnessed in the maritime shipping industry, where the flag-of-convenience business model predominates, companies will seek a minimum safety standard if allowed to compete on safety. These companies destroy safety cultures by threatening their employees with retribution should they decline to utilize unsafe machinery—a practice which is only possible due to forum shopping for the very lowest labor and safety standards around the world. Even when the minimum international standards are violated by these companies, there is little chance that they will face any consequences because they effectively report to no government regulator. This business model will cause a race to the bottom in all our existing standards, which puts both crews and passengers at great risk.

The TWU strongly supports the Fair and Open Skies Act in order to enhance the safety of the travelling public.

CABIN AIR SAFETY

The TWU is also concerned about the quality of the air in our aircraft cabins. In order to create breathable air at 40,000 feet above sea level, aircraft pull air from the surrounding atmosphere, heat it over the engines, and compress it before circulating this air into the cabin. This process of "bleeding" air from around the plane has enabled modern jet travel; however, when the mechanical pieces of this process malfunction, cabin air can become toxic and extremely harmful to both passengers and crew members. The fact that our aircraft currently are not equipped to monitor cabin air quality is of great concern.

Engine oil, hydraulic fuel, and other aircraft fluids, when gasified, become potent nerve agents that can cause respiratory, neurological, and psychiatric symptoms as well as cancer. These nerve agents can be absorbed both by inhalation and through the skin. Repeated or prolonged exposure to these agents—such as that endured by flight attendants—can have devastating effects. Concern about toxic exposure in aircraft cabins is not theoretical or abstract. We have documented cases of TWU flight attendants who have suffered severe and career-ending disabilities due to this chemical exposure.

Passengers are at equal risk to the negative health effects from these fumes caused by bleed air. Because these fumes can smell like dirty socks or other everyday items, travelers may not recognize the health threat as it is happening. Some passengers mistake the symptoms of toxic fume exposure for jetlag. Recently, however, there has been a spate of incidents in which air travelers have become severely ill due to toxic cabin air, including on board aircraft on which TWU members served as crew. For example, eight passengers on a recent flight were hospitalized after one such event while waiting to take off.

Federal legislation recently introduced in Congress addresses the serious issue of bleed air. The Cabin Air Safety Act, H.R. 2208, sponsored by Representative John Garamendi, will help ensure that the air we breathe when we fly is healthy and safe. The TWU fully endorses this important bill.

10-HOUR REST FOR FLIGHT ATTENDANTS

Last year, Congress recognized the importance of establishing a 10-hour minimum rest period for flight attendants between shifts by directing the DOT to change the existing regulations as part of the 2018 FAA Reauthorization bill. The deadline for implementing this rule change passed in December without any action taken by the Department of Transportation.

Flight attendants are safety professionals who are responsible for ensuring the well-being of passengers throughout their flights. The flying public expects and relies on flight attendants to act with the highest level of professionalism, especially in cases of emergency. Adequate rest is essential to their performing their crucial duties to the highest standards. The 10-hour minimum rest rule will help ensure that the passengers are served by well-rested workers ready to react immediately to safety threats. We thank the members of this committee for their bipartisan efforts to implement this important safety improvement.

NATIONAL IN-FLIGHT SEXUAL MISCONDUCT TASK FORCE

Safety onboard our aircraft requires passengers and cabin crew to be confident they will not be harassed during a flight. The TWU applauds the bipartisan efforts of this committee to direct the Department of Transportation to establish the National In-Flight Sexual Misconduct Task Force, pursuant to the FAA Reauthorization Act of 2018. The task force is charged with reviewing and evaluating U.S. airlines' current policies and procedures for responding to and reporting passengers' allegations of sexual misconduct onboard commercial aircraft. Their report, complete with recommendations on best practices for training, reporting, and data collection related to sexual misconduct on the part of airline passengers, is due to Congress later this year.

TWU Local 556 President Lyn Montgomery is representing flight attendants on the task force. Ms. Montgomery's insights as a frontline employee representing workers responsible for maintaining a safe cabin will be essential for the task force to meaningfully address sexual assault and misconduct onboard our aircraft.

Flight attendants are safety critical workers. Passengers interfering with their operations, including through sexual misconduct, is illegal. However, TWU's members report that incidents involving passengers harassing flight attendants are an ever-present threat onboard our aircraft. These incidents distract our workers from their mission and pose serious safety threats. The TWU believes that any final report from the task force that does not address passenger-on-flight attendant misconduct would be incomplete.

CONCLUSION

I greatly appreciate the opportunity to testify before the committee on these important aviation industry issues. The TWU looks forward to working with the committee to advance policies that will improve aviation safety and health for airline passengers and crew members.

Mr. LARSEN. Thank you, President Samuelsen.

Thank everyone for your testimony today.

We are going to move now to Member questions. Each Member will be recognized for 5 minutes, and I will start by recognizing myself for 5 minutes. My first question is for Ms. Schulze of the NTSB.

With regards to emerging technologies and the need for growing expertise at the NTSB to match the use of the airspace, does NTSB

have a plan to develop that expertise? And if not, what is your plan to develop a plan for that expertise?

Ms. SCHULZE. Well, thank you for your question, Chairman Larsen.

We do have a plan with regard to the drones in the airspace, in the National Airspace System. We have, since our first investigation of a drone accident back in 2006, been looking at this issue very seriously. We recognized at that time that this new segment of the industry was coming.

In 2010, we actually changed our regulation to address unmanned aircraft systems in our rule. We added UAS accident in our accident definition, in our regulation. And then shortly thereafter, we also issued guidance to the industry for reporting standards, to help them understand what is reportable to us.

And so we have also continued along that line by having a specialist identified, an expert internally within our organization, who has helped us develop our investigative protocols for investigating drone accidents.

As I mentioned, in 2016 we investigated our first drone mid-air collision with an aircraft, a helicopter, over New York City—I am sorry—near Staten Island. And so we are very interested and very engaged in that technology, and we do appreciate the committee's support in helping us get there.

Mr. LARSEN. Yeah. And the investigation protocol, is it drone on anything or is it drone on aircraft, aircraft on drone? Or is it drone on drone?

Ms. SCHULZE. So our reporting standard——

Mr. LARSEN. What do you care——

Ms. SCHULZE. That is a very good question.

We do not investigate hobbyists. So we are looking more—we are focused more on those operators who are certified under one of the FAA requirements.

But in terms of our accident definition, any UAS accident involved that would result in a serious injury would be considered an accident, no matter what the size of the drone. If there is not an injury involved but there is substantial damage, it is for drones that are 300 pounds or greater.

Mr. LARSEN. Maybe have further questions later.

President Perrone, there is an ongoing debate on whether the FAA is adequately including aviation safety inspectors in the certification process, particularly those overseeing ODA.

How do safety inspector staffing challenges impact your members currently, and then the traveling public as well?

Mr. PERRONE. So the problem that we have, PASS believes that the FAA doesn't have enough inspectors. They don't have the staffing and also training to keep up with it. The ODA program is expanding, like I said, more than the FAA can handle it.

And we just want the FAA to be able to understand, they need to have the oversight available. We understand industry has the expertise. They are going to do what they need to do. But the bottom line for FAA, the regulatory side of the house, they have to have enough inspectors with the knowledge to understand what is going on. And if they are going to sign off on the ODA program, they have to be there.

The FAA's position right now is they are data collectors. So our inspectors used to go out, kick the tires, visit the aircraft industry, and see and have a rapport with the industry as well as the folks working on the equipment.

They have changed that philosophy. They have and rely on the industry giving data to the FAA, and our inspectors just look at that data and then sign off.

That is not, again, a good position to be in. And with the Government shutdown during that timeframe, industry kept rolling, and our inspectors were sitting at home because they were furloughed. So all of that backlog work, plus their normal work once they came back was a rush to get everything done. Things could fall through the cracks.

Mr. LARSEN. So given the staffing issues and training issues, and combining that with these emerging technologies in the airspace, are you changing how you train incoming inspectors to address issues like drones or the commercial space transportation issues? How is training changing?

Mr. PERRONE. So we are trying to get the FAA to work on the training issues as well. One of the things that we tried also, we twice put in for the Drone Advisory Committee, and the DOT did not put PASS on there. Again, our folks represent the inspectors who are going to end up ultimately overseeing the regulation.

We have asked the FAA why we were not included. They said DoD—excuse me—DOT made the decision. So we have asked can we get a response.

So we agree training needs to be modified and changed. And since it is a permissible subject, the agency can or not include us.

Mr. LARSEN. Thank you.

Turn to Ranking Member Graves for 5 minutes.

Mr. GRAVES OF LOUISIANA. Thank you, Mr. Chairman. I appreciate it.

I want to thank all of you for your testimony today.

Captain DePete, earlier today there were calls for more proactive early warning system type programs be put together to identify any safety concerns associated with aircraft.

Could you explain right now—I think pilots are stakeholders in this as well—can you explain right now what type of system is provided for that allows for that type of reporting to bubble up?

Mr. DEPETE. Sure. Absolutely. Thank you for the question, Ranking Member Graves.

You know, back in 1997, 1998 time period after a series of major accidents occurred and the commercial air safety team was formed, a very aggressive data collection effort came underway, where measurements of over 150 streams of data come in, with the ASAP program. The Aviation Safety Action Programs are inclusive. And the FOQA program, the Flight Ops Quality Assurance was also included in that.

And then very soon after, we saw four accidents occur, culminating with Colgan. And that led to taking a look at completing the circle and looking at the way pilots were trained. We instituted, thanks to the work of this committee, flight time and duty time regulations, although cargo was carved out ultimately, as you know, not always looking for one level of safety.

But that led to the safest period in aviation history in America, where I can say that we have moved close to three-quarters of the world's population in metal composite tubes in the lower stratosphere without a single pilot-caused fatality, with the exception of the one Southwest aircraft that had the fan blade.

So it is my belief here that the absence of accidents is a wonderful thing, but it is all the more important that we remain diligent and committed to safety, to look more and more into how we can better report.

We have got a strong, resilient system right now, a very robust system. It is working. Although, obviously we are here today, and we heard from some of the families behind me, something happened that wasn't supposed to happen.

We, many years ago, like I said, we had a forensic approach, the tombstone mentality that you mentioned, Chairman DeFazio. And now we have a risk predictive model.

So it is very important, like I said in my testimony, that we examine closely the certification, the oversight, and the designation authority and find out how we can make this better.

Mr. GRAVES OF LOUISIANA. Thank you.

Mr. Perrone, in your testimony you discuss Federal regulations for the type of certification process. And so right now who is it that establishes the certification basis for the safety standards, including the safety standards that have to be met in order for an aircraft to proceed?

Mr. PERRONE. So the regulation is done by the FAA, and then the industry has to follow that, whatever they come up with for——

Mr. GRAVES OF LOUISIANA. OK. And then who establishes the certification plan and the means of compliance and the level of FAA involvement in the verification process?

Mr. PERRONE. So, again, I think the industry, Boeing or whoever, comes up with a plan on how to do it, and the FAA oversees that procedure.

Mr. GRAVES OF LOUISIANA. So wait a minute. You are saying that the FAA—excuse me—that Boeing or the manufacturer would actually come up with a certification plan, including the means of compliance and the level of FAA involvement?

Mr. PERRONE. They come up with—again, their engineering, they do all the studies, they do what they need to do. Then the FAA makes sure that that complies with the regulation, complies with the system.

And then they have—once they do it and once they build the aircraft, or whatever the particular certification piece is, that they are following that compliance.

Mr. GRAVES OF LOUISIANA. So you are saying that the companies actually establish the certification plan?

Mr. PERRONE. They are the ones that—correct—they are the ones that know the best way to come up with that engineering design and then FAA oversees it.

Mr. GRAVES OF LOUISIANA. I don't think that is accurate. And I am very anxious to hear from the FAA on actually that certification process.

And then lastly, who is it that actually verifies that all of the requirements have been met and the type of certification that is issued?

Mr. PERRONE. So just to clarify, the FAA procedure, the certification procedure, if I miss-said it, they come up with a plan, this is what you need to do, the engineers build that, and then the FAA oversees that to make sure they follow that.

Mr. GRAVES OF LOUISIANA. I was concerned, because you noted in your testimony, "While investigations are ongoing, what we do know is that the FAA delegated primary oversight of the MAX to Boeing."

And I was concerned about that, because I am concerned that might have left folks with a different understanding than I have in regard to the process—or the role that FAA plays versus the manufacturer. I am not sure that FAA would concur. And I just wanted to make sure you clarified.

Mr. PERRONE. Yeah, I misspoke, is what I was trying to come up with. Thank you.

Mr. GRAVES OF LOUISIANA. Thank you.

Thank you, Mr. Chairman.

Mr. LARSEN. Thank you.

Before recognizing Chair DeFazio for 5 minutes, I ask unanimous consent that the following item be entered into the record of today's hearing, a letter from the Association of Flight Attendants—CWA regarding child restraint.

Without objection, so ordered.

[The information follows:]

Letter from Sara Nelson, International President, Association of Flight Attendants—CWA, AFL–CIO, Submitted for the Record by Hon. Larsen

JULY 17, 2019.

Hon. PETER DEFAZIO
Chairman, Transportation and Infrastructure Committee

Hon. SAM GRAVES
Ranking Member, Transportation and Infrastructure Committee

Hon. RICK LARSEN
Chairman, Subcommittee on Aviation

Hon. GARRET GRAVES
Ranking Member, Subcommittee on Aviation

Dear CHAIRMAN DEFAZIO, RANKING MEMBER GRAVES, CHAIRMAN LARSEN, and RANKING MEMBER GRAVES:

This Friday, July 19, 2019 marks the 30-year remembrance of United Flight 232 that crash-landed in Sioux City, Iowa after the DC-10 suffered a catastrophic failure of the tail engine and loss of most flight controls. The crew is credited for saving 185 of the 296 lives aboard in what most believe would have been a complete loss of life without their heroic efforts. While the pilots' actions gave everyone a chance to live, Flight Attendants did all that they could to prepare the cabin for impact and get survivors safely off the burning aircraft.

Through their professionalism and dedication, our colleagues showed the world the crucial role Flight Attendants have on board the aircraft each and every day. We hold close the memory of United Flight Attendant Rene LeBeau who lost her life in the crash as we pay tribute to the crew that performed miracles to save lives: Flight Attendants Janice Brown-Lohr, Georgeann Del Castillo, Barbara Gillaspie, Donna McGrady, Virginia Jan Murray, Timothy Owens, Yeoung (Kathy) Shen, Susan L. White, Rene LeBeau, Captain A.C. Haynes, First Officer William R. Records, Second Officer Dudley J. Dvorak, and United DC-10 flight instructor Dennis E. Fitch.

Tragically, one unrestrained infant perished when his mother could not hold onto him after the airplane hit the ground. In response, the National Transportation Safety Board (NTSB) recommended that the Federal Aviation Administration (FAA) require all occupants be restrained during takeoff, landing, and turbulent conditions, and that all infants and small children be properly restrained.[1]

On the 30th remembrance of United Flight 232, AFA again implores the FAA to rule that every passenger must have a seat with a proper restraint, regardless of age, and for lawmakers to take action to ensure this is implemented as soon as possible. The current practice of merely *recommending* that infants and small children under the age of two be in child restraint seats (CRS) during critical phases of flight is inadequate to protect our most vulnerable passengers.

Flight Attendants ensure that everything on board an airplane is secured or properly stowed for takeoff and landing; and that passengers are safely restrained in their own seats whenever the fasten seat belt sign is illuminated. The exception to this is children under the age of two. A coffee pot has more protection than an infant in the event of a crash. The captain instructs everyone to buckle up for protection against severe turbulence, with the exception of our smallest passengers.

In 1979, the NTSB issued its first of multiple safety recommendations on aircraft child restraints. The Board recommended that the FAA "[e]xpedite research with a view toward early rulemaking on a means to most effectively restrain infants and small children during in-flight upsets and survivable crash landings[2]."

In 1997, Representative Peter DeFazio {H.R. 754, 105th Congress) and Senator Patty Murray (S.398, 105th Congress) introduced bicameral legislation to require safe restraint of children, with age and weight limits, much like laws pertaining to travel in cars.

In 2001, the American Academy of Pediatrics recommended requiring aircraft-approved restraint systems and discontinuing? the policy of allowing a child younger than two years to be held on the lap of an adult in the aircraft cabin[3]. In 2015, the International Civil Aviation Organization {ICAO) released guidance to promote the use of approved child restraints on all commercial aircraft around the globe.[4] This demonstrates worldwide harmonization. It is past time to mandate this protection for our youngest passengers.

Any requirement to protect children under the age of two must also reflect the reality of the modern aircraft cabin environment. The Cabin Evacuation Standards Study, required in the FAA 2018 Reauthorization Bill, will show what every crew member and air traveler knows—the on board conditions for travel have changed dramatically in the last 30 years. There was a time when parents could find an empty seat to use a car seat for their child. Those days are gone and gate agents are trained to check car seats because the assumption is that parents did not purchase a seat for their child under the age of two. In some cases, this has created conflict for parents who attempt to follow the FM recommendations of purchasing a seat and using an approved child restraint.

AFA calls on the FM and lawmakers to ensure that every passenger is secured in an aircraft seat, regardless of age.

Safety regulations are written in blood. Today we must recognize and remember the 230 crew and passengers of TWA 800, who lost their lives 23 years ago. We will continue work every day for the highest standards in aviation security in their honor.

We commend the committee's work and focus on key aviation safety issues including: 10 hours Minimum Rest and a FRMP for Flight Attendants; prohibiting Flags of Convenience models that outsource U.S. aviation jobs {H.R. 3632); the grounding of the 737 MAX; stable funding for the FM {H.R. 1108); addressing sexual misconduct on planes; cabin environment and evacuation standards; secondary flight deck barriers; combating contaminated bleed air with the Cabin Air Safety Act of 2019 {H.R. 2208/S.1112); safety and security of foreign repair stations; setting temperature standards in the cabin; banning voice communications on planes; protecting Passenger Service Agents from assaults; an evaluation and update of Emergency Medical Kit contents including naloxone and epinephrine; protecting against cabin cyber security vulnerabilities; and ensuring the safe transport of lithium batteries.

The Association of Flight Attendants—CWA represents 50,000 of aviation's first responders at 20 airlines. The flying public looks to Flight Attendants when it comes

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[1] NTSB Recommendation A-90-78, May 30, 1990
[2] NTSB Recommendation A-79-063, August 10, 1979
[3] Restraint Use on Aircraft, Pediatrics, Vol. 108, No. 5, November 2001
[4] ICAO Doc 10049, p. vii, Second Edition 2019

to aviation safety. The work of this committee directly affects our ability to do our jobs.

Sincerely,

SARA NELSON
International President

Mr. LARSEN. The Chair recognizes Chair DeFazio for 5 minutes.

Mr. DEFAZIO. I thank the chair.

To Mr. Perrone, Mr. Samuelsen, you both raised the issue of—Mr. Perrone raised the issue that the FAA cannot go to foreign repair stations with no prior notice and that we are not properly overseeing them, they aren't subject to drug testing, alcohol testing, background checks, et cetera.

And then, Mr. Samuelsen, you talked about the flood of work to these overseas.

And I would just like both of you to comment on this. You know, there are no commercial flights to the United States from El Salvador, yet airlines are taking empty planes to El Salvador for maintenance and repairs. This causes some concern to me.

I mean, either of you want to comment on that?

Mr. SAMUELSEN. Yeah. I would say that U.S.A.-flagged carriers that perform work in El Salvador, particularly where they fly empty planes there to have maintenance done, there is only one reason for that, and the reason—well, they have been permitted to do it by the FAA. But the only reason for that is the pursuit of profit. There is no other reason for that. They are certainly not sending planes to El Salvador because the work is done safer in El Salvador than it is on United States soil.

Mr. DEFAZIO. You listed a few pretty disturbing examples of poor overseas maintenance work.

Mr. SAMUELSEN. Right. I mean, so there are plenty of those.

But one specific example is April 5, 2018, a plane that was serviced in South America came into Chicago O'Hare, and TWU mechanics found vital engine components that were held together with duct tape, duct tape that was applied on foreign soil by noncertified mechanics.

That is just one example. There are other examples as well that we can provide the committee after this testimony.

Mr. DEFAZIO. We would love to have those examples. I have been on this issue for years.

Mr. Perrone, you want to comment on your concerns about this?

Mr. PERRONE. Well, I just think it goes along the same lines, that the FAA used to have inspectors in different locations overseas, and they closed those offices down and brought them back to the United States for money-saving purposes.

And in the end, we believe if they were there, if they were in different locations, if they are going to continue moving the work overseas, that the inspectors should be available to do oversight inspections.

We agree with our brothers in TWU as well that the work should be done in the United States. I think we have got the greatest country in the world to see and do the oversight, and why not keep it here.

Mr. DEFAZIO. OK. And Ms. Bassani and Ms. Schulze, you both raised issues about cabin evacuation, and we mandated the procedures be reviewed.

Can you give us a quick update on where NTSB is on that?

Ms. SCHULZE. Yes. Thank you for your question.

We have made recommendations on a variety of areas for evacuation. And one in particular was to ask the FAA to form a committee, a group, to look closer at communication protocols between the cockpit, the cabin.

And at this point, the recommendation is open, unacceptable action. But we are committed to continuing that communication with the FAA on the cabin safety side.

Mr. DEFAZIO. OK. Thank you.

Ms. Bassani, you raised the issue about the length of time for one particular evacuation and problems with it and carry-on bags and all that.

Could you just give us what—and you also raised the issue of seat pitch and width. And, you know, I mean, are you witnessing the people having trouble getting in and out of those ever-narrower and closer-together seats?

Ms. BASSANI. Thank you for that question, Chairman DeFazio.

First of all, I want to thank you for the seat I am in today, because it is a lot more comfortable than what I flew down here in.

Mr. DEFAZIO. Someday I am going to get the airline execs all lined up there, and I am going to bring in the narrowest coach seats I can find, and we are going to keep them there for a few hours.

Ms. BASSANI. You know, I think it is torture. And I will tell you, from experience crossing my legs in one of those seats, and for a passenger in front of me to lean their seat back quickly, I think I almost got a broken kneecap the other day.

But it is distressing to see our passengers smashed into these airplanes now. As you know, it never used to be this way.

As flight attendants, a lot of times what we like to do to accommodate our passengers who might be taller or bigger, we like to move them to a seat that is more accommodating, which is a lot of times up at the bulkhead or by the emergency exits. However, now that the airlines are charging more for those premium seats, we can no longer do that.

So we find that the seats are not only getting smaller, but there is no padding on them anymore. It is a torture chamber for our customers and for us that also fly in our own airlines.

I commend you so much for addressing that in this committee. And we were so pleased to hear that that is being addressed. Seat pitch is extremely important, mainly for evacuating the aircraft.

The passengers already, in the normal case of getting on or off the airplane, are having difficult times getting into the aisle to sit down. Can you imagine, in a stressful situation, trying to evacuate in a real-life scenario passengers from a plane that is burning or that is half tilted or upside down.

Listen, these people are having a hard enough time, like I said, getting in and out in a normal process, but in an evacuation it is going to be almost impossible. So that is an extremely, extremely important provision for us.

Thank you for that question.

Mr. DEFAZIO. OK. Thank you.

Thank you, Mr. Chairman.

Ms. BROWNLEY [presiding]. Mr. Perry, I call on you for 5 minutes.

Mr. PERRY. Thank you, Madam Chair.

Earlier this month, the FAA announced that it has again delayed the publication of its notice of proposed rulemaking on remote ID and tracking for UAS, a rulemaking required by the 2016 FAA reauthorization. According to the FAA, the NPRM will now be published in September after the agency acknowledged it would fail to fulfill the congressional mandate by its July deadline.

FAA's track record throughout this process offers us little optimism that the new deadline will be realized, but the importance of the issue demands their immediate action.

It is my understanding that Chairman Larsen, Chairman DeFazio, Ranking Member Graves, and Ranking Member Graves expressed their concerns to Secretary Chao in a letter earlier this month. I appreciate this effort, and I share their concerns about the safety implications of continuing to operate without the remote ID and tracking system in place.

By its inaction, FAA is failing to mitigate significant potential threats to the safety of the flying public.

I would also like to highlight the impact of FAA's inaction on our global competitiveness in this up-and-coming industry. Every day the bureaucrats at FAA are unable or unwilling to do their job we cede more of our technological advantage in this industry to our international competitors, friends and foe alike.

Ms. Schulze, obviously this is in your wheelhouse, so I want to offer you an opportunity to just respond. But I would also like to hear from the other members on the panel their thoughts about whether this drone identification increases or decreases the safety in the aviation industry and the flying public and if waiting another 2 years for this critical rulemaking to be finalized in the interest of the aviation community from either a safety or competitive standpoint is a good idea.

Ms. SCHULZE. Thank you for your question.

At this time, based on the investigative work we have done, we have not identified that. We don't have a position on that issue.

I think we work very closely with the FAA and the drone industry. We do act as observers on the Drone Advisory Group to understand where these different technologies are going. And I think what we are trying to do is ensure that we are prepared to investigate accidents that might be caused in part by those types of deficiencies. So that is where our focus is right now.

Mr. PERRY. Thank you.

Mr. DEPETE. Representative Perry, great question. I actually was going to try to integrate that into my comments here today.

I am as frustrated as well, because the Air Line Pilots Association has an unwavering commitment to safety, and we have been part of the process of the introduction of UAS into our National Airspace System.

And like any use of the airspace, we want it to be safe. And we certainly recognize the socioeconomic benefits to drones. It is a fas-

cinating technology, and we support it. But we support the safe integration.

So the delay is not a good thing, in my view. We have an opportunity here to do it right the first time.

I shudder at the day that I hear about the accident when a drone gets sucked into an engine and two well-trained, well-rested experienced pilots safely get it on the ground. Let's hope that is the outcome.

But what really adds fuel to the fire on this particular issue is that ID and tracking, which we were a part of those aviation rulemaking committees, are foundational technologies that are going to be necessary for the safe integration.

So, yes, we work very closely with all our regulators, and we are going to consistently compel them to move the process along quickly, but we can certainly use your help.

Thank you.

Mr. PERRY. Appreciate it.

Director Schulze, what is the U.S. aviation safety record over the last three decades, and how does it compare to the rest of the world, if you know?

Ms. SCHULZE. Well, I can say that, as I mentioned in my statement, over the last decade it has improved in terms of the numbers. We are always looking at the individual factors involved in accidents, and we think that safety is something that one must always be vigilant, no matter what the numbers are reflecting.

I don't have three decades' worth of data with me. We would be absolutely happy to follow up with you after the hearing on that data.

But I would just reinforce that the numbers do tell one side of the story, but it is critically important, as I think some of the other witnesses have testified, to be proactive in understanding these issues as they manifest through some of the voluntary reporting programs and in terms of our role, under accident investigations.

Mr. PERRY. Thank you, Madam Chair. I yield.

Ms. BROWNLEY. Thank you.

Mr. Cohen, you have 5 minutes.

Mr. COHEN. Thank you, Madam Chair.

I presume some of the—I know they are—I appreciate the relatives testifying, very courageous and compelling testimony. Thank you. I am sorry. I was here but I had to go to another hearing.

Airplane safety is so important. And in those crashes, it was death. It is a serious matter and the public deserves the right to know when decisions to increase profit margins have an impact on their health and safety.

The MCAS—that happened, but it happens in other places as well.

Federal law requires the planes be capable of being evacuated within 90 seconds of an emergency. That is Federal law.

With half the aircrafts' exits inoperable, there have been several recent occurrences that raise questions of whether all passengers on an aircraft can indeed evacuate within 90 seconds.

In 2016, the NTSB concluded it took at least 2 minutes, 21 seconds, 51 seconds longer, over half the time longer than the FAA as-

sumes is the correct time, for 161 passengers to evacuate a lightly loaded American Airlines flight.

In January 2018, the NTSB concluded that evidence of passengers retrieving carry-on baggage during this and other recent emergency evacuations demonstrates that previous FAA actions to mitigate this potential safety hazard have not been effective.

This should concern everybody. It is not the same as a plane falling out of the sky. But when a plane does have an emergency and they land and people can't get off in time, injuries and deaths occur. They are preventable.

Emergency evacuation is a serious issue, as is the potential for air rage as tensions mount inside more tightly packed cabins.

Doctors have warned that deep vein thrombosis can affect passengers, afflict them, who don't move their legs during longer flights.

Despite this, seat sizes continue to shrink, and the seat sizes shrink not on their own, but because the airlines want to pack more people in, they want to emulate sardines in an airplane. They pack people in, in their sides, in front, you can't cross your legs, you can't get out.

That is why Representative Kinzinger and I introduced the Safe Egress in Air Travel, or the SEAT Act, an acronym, that requires the FAA to review cabin evacuation procedures and issue regulations establishing minimum dimensions for passenger seats necessary for the safety of passengers.

Pleased it was in the FAA reauthorization bill. Great work. Nine months since it passed into law, and it appears very little action has taken place. This is something that could save lives, and in 9 months since the Congress said do it, nothing has apparently been done.

Ms. Schulze, you are the Acting Director of the Office of Aviation Safety, National Transportation Safety Board. As mentioned in Ms. Bassani's testimony, it appears zero action has taken place in implementation of the SEAT Act.

Has the FAA begun working with the NTSB on implementation of the SEAT Act?

Ms. SCHULZE. Well, thank you for your question.

We have been contacted by the FAA, but I would say that there are additional conversations that are going to ensue. I think it is at the planning stage, would be our assessment. But we have been contacted.

Mr. COHEN. And after 9 months after Congress said to do it and lives are in the balance and you are in the conversation stage?

Hello. How are you? I am here at the University of Michigan as a freshman. Nice to meet you.

Don't you think you ought to take some action by now?

Ms. SCHULZE. Well, certainly the FAA requirement that was in the legislation is clear. We have made a number of recommendations, and we continue to work proactively with FAA to have those implemented. But from our standpoint, we are remaining fully open and ready to receive that work with FAA.

Mr. COHEN. Can I ask you to try to call them and urge them to start to act on behalf of the flying public?

Ms. SCHULZE. We absolutely, on a routine basis, interact with them to promote and advocate for those recommendations—for our recommendations.

Mr. COHEN. Thank you.

Ms. Bassani, in your written testimony, you discuss the importance of the SEAT Act and how important it is for FAA to review cabin evacuation procedures.

Can you expand on why the implementation is so important and how a new review of cabin evacuation procedures could possibly affect your members?

Ms. BASSANI. Thank you for the question, Congressman Cohen.

First of all, I want to thank you for spearheading that act. It is one of the single most important things that flight attendants find that we need right now and that our passengers need.

Safety is so important. And like I said earlier, safety is in our DNA. It is so important that we enact this soon, sooner rather than later, because the airlines are smashing seats into these airplanes. Come on.

And when I talk to them, as the president of my union, and say this is ridiculous, we have a seat right up on an emergency exit on one of the newer planes, we have to almost sit in a passenger's lap to arm and disarm that door, and you know what they say in response? Oh, my God, if we have to remove that seat, that equates to $500,000.

In my mind, every inch equates to a customer, a passenger's life, possibly. In their mind, every inch is real estate and it is dollars, and it is ridiculous. And I implore this committee to take that seriously. That is what we are here for. That is what you are here for. That is what all of us are here for, the safety in the aviation industry.

And when I see the frustration of Congressman Cohen, you can triple that for us out here that have to deal with this every single day. And the reason why—we know why our passengers are enraged. Come on. By the time they get on the flight, first of all, they are already traumatized by the whole travel experience. And we inherit them, and it is our job, and we learn how to diffuse situations.

But when you are up in the sky, there is no way you can say you need to leave and go out that door now. You have to deal with them. And it rests on us, it rests on us in the back of the aircraft.

And it is extremely, extremely important that people not only feel comfortable, but that we are able to evacuate them in the case that we can save their life. And in some cases we can. And Congressman Cohen very eloquently stated some of those cases that have happened recently.

Thank you very much for listening.

Mr. COHEN. Thank you.

And in closing, this is like the 737 in regards that they don't want to use actual people to test it, like simulators would be best. They want to do a computer study and have people who are all 150 pounds, 5′9″, that just ran a marathon getting off the plane in perfect tennis shoes.

Ms. BASSANI. With a service animal, like a dog.

Ms. BROWNLEY. Thank you, Mr. Cohen.

Mr. COHEN. You are welcome.

Ms. BROWNLEY. I recognize Mr. Fitzpatrick for 5 minutes.

Mr. FITZPATRICK. Thank you, Madam Chair.

Thank you all for being here today.

Mr. Samuelsen first. The FAA certifies aircraft mechanics and technicians in the United States. First question is, do the workers in the foreign facilities have similar or equivalent certifications? And is there any reason we shouldn't require these workers to have at least an equivalent certificate from their Government before we allow them to perform any safety-critical work?

Mr. SAMUELSEN. Yeah. So the answer is absolutely not. There is no lawful requirement that mechanics or so-called mechanics on foreign soil have the same certification as those on U.S.A. soil. And it should absolutely be required. The playing field should be leveled.

It has been said many times that airlines should not compete on safety, and that is exactly what is going on right now. They are competing on safety by sending work into foreign countries to try to save as much money as possible, even though it is objective and factual that work done overseas—in most overseas countries—is less safe than when it is done on U.S. soil.

Mr. FITZPATRICK. Thank you, sir.

Captain DePete, as you said in your testimony earlier, so that there is no confusion, it was Congress' intent that secondary barriers be installed in each new aircraft that is manufactured for passenger air carriers in the United States.

Do you believe that the formed Aviation Rulemaking Advisory Committee Working Group is useful? And how can Congress act to ensure that there are no more delays and that the requirement is issued by October?

Mr. DEPETE. So we see this issue as so important right now for the security of our passengers and crew. We have examined this issue for so long that we view the current efforts underway as nothing more than delay tactics.

Having a secondary barrier is so critical because it preserves—let me make it clear—preserves the reactionary gap that is absolutely essential when that door is opened.

And there have been tests done by the Department of Homeland Security, and how they have tried to take a flight attendant in a cart and see if they can get by them, and they valiantly stand there and try to help as best as they can. But we can do so much better. These have proven to be inexpensive, lightweight, very easy to install anew and then design into other airplanes. And then coming up with a million different—and I have been on many of those working groups.

But here is the real critical part, if I will. Just walk with me for this one. Somebody does get in. Without a secondary barrier, since it is an intrusion-resistant cockpit door, they lock themselves in the airplane in the cockpit. And now you have an intruder that you can't get at. Because I have often heard them say, this is never going to happen on a passenger airplane. Passengers are just never going to take it. They are going to, you know, run up and assault whoever is trying to do it. But that is the risk.

One simple solution. It is so easy and it is so inexpensive. I have heard a A4A even say, well, how much is it going to cost in fuel burn? Well, we used to carry around 60-pound bags with all our gear on it, all our flight pubs. And now we have electronic flight bags that weigh a fraction of that. I just suggest we call it even and put something in the airplane that will keep our passengers secure and safe.

Mr. FITZPATRICK. So what is the cause of the delay, and what can we as a committee do to fix that?

Mr. DEPETE. I think that we can say enough is enough, number one, that we have enough information to go forward—it has been mandated now—and get a concrete timeline for installation.

And the other thing is to fight back special interests who are starting to already make noise about the fact that we meant type design and not—we were very careful about how we put that language together. So that would be extremely helpful. We don't need to know much more about this, but we do need a solution. And we can make a difference, because if it happens what will we say? What will we do? What do I tell my members?

Mr. FITZPATRICK. Nearly 18 years after the 9/11 Commission Report, where they explicitly spelled out how the 9/11 hijackers would zero in on the cockpit and wait for that exchange to occur, still no action.

Mr. DEPETE. Well, to add insult to injury, again, as a cargo pilot, we have airplanes without hardened cockpit doors. We have animal handlers, some of them foreign nationals, and they have syringes and sedatives capable of taking down a large animal sitting behind. The pilots, we have already had instances where there has been confusion about what their instructions are and how they are supposed to behave in a cockpit. And it is so clear after 9/11. And the promises that were made by the industry to make sure that hardened cockpit doors—so—and that is just one of many of the shortfalls and one level of safety between passengers and cargo, but these are all—we know the solutions to these problems, but ALPA will continue to focus and fight against the special interests that seem to want to put hurdles in the way of the fine work that is being done by this committee. By the way, thank you for the FAA Reauthorization Act. Incredible, incredible. The question is now can we push it forward without other folks trying to will it away.

Mr. FITZPATRICK. Thank you, sir, and thank you for your service.

I yield back.

Ms. BROWNLEY. Thank you, Mr. Fitzpatrick. Mr. Brown, you are recognized for 5 minutes.

Mr. BROWN. Thank you, Madam Chair. I have a number of questions, and I just ask the panelists to be brief in your response if you could.

Captain DePete, in your written testimony, you discussed the different pilot licensing requirements at the international level.

Mr. DEPETE. Yes, sir.

Mr. BROWN. Specifically, the international aviation regulatory body recently introduced a license called the multicrew pilot license. And you have mentioned some potential safety issues associated with that. Can you elaborate?

Mr. DEPETE. Yes, sir, I can. Thank you for the question, a really important question, especially given the discussions today. So, most recently, I wrote a letter to Secretary Liu, the Secretary General of the International Civil Aviation Organization, asking for a global review of pilot training and qualification standards. I want to qualify this conversation before I begin, though.

The pilots in Ethiopia and Lion Air were at a significant disadvantage by not knowing what was on the aircraft. If you know anything about—we are specialists in human factors and startle responses, and I think Captain Sullenberger was very eloquent about how he described this. In these very automated airplanes with these integrated systems, we need more training, not less.

So the only thing that stands in the way—I have seen automation all my life. I have seen good automation that helps me do my function. And I have seen automation that tries to replace me, and it is just dumb, and we have to figure out ways to work around it. And those are the things that they become distractions almost in a way.

So we have seen how it is supposed to work. Automation is supposed to be assistive technology to help us do our job of monitoring the flight path and making sure it is safe, not replacing, because when you go down that road, there is not a level of artificial intelligence that exists today where that capability is sound.

The failure of the Boeing 737 MAX in particular, we are looking at a series of—very typical to see in these types of accidents a series of system breakdowns—not one thing. And we have a very vast interconnected aviation ecosystem.

But, clearly, I want to ask you a question. You have your family or yourself on an airplane. Do you want your crew to be well-trained and experienced, or do you want them to just be trained strictly to rely on automation? That is a simple question, and I am not relating it to any other events at this point, because that particular airplane had a system malfunction that basically made it almost impossible or difficult to control if you didn't know about it and you weren't prepared for it, you didn't train for it.

We here in the United States—I know this is a long answer. There isn't an airplane I have flown where I didn't have a runaway trim system failure. But if you miss it or if there is a startle response or some impact or other distractions—this particular instance, that is why we have called for more robust oversight into the oversight process, the designation authorization and the certification process.

Mr. BROWN. Thank you. Thank you.

Mr. DEPETE. Long answer, but I am sorry, it is the only way to cover it all.

Mr. BROWN. A lot of these issues require a lot more time than we have from the dais here.

Mr. Samuelsen, in your written testimony—and you also touched upon it today—you mention that more than 8,200 aircraft maintenance jobs have been moved abroad to foreign repair stations since the early 2000s. Can you go into more detail on your organization's observations of subsequent shortages of qualified U.S. professionals and what we ought to be doing to address those shortages?

Mr. SAMUELSEN. Yes. So I don't think the cause of that is—in fact, the cause of that is not that there are untrained professional mechanics in the United States. The cause of that is that the FAA has allowed loopholes——

Mr. BROWN. Let me clarify. I agree with you. I think it is the effect. If you have got foreign overseas maintenance, then you have less jobs in the United States and then you see a decline in workforce as a result. Are there critical shortages in the professional——

Mr. SAMUELSEN. No.

Mr. BROWN. No? OK.

Mr. SAMUELSEN. No, there aren't. But I think the airlines use that as one excuse to continue to export American jobs overseas—and capital, $2 billion worth of capital.

Mr. BROWN. Thank you.

Ms. Bassani, you mentioned the 10-hour rest period. You also mentioned a lot of conditions that put a lot of strain and stress on the ability of a flight attendant to do their job. Can you sort of put a face on that? I mean, you know, if we are not meeting 10-hour crew rest requirements, how difficult that is to perform the job of the flight attendant?

Ms. BASSANI. Thank you for that question, Congressman Brown. First of all, it is important to recognize that that 10-hour rule, that doesn't mean behind the hotel door. That is from the time you leave the aircraft until the time that you check into your next trip. So that in itself is already a reduced rest. Ten hours is not enough, but it is what we have now, and we hope that we can—we need to get that through. It should not be being slow-walked at this point.

Flight attendants must be alert at any minute to be able to perform something as important as an evacuation or perhaps operate the AED machine to save your life if you are having a heart attack. How can they be alert if they haven't had enough sleep? And I am not talking about just on domestic soil, but flight attendants also fly internationally. In America alone, you have three different time zones.

So you factor in all of those different types of things, and it is so important that they get their rest. Like I said, that is minimal. They need more. But it is so important to get that done for our flight attendants and for our passengers' safety. Thank you for that question.

Mr. BROWN. Thank you.

Thank you, Madam Chair.

Ms. BROWNLEY. Thank you.

Mr. Stauber, you are now recognized for 5 minutes.

Mr. STAUBER. Thank you very much, Madam Chair.

I really appreciate the witnesses and your comments, in particular a point about the safety. Every one of you, the safety was the priority. And before I begin my questioning, I will give you a little history of my background. I was a police officer for 23 years, ended up as a commander. Safety was the number one priority, that the men and women that I worked with went home to their families. And to hear that there were family members that didn't come back, it is heart-wrenching. And to those family members, our

thoughts and prayers. And we are going to do something about it. We will make it better with the experts here. And I appreciate all your comments.

Ms. Schulze, while the workers in the front lines are critically important to aviation safety, it is also important that we have the regulations and safety protocols in place to ensure the safest possible experience. Much of the responsibility falls on the shoulders of the FAA and the NTSB. As you know, in July of 2017 at San Francisco Airport, an Air Canada Airbus A320 nearly landed on a crowded taxiway, mistaking it for a cleared runway. Information about a runway closure that could have prevented this confusion was located on page 8 of the 27-page list of San Francisco Airport NOTAMs. It was the NTSB's finding that a contributing factor was the ineffective presentation of the note of information.

How has the FAA responded to this recommendation?

Ms. SCHULZE. Thank you for your question. We did issue a recommendation to ask that that type of information be—methodology to better prioritize that information for pilots be developed. I will need to get back to the committee on the current status of that.

We have had some more recent conversations with the FAA, but I think I would also comment that, because of our engagement with the industry and the FAA, we do understand that they have been looking at the NOTAM process for some time. Our recommendations were more specific to the findings in San Francisco.

Mr. STAUBER. Thank you. And as you know, I put forth legislation, the Notice to Airmen Improvement Act. And I think it is important that industry experts have the ability to prioritize that safety information, that the pilots understand the importance. But, quite frankly, to have a 27-page NOTAM, I think, Captain DePete, you would agree with me that let's prioritize the information that is absolutely needed, so, as you command that aircraft, you know the concerns around the runway, concerns around the airport, and you can make a decision whether it is safe or not.

Mr. DEPETE. Absolutely. And I appreciate that question, because that was a bit of a game-changer when that one happened. And in particular, it was a very alert crew on the parallel taxiway from United Airlines that happened to comment on it. And I venture to ask myself a question, if that was a fatigued cargo crew under a different set of flight-time/duty-time rules, would they have caught that like that? So, again, that elaborate interconnectedness of a, you know, complicated ecosystem, aviation ecosystem.

But wrong runway surface landings are a very big issue, particularly of interest to us in the Airline Pilots Association, but also in the FAA and the NTSB. There are various technologies that could be very assistive, like FAROS, Final Approach Runway Occupancy Signaling, and things like that that can be employed. Better guidance.

We think that in 121 operations, airline operations, that there should be precision approach guidance to every runway. It was decided by the FAA it is the safest course of action in 2000, and yet some people are still trying to push that back.

Mr. STAUBER. I think, with your input, the professionals' input, the legislation I think will get much better.

My last question is, Ms. Bassani, and to go back to the front lines, we really appreciate everything that flight attendants do for our safety, much of what many of us don't notice.

I appreciate you bringing up cabin air safety in your testimony, because it matters and it matters especially because of the long hours you all spend in that environment. I am a cosponsor of the Cabin Air Safety Act that you also mentioned in your testimony. Would you be able to talk a little bit more about the legislation and how it can help?

Ms. BASSANI. Yes, I sure can. In fact, first, I want to thank you for helping with that. It is also very important.

One thing that I noticed, I have been flying for 33 years. Since I have been president of our union, which is only a year, we have seen an uptick in these incidents. And, in fact, in the past, we didn't have very many of these types of occurrences. Like I said in my testimony, last year alone, 1,500 reported fume acts from our flight attendants. That is huge. And I know the pilots are experiencing much of the same, and I know that John Samuelsen also is an advocate for getting something done with this as well.

It is really important that we have a way to record and to collect data and reporting procedures are standard throughout all of our airlines and systems, including management and the unions. I have actually hired a specialist in this area about, oh, 4 months ago, because we needed more help. We need someone dedicated to help these flight attendants that are experiencing these fume events. And it really is damaging their health. There are a lot more stories. There are a lot of dedicated, you know, Facebook pages and, you know, I am sure you have seen some of the videos. And I want to thank you for stepping up and helping us with this.

Mr. STAUBER. You are welcome. We are going to work on it, and I appreciate your comments.

Madam Chair, I yield back.

Ms. BROWNLEY. Thank you, Mr. Stauber.

I now call on Mr. Carbajal for 5 minutes.

Mr. CARBAJAL. Thank you, Madam Chair.

Captain DePete, in your testimony, you recognized the difference in safety rest standards, flight time duty between passenger airline and cargo airline operations.

Mr. DEPETE. Yes, sir.

Mr. CARBAJAL. The so-called cargo carveout.

Mr. DEPETE. Right.

Mr. CARBAJAL. Can you explain to me how this came to be and why this is a problem, and what do you believe should be done about this imbalance?

Mr. DEPETE. OK. Thank you for that question. Near and dear to my heart, of course. And I know we have somebody in the audience here who was also on the ARC, on the flight time/duty time ARC, so I will try to get it right.

Obviously, after the Colgan accident, when it was determined that fatigue played a part in the accident, through an ARC process, we came out with—industry and regulators worked together with labor to come up with FAR 117. I think it is a pretty good rule.

And due to a cost-benefit analysis that was done, it was determined—and I say a specious argument at best, because I looked at

what examples they cited to make the determination. They eliminated cargo out of the rule, based on an ineffective cost-benefit analysis. I think the cost was supposed to be upwards of $500 million, and it was only a $31 million benefit.

Now, I would say that that is a dangerous way to go in the sense that you could weigh and maybe weight the idea of what the cost is or the benefit is. First of all, like I said, I think it was flawed. They weren't measuring a 777 loaded with dangerous goods barreling down into Los Angeles. They picked a 727, an old aircraft that fell short of a runway in Florida somewhere in Tallahassee in a remote area. So a flawed cost-benefit analysis.

But all the same, I think we should maybe look or you could look, the committee could look at as to whether or not when we are dealing with safety issues, do we want that to be the number one weighted factor, or do we want it just somewhere in the list.

Second of all, here is the real situation. Imagine this for a moment, and I use this example a lot. You have a schoolbus in one lane on a highway, and you got your children on that schoolbus. You have got your children going to school on that schoolbus. And right next to it is a tractor-trailer carrying a bunch of freight on it.

It is a proven fact scientifically that time awake of 17 hours or more on task is equal to a blood alcohol level of about .05. So you have a very sober driver driving your kids to school and right next to him is a tractor-trailer. And my point in bringing that up—who is impaired, obviously impaired. My point in bringing it up is we share the same skies. We fly over the same cities. We land at the same airports.

I remember even the—if you know traffic collision avoidance system, it was included in passenger airplanes and not in cargo aircraft. And it took an almost head-on collision with Air Force One to make that change.

So it is a gaping—if I had to describe it as anything, you are only as strong as your weakest link. You have a great safety system, but that is one gap that needs to be closed. And I will conclude with this, because it is an important statistic.

When you look at the two individual risk factors of both passenger ops and cargo ops and you look at the frequency with which passengers fly and cargo fly, kind of tallied, if you looked at the number of departures and we swapped and we did as much flying as passengers did, in 1 million departures in 10 years, you would have 276 accidents in that 10-year period. That is the difference in that risk profile. It is startling. So we really need to close that gap because you are only as strong as the weakest link.

Mr. CARBAJAL. Thank you.

I will yield the remainder of my time to Representative Napolitano as she has to go vote for another committee.

Mrs. NAPOLITANO. Thank you, Mr. Carbajal.

Ms. Bassani, I fly twice a week back to California and coming here, and I have the greatest respect for flight attendants, the primary connection with customers. They get asked every imaginable question about the safety, security, and efficiency of the airplanes and the airlines. And I have overheard flight attendants get asked

questions that only an aerospace engineer could answer, yet they have been very diligent and intelligent in answering questions.

Do the airlines, the FAA, and the airplane manufacturers give you sufficient training to handle any question, especially technical questions? Should it be your job to handle them?

Ms. BASSANI. First of all, I would like to thank you for your question, Mrs. Napolitano. That is a loaded question. We do receive annual training, emergency training. They don't cover questions, you know, for every single incident. No, I would say no.

Flight attendants themselves are a very inquisitive group, and, of course, the longer that you are around the airline and working in the airline, you do gain knowledge that you wouldn't normally have just as a passenger. But there is so much now that has changed in the airline industry; perhaps that is something that we do need to pursue. And I thank you for that question.

Mrs. NAPOLITANO. I would think so. Thank you very much.

I have other questions for the record.

Thank you very much, Mr. Chair.

Ms. BROWNLEY. Thank you, Mrs. Napolitano.

I will now recognize myself for 5 minutes.

I wanted to get back to the foreign repair stations, Mr. Samuelsen. And I know in your testimony you talked about the fact that I think both in 2003 and 2015, the IG has identified on several occasions weaknesses in the FAA's oversight of overseas repair stations. The FAA Reauthorization Act of 2012 and 2016 addresses repair station oversights. We are talking about issues of drug testing, preemployment background checks, and security screening. Now we have Thailand and Costa Rica classified as category 2. And category 2 is defined as the Government does not have the confidence—it does not have the confidence—to meet safety standards.

So I just want to ask—it has been somewhat asked already, but what are the FAA's stated reasons for the failure to implement this law?

Mr. SAMUELSEN. I honestly don't know that the FAA has articulated a good reason for allowing these loopholes to continue and allowing the work to be sent overseas. And, certainly, they don't have a good reason. There is no reason for them to continue to allow U.S.-flag carriers to do work in the countries that you mentioned that have been downgraded. It is a potential disaster waiting to happen.

And we have heard a lot of conversation today about safety being the paramount issue in not only the aviation industry but across the entire transport sector. And I don't think that the current situation with the FAA or passenger air carriers recognize safety as their paramount function. I think they are willing to jeopardize safety in order to maximize profit by sending aircraft maintenance into foreign countries that have objectively less safe standards than we do on U.S. soil.

Ms. BROWNLEY. And have you yourself been to some of these foreign repair stations to witness it for yourself?

Mr. SAMUELSEN. I have not. I have not. But we do have plans to go to Brazil to try to access the hangar where American Airlines is doing some work.

Ms. BROWNLEY. Thank you.

Mr. SAMUELSEN. Some shoddy work.

Ms. BROWNLEY. Thank you for that.

And, Captain DePete, is this a concern for you?

Mr. DEPETE. Oh, absolutely, ma'am. Chairman, over my entire career, it is pretty clear whenever we have had an aircraft come back from a foreign maintenance station, we are always taking a good look, and we ourselves have found instances in all our carriers where that can occasionally happen. It depends on the carrier.

Some of the countries where we have these foreign maintenance stations are decent players, and others aren't. They typically go to lowest bidder. And I have always said this: Skilled labor is not cheap. Cheap labor is not skilled. And you end up getting what you pay for.

Ms. BROWNLEY. Thank you.

Ms. Bassani, do you have concerns about these foreign repair stations?

Ms. BASSANI. Oh my god, yes, of course we do. In fact, we have supported the TWU in their quest not to offshore American jobs. We think it is very, very important to keep those jobs not only on our soil, but for the reasons that John Samuelsen outlined. It is going to keep our aircraft safer. And we fly on those aircraft, so we have extreme interest in how those aircraft are maintenanced. So we want to keep them here.

Ms. BROWNLEY. Thank you.

Captain DePete, Mr. Sullenberger was here at our last hearing and talked about the simulators and about the importance of full motion simulators to create that muscle memory. And in your testimony, you talk about this and you talk about how there seems to be a movement within the industry now to move more towards nonmotion simulators. You talk about, you know, the pros and cons on both. If you could just speak to that, I have 34 seconds left.

Mr. DEPETE. OK. That is a really great question, and I will try to answer it quickly. We just recently had an instance where—it is a requirement now to have upset and recovery training. Who is in control of the aircraft, having our crews trained to be able to handle that situation. And there were some airlines that were looking at doing this in a non-full-motion simulator. And you just simply wouldn't get the same effect, in terms of the training. So, yes, it is really important.

And simulators are great. They can do certain things, and they cannot do others. They don't replicate a real flight. In fact, I know, as a line check airman for FedEx, that there were times when people that would teach only the simulator and would be only in the simulator, and they were instructors. When they would go back to actually flying the real airplane on the line, they would actually have to take somebody with them just to kind of go through because it is a different experience.

I know the fidelity has increased in some of these machines, but they haven't reached the level to where it equates to really flying air. Experience matters.

Ms. BROWNLEY. Thank you very much. And I thank all the witnesses for being here. This is a very important hearing, and I appreciate you very, very much.

And I now recognize Ms. Norton for 5 minutes.

Ms. NORTON. Thank you very much. And I second what you just said, Madam Chair.

I have a question first of Mr. Samuelsen because I remember in your testimony that you had indicated that the FAA had directed agencies—or workers, rather, at foreign repair—that Congress had directed workers at foreign repair stations who performed safety-sensitive work to undergo preemployment background checks.

Do you have any information on the kinds of vetting that is currently being done? I am particularly interested in whether what happens abroad is consistent with the vetting we require here.

Mr. SAMUELSEN. Yes. So what happens abroad is absolutely inconsistent with what happens on U.S. soil. And certainly, it is one of the reasons why the work is less safe when it is done overseas in most overseas countries. And the FAA has failed to follow through on what Congress has——

Ms. NORTON. How long have they had so far?

Mr. SAMUELSEN. Several times over the last decade Congress has acted, but the FAA is lax in their enforcement, and it is potentially going to lead to a disaster. We have seen a disaster in the air transport system recently. And certainly, the FAA seems to be waiting around for another disaster to occur to start addressing these things. They should be proactively addressing these things and mitigating against the introduction of risk into the passenger transport system, aviation system.

Ms. NORTON. This is an open hole, open obvious hole in our system. It doesn't have to do with airplanes; it has to do with people. I am very concerned and ask for followup so that we can get a response from the FAA on when they intend to and how they intend to conform with what Congress has apparently asked them to do some time ago.

Ms. Bassani, I really can't resist asking you about something you mentioned, the kinds of animals that you can bring onto planes: monkeys, chickens, pigs. I can't believe this. Miniature ponies, penguins. Come on. I can tell you if you brought some of those onto a plane, I would have to get off.

And so I must ask you if the FAA bill, this section 437—and I don't know precisely what it requires, but I wonder if you think it requires enough to address who gets onto planes, who is really a legitimate passenger. And I would like to know if Congress needs to do more to keep from frightening passengers with who gets brought onto planes. I would like your response and the response of any of you on this.

Ms. BASSANI. Thank you, Congresswoman Norton. Yes, we support section 337 of the FAA bill. And it should clarify——

Ms. NORTON. 437, go ahead.

Ms. BASSANI [continuing]. What constitutes a service animal in the first place. And, you know, they are not trained, so they need training on how to travel if they are going to bring those service animals on board.

Ms. NORTON. A service animal, is that defined in the statute as just somebody that makes you feel better about being on the plane? I mean——

Ms. BASSANI. It is an emotional—I am sorry. It is emotional support animal.

Ms. NORTON. Well, that means anything can get on the plane.

Ms. BASSANI. Well, we have seen almost anything on the planes; that is for sure.

Ms. NORTON. Yeah. Again——

Ms. BASSANI. There needs to be some oversight on this, definitely.

Ms. NORTON. I hate to ask for a hearing on this, but I am going to have to ask for Congress to try to clarify what we mean. And it sounds so open-ended that it is not what we intended.

Finally, Ms. Schulze, could I ask you, I am concerned about the outsourcing of aircraft maintenance to foreign repair facilities and whether there has been any investigation by NTSB that has linked aircraft crashes to outsourcing of any kind. Have you even investigated that?

Ms. SCHULZE. Thank you for your question. We do not have a position. We have not established a position on that because we have not seen that factor. But I will add that, clearly, we are going to look at all factors that can contribute to an aviation accident, including maintenance.

Ms. NORTON. It is outsourcing I am particularly concerned about.

Ms. SCHULZE. Right. So we have not addressed that at this point.

Ms. NORTON. Will you be addressing that? Will you be looking at that?

Ms. SCHULZE. Certainly if the evidence points us in that direction, we will do our normal comprehensive job of looking at that.

Ms. NORTON. Again, I would like to ask the committee to ask that NTSB look at—any outsourcing when it comes to aircraft, we ought to be looking at. Thank you very much.

Mr. GARCÍA [presiding]. Thank you, Congresswoman.

Next, I would like to recognize Representative Katko for 5 minutes.

Mr. KATKO. Thank you, Mr. Chairman.

And thank you all for being here today. Good afternoon. It was morning, now afternoon, and hopefully doesn't go into the evening for you. I do thank you all for being here, and I again want to acknowledge the parents in the corner, as you are there at all these hearings, and our heart goes out to you all and God bless you for what you are going through.

Obviously, the name of the game is safety and how can we make it better. And so, for Ms. Schulze, the first question I have is there seem to be efforts afoot to, you know, support the efforts over the last several decades to change the aviation regulatory culture from punitive to collaborative. And I wonder if you could talk a little bit more about that and what that would mean if we could try and get more collaboration and less punitive going on, so we can have better procedures going forward.

Ms. SCHULZE. I am sorry. Was that question for me?

Mr. KATKO. I am sorry. It was for Dana Schulze.

Ms. SCHULZE. Yes, thank you.

Thank you for the question. I think that, from the NTSB's standpoint, we have certainly supported the approaches that are being taken. We are observers on the Commercial Aviation Safety Team and the corresponding ASIAS activity that occurs to integrate a lot of these programs that I know Captain DePete mentioned with re-

gard to flight operations, quality assurance, and the Aviation Safety Action Program.

We also have actually, to the point of having a memorandum of understanding with those organizations to obtain information to help us when we are looking at safety issues in a particular investigation. And I think what we have seen is that there is a wealth of information in those systems, but it is really predicated on people coming forward and being unafraid to come forward and bring up information that could be very useful to identifying previously unknown hazards in the aviation system.

So we do have a working relationship with those groups. We have seen value to contributing to our investigations. We are appreciative to the committee for our authority to use voluntary safety information to inform our investigative process. That is where we are at today.

Mr. KATKO. Are there things we can do better even more in that regard to improve the process?

Ms. SCHULZE. We don't have a position in terms of a recommendation on those processes because we haven't seen a particular deficiency. I think that for us, it is continuing to be able to work collaboratively with the industry to get access to that information. It can help us identify emerging issues in the aviation safety system through our incident investigation process, much like we did with the Air Canada 759 investigation. So we appreciate that authority.

Mr. KATKO. Thank you.

Captain DePete, is there anything you want to add to that before I ask you another question?

Mr. DEPETE. I am sorry. Add to that, you said?

Mr. KATKO. Yes. Is there anything you want to offer in that regard?

Mr. DEPETE. I very much believe in robust reporting. And, in fact—and that is the question, right?

Mr. KATKO. Pardon me?

Mr. DEPETE. That is the question you want to address?

Mr. KATKO. Yes.

Mr. DEPETE. I just want to be sure that I was going to answer it correctly for you. I was absolutely thrilled—and by the way, thank you. Great to see you again and thank you for all you do for safety and security.

Mr. KATKO. You are welcome.

Mr. DEPETE. You do a lot. It was really fantastic to have the automatic acceptance of ASAP reports, number one, because the ASAP reports and other voluntary safety action programs have contributed greatly to a period of safety in aviation history that we haven't ever seen. So thank you for that.

It is so important, especially now, since we see fewer and fewer accidents here in the United States, that that reporting continue to be robust and we continue to look at new ways to make it even better because the fact that we aren't seeing the accidents and we need to know where the stress points in the system are. So I can't overemphasize how important that is to us all.

I would say that, since we talked about fumes quite a bit, that we have been trying to work working across the board with others,

both industry and regulators, to implement reporting for fume events as part of the ASAP program. And we worked with some of our carriers to get that done.

But it would be very helpful if this body could help us in the sense that there needs to be a repository for all that data to analyze it, to see where we can go and really completely understand from a very neutral position what is happening in the airplanes.

Mr. KATKO. I would ask you, I mean, if you have suggestions, more details, please submit them to me. And I will be happy to take a look and see what we can do from a legislative standpoint.

Mr. DEPETE. Thank you very much.

Mr. KATKO. Ms. Bassani, I don't think I have time to ask a lot of questions, but I will note that Congresswoman Holmes Norton's concerns are well founded. I think we need to get kind of a handle on the extent of this program. I am all for accommodating passengers as much as they can, but I also don't want to see the process being abused and getting out of control. And to some extent, I am a little concerned about that as well. So I would just ask you if you have information on that you would like to provide us with, I would like to hear it.

Ms. BASSANI. Thank you. We can provide that in writing.

Mr. KATKO. Thank you very much.

And I yield back, Mr. Chairman. Thank you.

Mr. GARCÍA. Thank you. I now recognize myself for 5 minutes.

In both 2012 and 2016, Congress directed the FAA to address three safety gaps between domestic and foreign repair facilities: One was security screening for safety-sensitive personnel; another, risk-based oversight of facilities; and, third, drug and alcohol testing. To date, the FAA has taken no actions on any of these, to my knowledge. Since 2016, the FAA has approved a net of 200 more overseas facilities.

As I understand from the testimony today, more than 8,200 maintenance jobs have been offshored. This outsourcing further enables airlines to evade critical safety and maintenance rules that apply at American facilities. It also appears to me also an effort to avoid organized labor.

To Mr. Perrone and Mr. Samuelsen, how many new foreign repair stations have opened since these directives beginning in 2012 were first passed into law and what safety gaps exist?

Mr. SAMUELSEN. So the answer to the question is it is 200 in the last 2 years and 300 since 2016. There are 900 in total. I am not sure how many since 2012. But, certainly, the FAA has created an atmosphere where American passenger air carriers, U.S.-flag carriers, are exporting more and more work overseas. And there is only one reason to do that, and that reason is for profit. It is certainly not because the work is being done safer.

And I would further say that the U.S.-based mechanics are an effective stopgap. They are a stopgap for work coming back from overseas facilities, China and South America, where the work is done in an inappropriate way, and we have given some examples of that. But they are a stopgap. And eventually work being done overseas is going to lead to the potential of a disaster happening to American citizens on a U.S.-flag carrier.

And the issue of avoiding organized labor, I think it is maximizing profit at the risk of exposing crewmembers and travelers to flawed safety planes. I think that is really the goal. We have nonunion carriers that are doing it as well. So it is a bad situation.

Mr. GARCÍA. Mr. Perrone.

Mr. PERRONE. I got to put my glasses on because it is getting into that point.

We have domestically about 3,000 repair stations, foreign about 915, but that is growing rapidly. And the problem that we have, the concern is that the FAA has to have inspectors now travel overseas. And, again, with staffing issues, with money, Government shutdowns, that gets delayed or backlogged.

Also, the oversight, as we have said, they don't have the same standards as we do for domestic. So the folks that are working there are not at that same high level that we have in the United States.

Mr. GARCÍA. So how much maintenance work gets performed outside the U.S. now, if you know, and how much of that work would return to the U.S. if these safety gaps were closed, to either one of you?

Mr. SAMUELSEN. So one of the issues that is going on is that the FAA doesn't have a system for collecting data for problematic work that comes back from overseas. They simply don't collect the data.

So the only time the FAA receives data on it is if there is a problem that leads them to make specific inquiries of passenger air carriers, U.S.-flag carriers. And it is about 30 percent of the work is done overseas now. And that is up from 7 percent in 2003. So it is growing tremendously.

And the idea that this is somehow beneficial to American air travelers or to the safety of American air travelers is ludicrous. It is not beneficial at all. It is objectively less safe, yet the airlines keep increasing the amount of work they are doing overseas. And there is only one answer for that, and I said it before: It is profit.

Mr. GARCÍA. As you know, Congress has already directed the FAA to close these gaps. What next steps would you recommend we take to bring the Administration into compliance, in 30 seconds?

Mr. SAMUELSEN. Because the FAA has ignored Congress, they have just ignored Congress, there needs to be a moratorium on any more certification of foreign stations until the situation is under control.

Mr. GARCÍA. Mr. Perrone, anything else?

Mr. PERRONE. No, I agree. And I think, you know, touching on having an FAA Administrator would be beneficial. As you know, we have had an actor for a while. So that there should be somebody that is going to be in place that can hold the agency accountable to Congress' wishes.

Mr. GARCÍA. Thank you. We are now going into a second round of questions, so I would like to recognize Ranking Member Graves.

Mr. GRAVES OF LOUISIANA. Thank you.

Captain DePete, I want to follow up on a question earlier and just ask for a concise answer. So there were discussions earlier in the hearing about establishing an early warning system.

What I would like to understand is effectively what process, what opportunities are there in place now for your members to be able

to report or identify concerns related to safety? Does that make sense?

Mr. DEPETE. Yes, sir.

Mr. GRAVES OF LOUISIANA. OK. If we are creating an early warning system, basically what do we have now?

Mr. DEPETE. Actually, and you have helped a great deal here by the automatic acceptance of—because when these ASAP reports are filed, they get processed immediately or within a relatively short period of time, and they get analyzed. And before, under the previous rules, as you know, it took time to determine whether or not the report would meet the standards, with a few exclusions.

But now we know that that information is so critical to the functioning of the system to learn that early, as the early warning, that we will put aside whether or not it is to be accepted or not and provide the protections in the program.

We are more interested in seeing the data and making sure we get the data. So it has been a very significant, effective improvement in the past, so we have been really happy about that.

Mr. GRAVES OF LOUISIANA. I want to understand sort of where we are to understand, you know, sort of where we should go or where the deficiencies are. So I appreciate you bringing that up. Look, you have raised twice now in the hearing that the disparity between cargo and passenger on the fatigue issue, and I appreciate you raising the fatigue issue. It is something that I think is important that we continue to take a close look at and make sure that we understand.

I have a question for you, though. So I fly back and forth from New Orleans every week, and I know that we have some pilots that commute often with me, or I commute with them. How does that factor into fatigue? And I am curious because, you know, last night, I finished up at midnight 30, but I didn't go to bed until 2:15. So just because I had an opportunity to sleep, I didn't do it. I just want to understand how that factors in.

Mr. DEPETE. No, I am familiar with the question. And the committee of the ARC, the Aviation Rulemaking Committee, that handled this, actually looked at the issue. The issue of commuting was brought in. And many of our own—within our union, many of our own companies institute policies to ensure—when you show up for your job, whether you have driven 5, 10, you know, 5 or 10 hours to get to your base to take a flight, you are responsible when you sign for that flight to be fit to fly, period.

It is just that when they looked at the complexities of trying to figure out, well, did they drive, did they fly, did they that; it just became you had to stay within your normal allowable flight duty period, basically. And if you exceeded it, then you couldn't sign for the flight. So it was up to the pilot to make sure that he got himself in position, ready to fly and fit to fly.

The sad part about, you know, the cargo end of it is, is that last I looked I have the same physiology that any other pilot flies, regardless of what they fly. And that is where the real problem lies and the travesty in this, because we have got people who clearly, from a scientific point of view, are flying relatively impaired. And, obviously, it would have an effect on the total system. So it is just time. And I want to thank the NTSB, actually. They have been

longstanding supporters of ending the cargo carveout ever since Deborah Hersman's days.

Mr. GRAVES OF LOUISIANA. I appreciate the information. I want to better understand that issue, and you bring it up. Do you drive in or you drive long hours or what have you, and just making sure that we are not looking in a vacuum as we move forward.

Mr. Samuelsen, you have been pretty candid on the foreign servicing facilities. And I do appreciate your candor, because as we have talked about it, and I believe it was Captain Sully, who was here at the last hearing, talked about how we have got to look at every step in the process and not just become myopically focused on one thing. And I think it is important. And you are raising some really important concerns about safety and making sure that we have safety parity with repair and maintenance facilities. And I appreciate your candor.

I do want to ask a question, because I hear you talk about it. I know maybe a little bit outside your lane, but do you sense that it is a cultural safety issue, perhaps, at some of these other facilities, that they don't have the same culture of safety that you have with some of the facilities here?

Mr. SAMUELSEN. I think that is absolutely an element of it. I think there are countries, such as countries in the EU, that have extremely high safety standards and a safety culture that parallels American U.S. soil safety culture. But, certainly, there are countries that U.S.-flag carriers are sending work to that simply don't have the safety culture and don't view safety as the paramount reason for the maintenance work that is done on these planes.

Mr. GRAVES OF LOUISIANA. Thank you. And do you think that that culture of maybe lack of safety is limited to just the servicing, or do you think that that expands perhaps to other aspects of the airlines as well, including the pilots?

Mr. SAMUELSEN. I think that when you begin to compare the safety of culture within the United States, it is hard to match it. There are some countries that do. And I think it goes across the entire aviation industry, not just related to the technician work that we do on airplanes, on jets.

Mr. GRAVES OF LOUISIANA. Thank you.

And, Mr. Chairman, thank you very much. And I want to thank all of you for your commitment to your suggestions on safety. We have got to continue striving for perfection. Thank you.

Mr. GARCÍA. Thank you. Are there any further questions from Members of the subcommittee?

Seeing none, I would like to thank each of the witnesses for your testimony today. The contributions to today's discussion have been very informative and helpful.

I ask unanimous consent that the record of today's hearing remain open until such time as our witnesses have provided answers to any questions that may have been submitted to them in writing, and unanimous consent that the record remain open for 15 days for any additional comments and information submitted by Members or witnesses to be included in the record of today's hearing.

Without objection, so ordered.

No other Members having anything to add, the subcommittee stands adjourned.

[Whereupon, at 12:55 p.m., the subcommittee was adjourned.]

SUBMISSIONS FOR THE RECORD

Prepared Statement of Hon. Eddie Bernice Johnson, a Representative in Congress from the State of Texas

Thank you, Mr. Chairman.

It is with great appreciation that I thank the Chairwoman for holding this hearing today, as it allows us to examine aviation safety issues. Regarding the two Boeing 737 MAX aircraft tragic incidents, my interests are how we as a legislative body can adequately address challenges to aviation safety and potential avenues of reform in the Federal Administration Aviation (FAA) certification processes. Safety is key. No family should have to endure the experience that our witness in the first panel has faced.

I am eager to hear from the stakeholders serving on the second panel today about the safety and service challenges faced by the professional crews and passengers.

Currently, we are experiencing a crisis of trust in aviation safety. The importance of an appropriate certification process for large commercial aircraft in the United States is now more critical than ever. We must advocate for transparency when examining and considering reforms of FAA's certification processes.

As recently as 2015, the U.S. Department of Transportation's Inspector General issued a report identifying weaknesses in FAA's oversight of FAA certified overseas repair stations that work on U.S. air carrier fleets.

According to Mr. Samuelsen's written testimony, FAA has renewed certification of overseas repair stations in Thailand this past February even though the Civil Aviation Authority of Thailand failed 26 different metrics essential to aviation safety. This is very concerning.

Passengers flying in the U.S. expect their aircraft to meet U.S. safety standards, including when the aircraft undergoes repairs, whether the aircraft is serviced in the U.S. or any other country. That is a reasonable expectation. We, on this Committee, must make sure FAA implements the safety mandates in current law.

I look forward to hearing your testimony and solutions from stakeholders to improve aviation safety for professional crew and passengers.

Thank you. I yield back.

Prepared Statement of Hon. Donald M. Payne, Jr., a Representative in Congress from the State of New Jersey

I extend my sincere condolences to the families of these tragedies and cannot imagine the tremendous grief that you are experiencing. One life lost is too many and I am committed to a full and thorough investigation to ensure the safety of the 737 MAX before it is back in the air.

I commend Mr. Njoroge and Mr. Stumo for having the courage to speak before this committee in what certainly are difficult circumstances. As a father of three, the thought of harm coming to my children is unbearable. I look forward to hearing how we can better improve aviation safety.

I also look forward to engaging with aviation professionals to hear their opinions on how best to ensure that planes, passengers, and crew are safe during flights. I am committed to safe skies and am very supportive of this Committee's investigative efforts. While we cannot turn back the clock, but we can put policies in place that will hopefully prevent future tragedies from occurring.

APPENDIX

QUESTIONS FROM HON. EDDIE BERNICE JOHNSON FOR DANA SCHULZE, ACTING DIRECTOR, OFFICE OF AVIATION SAFETY, NATIONAL TRANSPORTATION SAFETY BOARD

Question 1. With regards to ensuring that outsourced maintenance and readiness of airplanes are completed in compliance with FAA standards:

a. Who is responsible for ensuring such compliance?

ANSWER. Regardless of where the maintenance is performed, the air carrier is ultimately responsible for the maintenance program, how the aircraft is maintained and the airworthiness of the fleet it operates. In addition, the FAA along with international regulatory agencies, would oversee the outsourced air carrier maintenance facilities.

b. What is the process to ensure such compliance?

ANSWER. The process for enforcing compliance with the standards is the responsibility of the FAA. The NTSB is responsible for investigating transportation accidents and issuing safety recommendations based on our findings.

c. What is the consequence for failure of compliance?

ANSWER. Enforcing compliance with the standards is the responsibility of the FAA. However, failure to comply with FAA standards can lead to tragic consequences, as proper airplane maintenance is critical to preventing accidents. Although the NTSB is a nonregulatory agency (and therefore cannot impose any legal penalties on an air carrier for failing to comply with FAA standards), we do investigate accidents in which lack of oversight at outsourced maintenance stations was a causal or contributing factor (for example, the ValuJet flight 592 crash in Miami, Florida, on May 11, 1996, which involved a domestic repair station, and the ValuJet flight 597 crash in Atlanta, Georgia, on June 8, 1995, which involved a foreign repair station).

QUESTIONS FROM HON. GARRET GRAVES FOR DANA SCHULZE, ACTING DIRECTOR, OFFICE OF AVIATION SAFETY, NATIONAL TRANSPORTATION SAFETY BOARD

Question 2. Ms. Schulze, to NTSB's knowledge, has maintenance performed at a foreign repair station certified by the Federal Aviation Administration under part 145 of Federal Aviation Regulations contributed to a commercial aircraft accident in the United States?

ANSWER. The National Transportation Safety Board (NTSB) has been conducting accident investigations and determining probable cause for 52 years, since 1967. One case in which NTSB determined that maintenance performed at a foreign repair station certified by the Federal Aviation Administration under Title 14 Code of Federal Regulations (CFR) Part 145 to be a probable cause in aviation accident occurred on June 8, 1995. That's when ValueJet Airlines flight 597, a Douglas DC-9, had an uncontained engine failure during takeoff from Hartsfield Atlanta International Airport in Atlanta, Georgia. The NTSB determined the probable cause to be " . . . failure of Turk Hava Yollari maintenance and inspection personnel to perform a proper inspection of a 7th stage high compressor disk . . . " However, the staff is not aware of additional cases in which maintenance by a foreign Part 145 maintenance facility was found to be causal or contributory to a 14 CFR Part 121 accident.

Question 3. Ms. Schulze, what recommendations has the NTSB made to improve the safety of commercial aviation conducting operations exempt from Part 135 and operating under Part 91 (e.g. certain air tours, skydiving flights, etc.)?

ANSWER. Aircraft operations conducted under Title 14 Code of Federal Regulations (CFR) Part 135 receive more oversight by the Federal Aviation Administration (FAA) than those operating under Part 91. This oversight covers all aspects of a carrier's operations, maintenance, flight crew training, and establishes higher qualifications for the flight crew. In addition, Part 135 carriers are required to use FAA ap-

proved operations specifications addressing multiple safety aspects of the conduct of flights.

Currently, 14 CFR Part 135.1 allows commercial air tour flights departing and returning to the same airport and flying within 25 miles of the airport to operate under Part 91. Based on the lack of oversight and required operations specifications the NTSB issued recommendation A-95-58 to the FAA to eliminate this exemption. The recommendation is classified as "Closed—Unacceptable Action."

> A-95-58: To the FAA, develop and implement national standards by 12/31/95, within 14 CFR Part 135, or equivalent regulations, for all air tour operations with powered airplanes rotorcraft to bring them under one set of standards with operations specifications eliminate the exception currently contained in 14 CFR Part 135.1.

The FAA's 2007 Commercial Air Tour final rule does require air tour operators under Part 91 to obtain a letter of authorization (LOA). However, the requirements for LOAs contained in the final rule are limited in their ability to subject air tour operators to requirements similar to operations specifications for Part 135 carriers.

The NTSB first issued significantly similar recommendation A-87-93 in 1987 to eliminate this exemption. It is classified as "Closed—Unacceptable Action/Superseded," as air tour crashes continued to be investigated and new recommendations issued.

> A-87-93: To the FAA, require all revenue air tour flights, regardless of the distance flown, to be subject to the regulatory provisions of 14 CFR Part 135, and not 14 CFR Part 91.

In 2008, the NTSB published a Special Investigation Report on the Safety of Parachute Jump Operations, which found that parachute jump operators, many of which advertise to the public and transport parachutists for revenue, are allowed to maintain and service their aircraft under Part 91 regulatory provisions that require little FAA oversight and surveillance. In addition, parachute operations pilots are not required to undergo operation-specific initial and recurrent training, including preflight, weight and balance, and emergency procedures training, or recurrent FAA examinations in the types of aircraft that they operate. To address these safety issues, we issued multiple recommendations to the FAA.

The FAA published revised guidance in advisory circulars (AC) 105-2E, which provides suggestions to improve sport parachuting safety. The FAA also revised Order 8900.1, to include maintenance and operation inspections, aircraft configuration authorization, flight manual supplements, placards, operational waivers, pilot certification and training, and parachute airworthiness. In addition, the FAA revised Order 1800.56, "National Flight Standards Work Program Guidelines," to include surveillance of any parachute operation aircraft under Part 91 conducting parachute operations in accordance with Part 105. Aviation Safety Inspectors must choose at least one airworthiness inspection and one operations inspection from a list of 10 inspection types (for example, one maintenance spot inspection and one operations ramp inspection).

We remain concerned, however, that operators of aircraft used in parachute jump operations are not required to develop and implement FAA-approved aircraft maintenance and inspection programs, as recommended. We also remain concerned that requirements for pilots of parachute operations are not consistent with those for other revenue-based operations pilots, such as the requirements for pilots flying on-demand operations under Part 135. The recommendations below are classified as "Closed—Acceptable Action" (CAA) and "Closed—Unacceptable Action" (CUA).

> A-08-63: To the FAA, require parachute jump operators to develop and implement Federal Aviation Administration-approved aircraft maintenance and inspection programs that include, at a minimum, requirements for compliance with engine manufacturers' recommended maintenance instructions, such as service bulletins and service information letters for time between overhauls and component life limits. (CUA)
>
> A-08-64: To the FAA, develop and distribute guidance materials, in conjunction with the United States Parachute Association, for parachute jump operators to assist operators in implementing effective aircraft inspection and maintenance quality assurance programs. (CAA)
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> A-08-65: To the FAA, require parachute jump operators to develop initial and recurrent pilot training programs that address, at a minimum, operation- and aircraft-specific weight and balance calculations, preflight inspections, emergency and recovery procedures, and parachutist egress procedures for each type of aircraft flown. (CUA)

A-08-66: To the FAA, require initial and recurrent pilot testing programs for parachute jump operations pilots that address, at a minimum, operation- and aircraft-specific weight and balance calculations, preflight inspections, emergency and recovery procedures, and parachutist egress procedures for each type of aircraft flown, as well as competency flight checks to determine pilot competence in practical skills and techniques in each type of aircraft. (CUA)

A-08-67: To the FAA, revise the guidance materials contained in Advisory Circular 105 2C, Sport Parachute Jumping, to include guidance for parachute jump operators in implementing effective initial and recurrent pilot training and examination programs that address, at a minimum, operation- and aircraft-specific weight and balance calculations, preflight inspections, emergency procedures, and parachutist egress procedures. (CAA)

A-08-68: To the FAA, require direct surveillance of parachute jump operators to include, at a minimum, maintenance and operations inspections. (CAA)

The NTSB also issued recommendations to address safety issues specific to commercial balloon operations. These were identified based on its investigation of a 16-fatal balloon accident on July 30, 2016 in Lockhart, Texas, which was operated as a Part 91 sightseeing passenger flight. NTSB safety recommendations A-17-34 and A-17-45 addressed a lack of medical oversight for commercial balloon pilots and a lack of targeted FAA oversight of potentially risky commercial balloon operations. We thank Congress for addressing the gap in medical certifications identified in A-17-34, which should be closed once the FAA issues regulations required by section 318 of the FAA Reauthorization Act of 2018 (Public Law 115-254). Currently, Safety Recommendations A-17-34 and -45 are classified "Open—Acceptable Response."

A-17-34: To the FAA, remove the medical certification exemption in 14 Code of Federal Regulations 61.23(b) for pilots who are exercising their privileges as commercial balloon pilots and are receiving compensation for transporting passengers.

A-17-45: To the FAA, analyze your current policies, procedures, and tools for conducting oversight of commercial balloon operations in accordance with your Integrated Oversight Philosophy, taking into account the findings of this accident; based on this analysis, develop and implement more effective ways to target oversight of the operators and operations that pose the most significant safety risks to the public.

Further, the NTSB has recommended that all Part 91, in addition to Part 135 and 121, operated turbine-powered aircraft be installed with crash-resistant flight recorder systems that include cockpit audio and images, if they do not already have a flight recorder.

Since these recommendations were issued, the FAA has maintained that it is unable to develop the recommended requirement for recorders because it has been unable to develop a cost-benefit analysis (CBA) to justify a recorder mandate. The FAA told us that the benefits of recorders are difficult to identify and quantify because the absence of a recorder will never cause an accident.

However, on July 20, 2017, the FAA stated it was working to develop a preliminary CBA associated with these safety recommendations to determine if pursuing rulemaking is cost beneficial. In our October 2, 2017, letter, we told the FAA that an adequate evaluation of these recommendations should include reviewing safety improvements that would not have been identified without recorder data. The evaluation should also acknowledge the number of investigated accidents in which the probable cause included "for unknown reasons." As part of our response, we supplied to the FAA an analysis listing accidents in the NTSB database from 2005 through 2017 that involved turbine-powered, nonexperimental, nonrestricted-category aircraft and in which flight crew were killed. Of the 185 accident aircraft, 159 had no form of recording equipment, and all 159 aircraft without recorders were advanced with complex systems that are typically much more difficult to investigate when there is a lack of information. Of the 159 accidents involving aircraft without recorders, 18 had probable cause determinations that contained "unknown." Pending responsive action from the FAA, Safety Recommendations A-13-12 and -13 are currently classified "Open—Acceptable Response."

A-13-12: to the FAA, require the installation of a crash-resistant flight recorder system on all newly manufactured turbine-powered, nonexperimental, nonrestricted-category aircraft that are not equipped with a flight data recorder and a cockpit voice recorder and are operating under 14 Code of Federal Regulations Parts 91, 121, or 135. The crash-resistant flight recorder system should record cockpit audio and images with a view of the cockpit environment to in-

clude as much of the outside view as possible, and parametric data per aircraft and system installation, all as specified in Technical Standard Order C197, "Information Collection and Monitoring Systems."

A-13-13: To the FAA, require all existing turbine-powered, nonexperimental, nonrestricted-category aircraft that are not equipped with a flight data recorder or cockpit voice recorder and are operating under 14 Code of Federal Regulations Parts 91, 121, or 135 to be retrofitted with a crash-resistant flight recorder system. The crash-resistant flight recorder system should record cockpit audio and images with a view of the cockpit environment to include as much of the outside view as possible, and parametric data per aircraft and system installation, all as specified in Technical Standard Order C197, "Information Collection and Monitoring Systems."

QUESTIONS FROM HON. EDDIE BERNICE JOHNSON FOR CAPTAIN JOSEPH G. DEPETE, PRESIDENT, AIR LINE PILOTS ASSOCIATION, INTERNATIONAL

Question 1. With regards to ensuring that outsourced maintenance and readiness of airplanes are completed in compliance with FAA standards:

a. Who is responsible for ensuring such compliance?

ANSWER. Any maintenance done on a N-registered (U.S. registered) aircraft must be done by an FAA certificated repair station and the work performed must be signed off on by an FAA licensed inspector. The work performed does not need to be performed by an FAA licensed mechanic, but it must be signed off and approved by a FAA licensed Inspector. This is the process utilized in the United States as well.

b. What is the process to ensure such compliance?

ANSWER. The airline is the first level of compliance and the FAA the second and higher level of oversight to ensure compliance. FAA does random and scheduled inspections of the facilities as does the airline.

c. What is the consequence for failure of compliance?

ANSWER. Penalty is the loss of the FAA Certificate and License, fines, and loss of contracts.

QUESTIONS FROM HON. GARRET GRAVES FOR CAPTAIN JOSEPH G. DEPETE, PRESIDENT, AIR LINE PILOTS ASSOCIATION, INTERNATIONAL

Question 2. Captain DePete, voluntary safety reporting systems are an important component of ensuring the safety of the aviation system. Can you describe the all the voluntary reporting programs and data sharing systems currently in use here in the United States?

ANSWER. Voluntary reporting systems are "early warning systems" which allow us to identify and address issues before they become serious incidents or accidents. There are three programs which illustrate the importance of these systems. The Aviation Safety Action Program (ASAP) is an important program at all 14 CFR Part 121 operators. ASAP provides employee reporter and airlines with the necessary protections and de-identification capabilities so that pilots can submit safety concerns as frequently as is necessary to ensure that all safety issues are being shared.

ASAP reports are evaluated by airline pilot representatives, airline management, and FAA inspectors. Together they decide what actions are needed to address the safety concern, and the actions are assigned to address the shortfall. (Congress made a significant improvement in voluntary safety reporting by requiring ASAP reports to be automatically accepted for evaluation, which allows action on possible safety threats in a more-timely manner. ALPA commends Congress for this action.)

Another critically important program is FOQA—Flight Operations Quality Assurance. FOQA monitors data—flight parameters—from the aircraft and allow the airline and FAA to monitor flight operations in near real time and look for anything that would appear to be "unusual" or out of the norm with respect to the standard, expected, operation of an aircraft.

The ASAP and FOQA programs are also used to evaluate trends within the airline, to ensure that repeated safety events do not occur. The de-identified safety reports are sent to a central repository called Aviation Safety and Information Analysis and Sharing (ASIAS). The ASIAS program looks for trends and issues across the 14 CFR Part 121 airline industry. The extensive use of ASAP reports and FOQA data for individual safety improvements, improvements of the operations at the airline enterprise level, as well as systemic safety enhancements at the national level is clearly evidence of the importance of these voluntary safety reporting programs.

Question 3. Why are proactive, voluntary reporting systems superior to mandatory reporting systems and how have they improved safety in the National Airspace System?

ANSWER. The voluntary nature of proactive reporting systems is critical to ensuring that there is a foundation of trust between the FAA (the regulator), management (airlines) and front-line employees. The regulator must trust that the airline and employees are reporting regularly. The airlines must trust that the regulator will not impose sanctions on the operator for unsafe practices even when the operator takes the initiative to eliminate the safety risk, and the front-line employees must trust that the operator and the regulator will not use safety data reports to take certificate action or employee punitive steps against them. If any one of the organizations refuses to participate in the voluntary safety programs, they can expect the other parties in the program to negatively react to their actions. The three-way arrangement of trust by all three parties ensures that all have more to lose by not participating, than they do by participating.

Converting ASAP to a mandatory reporting program would invoke punitive actions for failure to comply with the mandatory reports and would likely result in employees withholding or "watering down" the safety data reporting to temper the potential negative impacts of submitting the safety report. It is important to remember that reports from "frontline employees" are approximately 90% sole-source reports, meaning that only the reporter knows of the event/issue. Without the trust created through these voluntary reporting programs the sole-source reports will disappear because of fear created due to loss of trust. The airlines would also work to avoid submitting mandatory safety reports to the regulator, and the regulator would be forced to become much more investigatory in nature, and focus on rule infractions (i.e. policing) instead of focusing on the overall safety culture and safety mindset of the airline operation. Most if not all involved in ASAP believe that mandating safety reporting would be a step backwards in the safety risk mitigation efforts at a local and national level.

QUESTIONS FROM HON. EDDIE BERNICE JOHNSON FOR LORI BASSANI, NATIONAL PRESIDENT, ASSOCIATION OF PROFESSIONAL FLIGHT ATTENDANTS

Question 1. With regards to ensuring that outsourced maintenance and readiness of airplanes are completed in compliance with FAA standards:

a. Who is responsible for ensuring such compliance?

ANSWER. Compliance with FAA maintenance standards is a three-part responsibility falling on the FAA, the operator, and the certified workers on the line. The FAA is always short-handed when it comes to inspectors so considerable responsibility rests with the operator's on-site quality assurance team as well as on the actual workers and the systems they have in place to ensure correct work is always done.

In the case of offshore repair facilities, it is our understanding that the FAA conducts considerably less oversight. While this oversight includes an annual visit, the visit is announced in advance, giving the facilities time to prepare and thus limiting oversight effectiveness.

b. What is the process to ensure such compliance?

ANSWER. The system in place has worked well for domestic repair stations. In the U.S., the FAA is aggressive in the oversight, their inspections are usually unannounced, and the line workers understand that the oversight from the FAA and from the operator is thorough and intense.

The FAA oversight of foreign repair stations is considerably less intense. Unannounced inspections are rare and worker certification is largely non-existent which puts great pressure on the operator's quality assurance team overseeing the work to see that it is done right.

c. What is the consequence for failure of compliance?

ANSWER. The aviation safety community in the U.S. relies on a layered approach with the involved responsible parties obligated to oversee their own work and to speak out when something is not right. The FAA oversight role could be strengthened but real attention should be on the proliferation of offshore repair facilities. The FAA must be given more resources to increase the number of inspectors for all offshore stations, increase the number of inspections, and make them unannounced.

QUESTIONS FROM HON. EDDIE BERNICE JOHNSON FOR MICHAEL PERRONE, PRESIDENT, PROFESSIONAL AVIATION SAFETY SPECIALISTS, AFL–CIO

Question 1. With regards to ensuring that outsourced maintenance and readiness of airplanes are completed in compliance with FAA standards:

a. Who is responsible for ensuring such compliance?

ANSWER. While it can depend on the individual relationship of a company or individual with the FAA, the FAA is responsible for overseeing the safety of the entire aviation industry. The issue is that in recent years FAA aviation safety inspectors have experienced a dramatic shift in how they conduct oversight. Inspectors who used to once go out and kick the tires, conduct hands-on safety oversight and experienced strong relationships with the industry they oversaw are now essentially overseeing paperwork submitted by industry stating that standards set by the FAA are being met. The shift in the nature of oversight has led to an agency that is assessing risk but no longer directly oversees compliance with safety regulations while the industry is vouching for itself.

b. What is the process to ensure such compliance?

ANSWER. The FAA will often work with industry stakeholders to develop safety standards and protocols throughout the certification process. Aviation safety inspectors and engineers are often tasked with ensuring compliance with these standards. But with a growing aviation industry and stagnant inspector staffing over the last decade, oversight has largely been handed over to industry where manufacturers are allowed to oversee themselves and inspectors oversee hundreds of designees at a time.

c. What is the consequence for failure of compliance?

ANSWER. Depending on the severity of the failure, consequences could range from requests for corrective action to be taken, fines, delays bringing a product to market or revocation of certification.

QUESTIONS FROM HON. EDDIE BERNICE JOHNSON FOR JOHN SAMUELSEN, INTERNATIONAL PRESIDENT, TRANSPORT WORKERS OF AMERICA

Question 1. With regards to ensuring that outsourced maintenance and readiness of airplanes are completed in compliance with FAA standards:

a. Who is responsible for ensuring such compliance?

ANSWER. Compliance for maintaining FAA standards is generally a joint responsibility of the FAA, the air carrier, and the workers. In the U.S., this system has worked relatively well, with highly qualified, certified mechanics performing safety sensitive work and an engaged FAA physically present in all of the largest airports and maintenance repair facilities. Outside of the U.S., however, this question becomes significantly more complicated.

At foreign repair facilities, the minimum standards for maintenance workers are, in most cases, non-existent. These workers are not required to have any FAA-certification or any familiarity with the aircraft they may be performing maintenance on. Additionally, the FAA has no regular presence at these foreign facilities. There are no quality controls in place from the regulator to ensure that foreign facilities maintain U.S. minimum standards.

Ultimately, without real oversight from the FAA or qualified, certified workers at these facilities, 100% of the compliance responsibility has been vested in the airline itself. In many cases, the airline then outsources this responsibility to a contractor—further weakening the relationship between safety standards and reality.

b. What is the process to ensure such compliance?

ANSWER. While, at least on paper, there is a robust system for ensuring compliance inside of the U.S., almost all of these processes break down or cease to exist at foreign facilities. In the U.S., FAA inspectors make frequent, unannounced inspections of maintenance facilities—both at overhaul bases and at airports. Certified mechanics who fail to maintain safety standards are at risk of losing their FAA credentials—potentially costing them their job, as well. Carriers who do not correct systemic problems can be fined or lose their certification.

Outside of the U.S., the FAA does not conduct unannounced inspections. In fact, foreign repair facilities are subject to only one scheduled inspection each year. Line maintenance performed at airports outside of the U.S. is not subject to *any* FAA inspections.

Furthermore, the vast majority of workers performing maintenance on aircraft outside of the U.S. have no certification—either from the FAA or any equivalent agency. There is no risk to these workers of losing their license to operate if they fail to safely maintain equipment.

In short, the entire process of ensuring compliance with FAA regulations at foreign facilities is dependent on *one* scheduled inspection per year and a trust that the airlines will police themselves.

c. What is the consequence for failure of compliance?

ANSWER. Failure to comply with safety regulations can have dire consequences for the travelling public. Our safety regulations have often been written in blood following fatal accidents due to poor maintenance. The incredible safety record of the U.S. airspace over the past decade is a result of a century of learning from our mistakes. Stepping back from these regulations would open our airspace to significant safety threats.

Today, our U.S. mechanics have become a last line of defense against these threats. Across the country, line maintenance mechanics are finding examples of poor and failed repair work on aircraft maintained abroad. Foreign repair facilities have approved aircraft to return to service with tape and wire holding vital engine components together; exit doors installed incorrectly that caused depressurization mid-flight; flammable paint around the engines; and secret drug-smuggling compartments installed in the aircraft nose. Every mechanic that spots and corrects these maintenance failures is protecting the travelling public from life-threatening system failures.

However, the airlines are clearly finding financial advantages to non-compliance. U.S. carriers have more than tripled the proportion of their maintenance performed outside of the country in the past fifteen years. This maintenance is being performed on a significantly lower safety standard without qualified mechanics or FAA quality controls. Day-to-day, the carriers are not facing any consequences for failing to live up to our national minimums. Without action by Congress, these airlines will continue a race to the bottom in airline maintenance that is exposing U.S. citizens to significant, pervasive safety risks.

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