



As you know, recent advances in automation and other new technologies have led some airline industry groups to consider the possibility of reducing the number of crewmembers on the flight deck, entertaining the idea of single-pilot or even remote-pilot operations. We believe these ideas ignore the important role that pilots physically present on the flight deck serve in the safe operation of their aircraft.

A pilot in command of the flight deck of a modern airliner is there because of hard work, professional training, thousands of hours of flight experience, and demonstrated judgement proven over time. That's not something you can replace with a computer. And a pilot sitting in a remote location somewhere just doesn't have the necessary perspective that's required to do the job.

It's our responsibility to make sure that the drive to use new technology doesn't overcome common sense. We owe it to everyone who travels by air to maintain the high level of safety we've fought so hard to achieve.

Attached is ALPA's nine-part educational series that ran last year in *Air Line Pilot* spotlighting the dangers of altering current flight crew standards and crew complement.


Capt. Jason Ambrosi
ALPA President



ALPA staunchly advocates that the most vital safety feature on any airliner is having two experienced, well-trained, and well-rested pilots on the flight deck.

on board airliners—possibly down to even a single pilot—simply to reduce costs. ALPA, widely regarded as “the conscience of the airline industry,” is adamant that both single-pilot operations and reduced-crew operations would compromise safety, posing an unacceptable risk.

CREW COMPLEMENT

The subject of crew complement has long been a topic of discussion and debate in the airline industry. When the first B-737s rolled off the production line in the late 1960s, Boeing required a three-person crew—captain, copilot, and flight engineer—due in part to ALPA’s policy regarding crew complement. Although B-737s were designed with far more automation than previous airliners, ALPA made the safety case to keep the additional set of eyes, ears, and hands on the flight deck as a safeguard in the event of crew incapacitation or high-workload situations, like approaches to minimums, go-arounds, diversions, or instrument failures. Only after the concept of a two-person crew was rigorously tested and proven to be safe did the Association agree to what is now the industry norm—two pilots on the flight deck.

But the real question is: Why is this critical safety issue being discussed now?

Special-interest groups focused only on the bottom line believe that reducing the number of pilots on the flight deck will lower labor costs. Removing the safeguard of a second pilot or potentially both pilots effectively may decrease labor costs, but this action comes at the expense of safety.

AN UNACCEPTABLE EXCEPTION

A target for those looking to put cost cutting in front of safety has and continues to be all-cargo operations. Due to a flawed cost-benefit methodology, safety regulations that apply to passenger-carrying operations have *not* been applied to all-cargo operations. Pilots who fly for

AVIATION’S SAFEGUARD: TWO PILOTS ALWAYS ON THE FLIGHT DECK

PART 1

By Christopher Freeze, Senior Aviation Technical Writer

“Today’s professional pilots have earned the stripes atop their shoulders through hard work, countless hours of study, and wisdom gained through vital experience. No computer or pilot in a remote setting can match an onboard pilot’s dedication to making each flight better than the last.”—Capt. Joe DePete, ALPA President

Editor’s note: Exposing the dangers of single-pilot operations has been and will continue to be an ALPA priority. In this nine-part series, Air Line Pilot will educate, inform, and advocate support for maintaining the most vital aircraft safety feature: two experienced, well-trained, and well-rested professional pilots on the flight deck.

Today, airliners are designed with important redundancies and safeguards. One redundancy that likely comes to mind are an aircraft’s two engines. But undoubtedly the most important safety feature on an airliner are two experienced, well-trained, and well-rested pilots on the flight deck. Professional aviators have contributed to the safest period of commercial passenger aviation, and airline travel continues to be the world’s safest mode of transportation.

Yet some continue to push for reducing the number of flightcrew members

all-cargo operations were notably “carved out” from the updated science-based flight-time/duty-time rules of FAR Part 117, and cargo pilots don’t always have access to aircraft rescue and firefighting resources at airports due to the hours that all-cargo operations take place.

The U.S. House of Representatives passed a provision in the FAA Reauthorization Act of 2018 supporting a program to eliminate pilots from cargo airliners. This provision, part of a separate bill known as the FLIGHT R&D Act, was added by the House Science, Space, and Technology Committee without a hearing, markup, or debate in any congressional forum. The proposal would have authorized a new program and funding for research, development, and implementation of single-pilot or remote-piloting cargo operations in commercial aviation using taxpayers’ dollars.

ALPA launched a Call to Action in opposition to the provision that resulted in more than 5,000 communications to Congress in just 48 hours. Ultimately, members of Congress responded to the will of their constituents and removed the language from the final bill.

However, the FAA Reauthorization Act of 2018 is in effect only through Sept. 30, 2023. The next FAA reauthorization could contain similar language that seeks to undermine safety yet

READ MORE

To learn more about the safety benefits of two experienced, well-trained, and well-rested professional pilots on board an airliner, read

- ALPA’s white paper “The Dangers of Single Pilots Operations” at alpa.org/nosinglepilot.
- the 2018 public survey “Few Would be Comfortable with Flying on Pilotless Airliners” at [Bit.ly/Refuse_to_Fly](https://bit.ly/Refuse_to_Fly).
- the 2017 NASA study “An Assessment of Reduced Crew and Single Pilot Operations in Commercial Transport Aircraft Operation” at [Go.nasa.gov/33RPm9y](https://go.nasa.gov/33RPm9y).

again. ALPA will continue to lead the charge to ensure that any provisions that undermine safety are not included.

While the U.S. has withheld public funds to explore this type of program, elsewhere in the world companies like Airbus are looking to make inroads. At the Dubai Airshow in November 2021, the company unveiled its A350 freighter, which according to Airbus’s CEO could be a “candidate” for single-pilot operations.

The aircraft manufacturer reported that the highly automated Airbus freighter won’t make its debut until later in the decade when the company hopes to broaden its capabilities in the single-pilot realm. But Airbus’s intentions are clear, and other companies like Honeywell, Dassault, and Xwing are all actively working on projects to

increase flight deck automation that would reduce workload and potentially the number of flightcrew members aboard to safely operate an aircraft—or eliminate the crew completely.

PILOTS = SAFETY

“The past decade is proof positive of how pilots have helped make commercial aviation the safest mode of transportation in the world,” DePete remarked. “Today, millions of passengers and tons of cargo travel to destinations around the globe with ease and with little concern of arriving safely, thanks to the tremendous efforts of aviation professionals.”

ALPA will continue to staunchly advocate that the most vital safety feature on any airliner is having two experienced, well-trained, and well-rested pilots on the flight deck. 🌐

SUPERIOR AIRMANSHIP

Day and night, pilots safely transport passengers and cargo to their destinations, routinely performing the expected. They also safely manage the unexpected when situations arise. To honor those flight crews that have experienced unexpected and extraordinary events while piloting their aircraft, ALPA bestows upon them its Superior Airmanship Award.

In each article of this nine-part series, *Air Line Pilot* is highlighting an incident from the past in which flight crews—



F/O J.L. Bellmer, left, and Capt. James Robertson receive ALPA’s Superior Airmanship Award.

working as a team—used their knowledge, skills, and abilities to make the difference between a safe landing and the unthinkable alternative.

On April 21, 1984, Eastern Airlines Flight 494 had just departed Atlanta, Ga., for Greensboro, N.C., when a faulty right thrust reverser inadvertently swung open, causing the DC-9 to roll uncontrollably to the right. Quickly, the flight crew—Capt. James Robertson and F/O J.L. Bellmer—shut down the No. 2 engine and managed to initiate a slow, climbing turn just above stall speed. They

returned to the airport and executed a safe landing of their crippled aircraft. There was no procedure, either emergency or abnormal, outlining the steps the flight crew should follow in this situation. This is one of the few recorded instances of an aircraft recovering safely from the unintentional deployment of reverse thrust on one engine during flight.

It was later discovered that the hydraulic system that normally keeps the thrust reversers in place had malfunctioned, and backup safety latches were defective.



AVIATION'S SAFEGUARD: TWO PILOTS ALWAYS ON THE FLIGHT DECK

PART 2

By Christopher Freeze, Senior Aviation Technical Writer

"ALPA staunchly advocates that having two experienced, well-trained, and rested pilots on the flight deck is the most critical safety feature on any airliner. Trained for life, pilots have helped make commercial aviation the safest mode of transportation in the world. The Association will continue to push back against those who seek to reduce—or eliminate completely—this vital safety feature."

—Capt. Joe DePete, ALPA President

At the start of this year, on the heels of an international air show, news media outlets carried sensational headlines irresponsibly reporting that the notion of reduced crew operations for aircraft was just around the corner. The articles, largely borrowing from a single story from a major news channel, cherry-picked findings from a 2014 NASA study on single-pilot operations that suggested that a reduced crew transition could "provide operating cost savings while maintaining a level of safety no less than conventional two-pilot commercial operations."

ALPA is no stranger to leading the safety charge when up against a profit-minded motive. Even before new first officer qualification and training regulations were enacted in 2013, they came under assault by special interests focused not on safety but the bottom line. And these rules still are being challenged today; however, ALPA continues to push back against those who seek to weaken these important safety regulations.

In addition, flag-of-convenience air carriers and atypical employment practices continue to proliferate in

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the global marketplace, undermining labor relations, aviation safety, and the stability of the domestic airline industry. The Association and its allies continue to advocate against such schemes.

But the startling vision of József Váradi, CEO of Hungarian low-cost airline Wizz Air, goes beyond an attempt to weaken regulations and labor laws—it's a direct assault on safety. In 2018 upon receiving his CAPA Airline Executive of the Year Award, Váradi commented that his vision for success—high productivity, low costs, low fares, and the highest profit margins—would be accomplished by using "robotic pilots."

Váradi is certainly not alone in the quest to achieve increased profits. For decades, airline CEOs have been crunching numbers to maximize value for owners and shareholders. With that in mind, Boeing laid the groundwork for its push into autonomous flight with its purchase of Aurora Flight Sciences,

a manufacturer of aerial drones and pilotless flying systems. In 2019, Aurora performed its first successful test flight of an autonomous passenger air “flying car” prototype, complete with a controlled takeoff, hover, and landing.

In 2020, Airbus successfully concluded its Autonomous Taxi, Takeoff, and Landing (ATTOL) project with a series of six test flights of an A350-1000 XWB, each one including five takeoffs and landings per run, to assess autonomous flight capabilities.

“The ATTOL project was initiated by Airbus to explore how autonomous technologies... could help pilots focus less on aircraft operations and more on strategic decision-making and mission management,” the company said in a press release. “Airbus is now able to analyze the potential of these technologies for enhancing future aircraft operations, all the while improving aircraft safety, ensuring today’s unprecedented levels are maintained.”

In April 2021, Xwing, a startup company developing technologies for self-flying aircraft, completed what it called the world’s first fully autonomous demonstration flight of a commercial cargo aircraft from gate to gate when a converted Cessna Grand Caravan 208 pulled away from Xwing’s hangar in Concord, Calif., taxied, took off, landed, and returned to the gate entirely on its own.

According to Xwing officials, autonomous aircraft address the “potential shortage of pilots” in the coming years, and they anticipate that fully autonomous cargo airplanes will be completing deliveries within the next few years. In response to the company’s application for an FAA Part 135 certificate for a cargo operator, ALPA provided substantial comments to the FAA docket regarding concerns about this aircraft.

In testimony before the U.S. House of Representatives Committee on Transportation and Infrastructure on the topic, Capt. Bob Fox, ALPA’s first vice president and national safety coordinator, stated, “We’ve documented many technical, regulatory, and financial barriers that indicate that single-pilot operations are a nonstarter either financially or due to safety and operational factors. More importantly, our continued record of safe landings clearly demonstrates that fewer than two pilots on commercial airliners is a threat to aviation safety and the concept should be shelved permanently.”

During the Association’s recent

Leadership Training Conference, Fox observed, “This is a technology that virtually no one is asking for, but some think it’s the magical salve that will ensure profits even in a down economy. As such, it represents a clear and present danger to our profession.” He remarked that NASA research found that automated flight was not close to being ready for even test operations and noted the Association’s successful efforts to remove Section 744 of the FAA Reauthorization Act of 2018 that would have established a research and development program in support of single-piloted cargo aircraft.

ALPA asserts that government funding of single-pilot operations is poor use of limited federal budget resources and that there are far better investments to be made in the industry’s future, including speeding the completion of NextGen—which the implementation of reduced crewing would disrupt—and funding research that will lead to safer, more fuel-efficient, faster, quieter, and more environmentally friendly aircraft. These initiatives will have a much great-

er long-term benefit on the air transportation system.

Apart from the NASA study, the federal government has been largely silent on the topic. But private industry has made a major push in the news media to share technological strides to remove pilots from an airline flight deck. Some of this technology is still federally supported by the Defense Advanced Research Projects Agency, which allows government-funded technology to be used for commercial applications.

While these companies extoll the advantages of their work—expanding automation to decrease pilot workload, supplementing the aviation workforce, and applying military technology to the commercial sector—they fail to recognize the fundamental truth that ALPA, “the conscience of the airline industry,” knows firsthand: the skills, experience, and professionalism of airline pilots can’t be replaced with computer servos and software without compromising the safety and security of delivering passengers and cargo to their destinations. 🌐

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Capt. Terry VanHoose, left, and F/O Mark Moser.

Capt. Terry VanHoose and F/O Mark Moser were piloting ExpressJet Flight 4291 from Houston, Tex., to San Luis Potosi, Mexico, on May 11, 2015, facing a challenging flight ahead as extreme weather covered most of the flight path.

The crew had flown around areas of deteriorating weather when they began to see anomalies in their flight instruments. As the crewmembers evaluated the situation, they quickly realized that they’d lost both of

their air data computers, meaning that many of their flight instruments were unreliable, and their standby airspeed indicator stopped functioning.

VanHoose took the controls and asked Moser to run the appropriate troubleshooting procedures. With multiple faults present, VanHoose’s experience led him to identify the most likely starting point, and he instructed Moser to run the Quick Reference Handbook procedure associated with an unreliable airspeed.

Complicating matters, severe thunderstorms were in the vicinity. Flying in instrument conditions, the flight crew acted swiftly, diverting to San Antonio International Airport, where the Embraer 145 touched down without incident, and saved the lives of those aboard the 50-passenger jet.



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gether to ensure success. Ask any pilot what ranks among their greatest challenges while flying and they'll most likely say managing unexpected occurrences like unforecasted weather, avoiding other aircraft, and emergency situations.

In short, an autonomous or reduced-pilot system can have perfect awareness of an aircraft's situation and still fail to communicate a problem or develop a viable solution. Having two pilots on the flight deck is necessary to handle the tasks involved in flying an airliner, as a wealth of objective evidence shows that single-pilot operations significantly increase pilot workload to the point that safety is compromised due to an accompanying increase in mistakes and task shedding.

A September 2017 NASA paper on the effects of single-pilot operations illustrates this danger to safety. The paper describes a NASA/FAA experiment involving 36 pilots who flew seven flight scenarios aboard a B-737-800 flight simulator—only one scenario of which was nominal—under two-crew, single-pilot, and reduced-crew conditions. The experiment found that pilot workload increased significantly under single-pilot operations in the off-nominal scenarios, which ranged from benign hydraulic leaks to more serious issues such as dual-generator failures. The experiment found a direct correlation between the increased workload and the incidence of pilot errors, with a resulting decrease in overall safety, but offered no remedy to overcome these issues—outside of having two pilots on board.

One proposed solution to offset this increased workload is the use of ground-based pilots. However, an earlier NASA task analysis published in 2015 shows that such assistance doesn't sufficiently offset the workload increase encountered under single-pilot operations. This task analysis found that under off-nominal conditions, such as a flight diversion,

AVIATION'S SAFEGUARD: TWO PILOTS ALWAYS ON THE FLIGHT DECK

PART 3: A RISKY EXPERIMENT

By Christopher Freeze,
Senior Aviation Technical Writer

"Safety is our business. And thanks to the unmatched professionalism and dedication of every pilot flying today, we continuously celebrate our role in maintaining the safest form of transportation today. But to think that someone on the ground, potentially thousands of miles away, or the cold circuits of a computer can match the awareness or responsiveness of two pilots on the flight deck is, at best, a foolhardy notion that presents an unnecessary risk for everyone."

—Capt. Joe DePete, ALPA President

As more experiments in autonomous flight are being made public, and more manufacturers look to form partnerships to get a foothold in this potential

market, there's a long road ahead before such modes of transport can match the safety record of today's air transportation system. And that road would require the flying public to become participants in an experiment with no assurances of success or safety. This is a risk no one should have to take.

While recent milestones like the first flight of an autonomous Black Hawk helicopter in February have inspired imaginations and made headlines, the fact is that these tests are done in highly controlled—almost laboratory-type—environments that have been rehearsed and programmed. This sterile airspace presents few challenges to overcome as they've been reduced or removed alto-

the number of tasks for an onboard pilot assisted by ground-based pilots increased by as much as 24 percent in comparison to the amount normally handled by the captain during standard-two pilot operations. Furthermore, to make financial sense as a replacement for standard two-pilot operations, ground operators (pilots) would have to be responsible for multiple aircraft at any given time. However, according to a NASA experiment that examined this approach, pilots can have difficulty compartmentalizing issues faced by these different aircraft.

Moreover, a 2017 NASA/FAA study on single-pilot and reduced-crew operations further indicates that single-pilot operations aren't "acceptable" in an emergency because of increased pilot workload: "The pilots could overcome the circumstances presented, but rated the workload, safety, and acceptability as being unacceptable in an emergency condition. There were notable flight performance decrements during [single-pilot operations] compared to two-crew operations that suggest unacceptable reduced safety margins." Assistance or intervention by a ground pilot would also be complicated by communications transmission delays introduced by the necessary signal encryption. Without such encryption, these signals would be at risk for tampering by unauthorized actors. And even when encrypted, access can still be compromised.

This is why history shows that having at least two fully qualified, highly trained, and well-rested pilots on the flight deck is an airliner's strongest safety asset. Pilots' knowledge and previous experiences serve as guidance and fuel motivation to effect a positive outcome to any scenario. Numerous emergencies have, according to computer simulations, been nonsurvivable. And yet, airline pilots have made a difference when computers indicated it was impossible.

Of course, pilots are human and subject to the laws of nature; therefore, having two pilots on the flight deck is the only reliable defense against the possibility that one becomes incapacitated during flight. Though the odds of a pilot becoming incapacitated or impaired in flight are statistically very low, the sheer volume of commercial air traffic globally translates into multiple incidents each year. In standard two-pilot operations, a key responsibility of the pilot not flying—the pilot monitoring—is to monitor

the pilot who is flying the aircraft for errors or decline in cognitive capability.

In single-pilot operations, this critical redundancy layer is lost. The ability to reliably monitor pilot health using automated systems will require significant advances in technology, and a ground-based pilot who may be juggling multiple aircraft at any given time simply can't respond as quickly to a situation in which the onboard pilot becomes incapacitated as would a co-located pilot. And while it's assumed that a ground-based pilot would take control of the aircraft if the onboard pilot becomes incapacitated, this pilot would then become unavailable for other aircraft that may need assistance—were they assigned to attempt to support multiple flights.

In addition, in reduced-crew or single-pilot operations, instances of pilot

incapacitation or impairment could be "catastrophic" and expose everyone to unnecessary risks. The NASA/FAA 2017 study concludes that entirely new automation and autopilot technologies would need to be introduced to address these and other issues associated with reduced-crew or single-pilot operations—especially taking into account that the national airspace is designed with two pilots and their capabilities in mind.

Having two pilots on the flight deck at all times ensures that two sets of eyes and hands are available to quickly identify, prevent, and correct any errors. Although statistics aren't kept on accidents or incidents averted by pilot action, many recorded incidents of aviation emergencies illustrate situations in which this has been the case. 🌐

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In 2002, Capt. Duane Woerth, then ALPA's president, presents Air Transat pilots Capt. Robert Piché, center, and F/O Dirk De Jager with the Superior Airmanship Award for gliding to a safe landing in the Azores after a massive fuel leak caused a dual flameout over the Atlantic.

In the early morning of Aug. 24, 2001, Air Transat Flight 236, an Airbus A330 flying from Toronto, Ont., to Lisbon, Spain, was flying over the Atlantic Ocean. Nearing Portugal, Capt. Robert Piché and F/O Dirk De Jager observed that engine gauges showed high oil pressure and low oil temperature and that thousands of kilograms of fuel were missing.

The two pilots quickly realized they had to make a nighttime diversion to Lajes Airport on Terceira Island in the Azores; but about 100 miles from the airport, the right engine flamed out. Minutes later, the left engine quit.

With a minimal amount of hydraulic pressure and electrical power supplied by the airplane's ram air turbine, the flight crew worked to fly the airplane on a long glide. During the landing rollout, the A330 blew all eight main gear tires—likely due to the antiskid system being inoperative. The pilots were able to successfully stop the airplane on the runway with few injuries to those on board.

Investigators later determined that a ruptured fuel line in the nacelle caused a large amount of fuel to be pumped overboard.



AVIATION'S SAFEGUARD: TWO PILOTS ALWAYS ON THE FLIGHT DECK

PART 4: THE REGULATORY SAFETY NET

By Christopher Freeze,
Senior Aviation Technical Writer

“While automation continues to greatly aid pilots in terms of aviating and navigating, it should never be seen as a replacement. Pilots are required to control and manage an aircraft and flight in a dynamic and continuously changing environment. They interact with air traffic control; communicate with dispatch; check weather reports and forecasts; visually scan for other aircraft; and monitor multiple aircraft systems, including the aircraft’s engines. Currently, technology can’t adequately replicate or report the sensory information—the sounds, smells, and vibrations—a flight crew depends on to safely operate an air-

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plane in real-world conditions. And this isn’t going to change anytime soon.”
—Capt. Joe DePete, ALPA President

Despite the desire of some to develop and deploy reduced-crew or single-pilot systems in airliners, the current U.S. federal aviation regulations (FARs) governing airline operations are clear: At least two pilots must be present on the flight deck of passenger or cargo transport aircraft. As the conscience of the airline industry, ALPA works to ensure that this formula for air safety success continues through advocacy and the sharing of firsthand perspectives from the flight deck.

The FAA and FARs exist to oversee and govern the safety regulations, standards, and guidance that exist to promote safety—the top priority for aviation and the foundation of the agency’s mission statement. Although single-pilot operations may offer potential economic benefits, they present safety risks that don’t align with the priorities of the FAA or federal regulations.

FARs stipulate the need for a minimum of two pilots on the flight deck. This is expressed throughout the regulations, including those pertaining to the division of responsibilities, aircraft and system design standards, duty limitations, and computer and flight operation monitoring.

In addition, the International Civil Aviation Organization (ICAO), the organization that governs and fosters the planning and development of international air transport to ensure safe and orderly growth, considers safety to be “at

the core of [its] fundamental objectives.” The ICAO Safety Management Manual defines aviation safety as “the state in which the possibility of harm to persons or of property damage is reduced to, and maintained at or below, an acceptable level through a continuing process of hazard identification and safety risk management.” Safety and risk management must be present at every step in the aviation process, from aircraft design to operations to personnel licensing.

FAA regulations show that aircraft design standards currently require the presence of two pilots aboard an airliner, with 14 CFR Part 25 containing aircraft design and airworthiness standards for transport-category aircraft. Part 25 references the need for multiple crewmembers, particularly in Sections 777 and 1357. The language in Part 25.777 denotes the presence of multiple crewmembers, stating, “the controls must be located and arranged, with respect to the pilot seats, so that there is full and unrestricted movement of each control without interference from the flight deck structure...”

In addition, 14 CFR Part 117 prescribes flight and duty limitations and rest requirements for all flightcrew members, assuming multiple pilots are on board to operate the flight, and certificate holders conducting passenger operations. Part 117.17 specifies flight-duty periods for an augmented flight crew, which consists of more crewmembers than the minimum number normally required, allowing crewmembers to rotate. This gives crews the ability to take necessary rest periods during long-haul flights. Single-pilot operations would eliminate the augmented crew and a pilot’s ability to rest during flights—which could potentially lead to incapacitation and flight risks. Reduced-crew operations would similarly compromise the minimum flight crew identified for safe long-haul operations.

Moreover, FAA guidance material highlights the agency’s wariness to support single-pilot operations for Part 121 operations. FAA Advisory Circular 25.1523 offers guidance for complying with the requirements of 14 CFR 25.1523, which pertains to airworthiness certification requirements for a minimum flight crew on transport-category airplanes.

The FAA has instituted a vast regulatory net designed to protect the flying public, pilots, aircraft, and cargo—ranging from ensuring the presence of additional flightcrew members on board airliners to achieving the necessary functionality and safety required of aircraft designs to requiring certification for airline operations. In addition, FAA regulations also reinforce public safety by prohibiting the use of unmanned aircraft systems to transport passengers or cargo for compensation.

The question that must be asked is why would airlines choose to implement

reduced-crew operations that would diminish aviation safety?

Unfortunately, unlike most of the flying public, airline managements don’t measure their air carrier’s success by the metrics of safety, speed, and comfort. Airline managements measure it by just one metric: profit. They see single-pilot and remotely piloted operations as a surefire method to reduce their expenses and inflate their bottom line. But ALPA knows, from more than 90 years of experience, that no airline should compromise safety in the quest for greater profits. 🌐

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From left, F/O Andrew E. Faust (Northwest), S/O William A. Jensen (Northwest), and Capt. Ronald E. Weldon (Northwest) receive Superior Airmanship Awards for their highly professional handling of an in-flight emergency. Both stabilizer brakes on their B-727 failed.

Capt. Ronald E. Weldon, F/O Andrew E. Faust, and S/O William A. Jensen were the flight crew of Northwest Airlines Flight 969 on the morning of Dec. 24, 1994. They took off from Boston’s Logan International Airport in heavy rain and strong, gusty winds bound for Fort Myers, Fla.

During climbout, the crew encountered a serious problem controlling the pitch of the B-727 and determined it involved the stabilizer trim. Following company procedures, the crew tried unsuccessfully to remove all electrical power to the trim motor.

Controlling the aircraft required great physical strength, and the pilots found level flight impossible to maintain. They declared an emergency and cautiously dumped fuel to return to the airport.

Despite an unusual landing configuration, with both pilots flying they successfully landed the airplane without injury or damage.



AVIATION'S SAFEGUARD: TWO PILOTS ALWAYS ON THE FLIGHT DECK

PART 5: AN INTERNATIONAL CALL TO ACTION

By Christopher Freeze, Senior Aviation Technical Writer

“Far too many obstacles must be overcome for single-pilot operations to even be considered a viable concept domestically, let alone on a global scale. While some labor under the misconception that the technology necessary to implement reduced-crew and single-pilot operations is already available, in fact significant advances in automation, communications, and sensor technologies will be required to make the transition without compromising safety. Although some of these technologies are expected to be ready within the next 10 years, others, including high-level artificial intelligence, are decades away from being economically viable.”

—Capt. Joe DePete, ALPA President

The emergence of remotely piloted aircraft technologies is an industry megatrend, and the threat to reduce crew operations has become a global challenge. ALPA continues to advocate for a global approach to oppose any reduction in crew operations.

Most recently, ALPA's position and call to action was heard during the International Federation of Air Line Pilots' Associations (IFALPA) annual conference in Singapore (see page 28). On the first day of the gathering, during the Global Pilots' Symposium (GPS), a panel discussion moderated by Capt. John Sluys (Alaska) was held on single-pilot operations and automation. Representing ALPA was Capt. Bob Fox, the Association's first vice

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president and national safety coordinator. Other panelists included Capt. Juan Carlos Lozano (Iberia), vice president of the European Cockpit Association; Dr. Kirk Vining of Boeing; and Capt. Christopher Cail of Airbus.

“ALPA is sharply focused on preventing the threats posed by single-pilot operations from becoming a reality,” Fox remarked at the conference. “So much so that Capt. Joe DePete, ALPA's president, has created the President's Committee on Reduced Flight Deck Crew Operations to direct our work.”

He asserted, “Manufacturers shouldn't be pushing automation to its limits and beyond in response to airline calls for cutting costs. Instead, manufacturers should be utilizing automation to enhance the two pilots' ability to safely manage flights.

“We've seen advancements in automation, but automation to date has been developed as a tool for pilots, not as a replacement,” Fox continued. Some research has shown that pilots intervene to manage aircraft malfunctions on 20 percent of normal flights. When the researchers extrapolated this data, it suggests that pilots intervene to keep flights safe more than 157,000 times for every time that pilot error contributes to an accident resulting in a hull loss or fatality. While that's one small study, there simply isn't enough research or data in this area, so the number could be much higher.

“The design principles behind automation as a pilot tool must be different from the design principles behind automation as a pilot replacement,” Fox advocated.

“Pilots haven’t been involved in developing or testing such principles because engineers often lack the operational perspective. Line pilots must have the strongest voice.”

In addition, layered automation has had limits in aircraft design and has also challenged the abilities of those charged with safety oversight. And there were fatal consequences when those limits were reached, but recommendations directed to government and industry haven’t yet been enacted.

Fox concluded, “We can’t allow significant changes to be evaluated or undertaken in an environment not yet improved.”

Also attending the conference was Jay Wells, an ALPA senior attorney and IFALPA’s UAS+ Working Group chair, who gave an overview of his group’s recent activities. The working group is composed of ALPA pilots who have expertise in remotely piloted aircraft systems, drones, autonomous and remote civil aircraft technologies, pilotless air carriers and taxis, urban and advanced air mobility, and technologies developed to justify reducing the number of flightcrew members, including remote monitoring or control concepts such as single-pilot operations, reduced-crew operations, and extended minimum crew operations.

Based on the working group’s efforts, in 2020 IFALPA published its position paper “The Dangers of Reduced Crew Operations,” which relied heavily on ALPA’s 2019 white paper discussing the dangers of single-pilot operations. IFALPA’s paper conveyed that reduced-crew and single-pilot airline operations are “a risk not worth taking.”

“IFALPA fully supports any developments that improve the current safety and security standards in commercial air transport,” the paper noted. “Our enviable safety record and culture is based upon at least two properly rested, fully qualified, and well-trained pilots at the controls on the flight deck during all phases of flight. It’s imperative that any future evolution of this benchmark improves upon it and does *not* degrade the safety and security level in any area.

“It’s IFALPA’s position that because reduced-crew operations carry significant

additional risks over existing two-or-more pilot operations, such operations will result in a serious reduction in flight safety and security. It’s essential to fully address the risks and shortfalls in safety and security that lie within those reduced-crew concepts before the industry accepts changes to the standards that have built the safest transportation system in history,” the paper concluded.

Manufacturers have since publicly advanced reduced-crew concepts, and some government regulators have been opening the doors to such efforts. Most notably, IFALPA’s UAS+ Working Group

has been concerned regarding Airbus and the European Union Aviation Safety Agency’s (EASA) apparent rapid movement on reduced-crew operations.

In November 2021, EASA set out to study and assess the risks associated with changes induced by extended minimum crew and single-pilot operations while considering a series of changes to aircraft flight deck configuration identified for transport-category aircraft, including new flight management applications. Nearly a million euros, provided by the European Union’s Horizon Europe research and innovation program, funded the study. 

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From left to right, Capt. Tim Canoll, F/O Michael Oates (Delta), Capt. James Judkins (Delta), and Capt. Mike Donatelli (Delta) at ALPA’s 2015 Air Safety Forum.

Capt. James Judkins and F/O Michael Oates were honored with ALPA’s Superior Airmanship Award for their combined efforts to safely return Delta Air Lines Flight 1990 to Hartsfield-Jackson Atlanta International Airport on Dec. 23, 2014, in poor weather after experiencing significant electrical failures that disabled several flight deck systems.

Oates, a new-hire pilot, was flying the third day of his initial operating experience on the B-717. The airplane was climbing through 8,000 feet when suddenly Oates lost all of his electronic displays. Multiple messages appeared on the engine and alert display, and the crew repeatedly heard loud clicking sounds on the flight deck.

Judkins quickly took the controls of the airplane, instructing Oates to review the reference materials and several checklists to troubleshoot the problem. Judkins soon contacted Atlanta Departure and declared an emergency. With the airplane’s autotrim inoperative, he hand-flew a Category II approach, landing the airplane safely in 2,600 feet of forward visibility.



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AVIATION'S SAFEGUARD: TWO PILOTS ALWAYS ON THE FLIGHT DECK

PART 6: AUTOMATION, TRUST, AND SECURITY: ACCEPT NO SUBSTITUTE

By Christopher Freeze, Senior Aviation Technical Writer

"As the global supply chain crisis has deepened, we've learned more and more about the true costs of delays and weak points in these processes. Any error can produce ripples that impact countless others, both locally and aboard. The same applies to aviation. No one likes delays, passengers and pilots alike, as our industry works diligently to shave minutes and seconds. But to add an unnecessary delay to routine flight deck procedures as would be introduced by the presence of a remote operator—when the standard of two well-trained, qualified, and rested pilots is proven to be best—is simply against the common good and common sense."

—Capt. Joe DePete, ALPA President

Automation technology has advanced significantly over the decades. And while it serves as an important tool pilots employ to keep flying safe, ALPA strongly advocates that technology's role in the commercial airline industry is to supplement safety—not to replace two experienced, well-trained, and well-rested professional pilots on the flight deck. Perhaps the biggest technological hurdle to safe reduced-crew and single-pilot operations is an advanced form of artificial intelligence called artificial general intelligence (AGI). Unlike existing or emerging forms of artificial intelligence that can handle specialized individual tasks, AGI, as envisioned, would effectively replicate human judgment across a broad spectrum of sensing, analytical,

decision-making, and implementation functions.

Such a capability might someday safely replicate the redundancy on the flight deck that a second pilot provides. However, this technology is still a theoretical construct. The recent "FAA Aerospace Forecast" reports that true AGI is at least two decades away. And according to a 2014 NASA paper, short of being able to act, sense, and react like a human pilot, artificial intelligence will have to perform at least two key functions to enable single-pilot operations: interaction and task exchange with the human pilot (captain) and monitoring the health and cognition of the captain.

Interaction includes tasks such as the machine informing the captain what it's doing, confirming important parameters such as altitude settings, and recalling information and instructions provided by air traffic control. Interaction is complicated by the fact that different tasks might be better suited to the captain than the machine—and vice versa—at any given time. The ability to reallocate tasks between the two, especially during off-nominal circumstances, is needed. If the captain becomes overloaded with tasks, they must be able to offload certain tasks to the automation with full confidence. If the machine must offload for similar reasons, it must be able to provide a reason and other situational awareness information ahead of time, which is well beyond the capability of current technology. A well-trained and experienced first officer who is able to see and understand the task saturation the captain may be facing has repeatedly been proven to be a vastly superior alternative.

AUTOMATION OBSTACLES

In addition to whether the level of automation required for single-pilot operations is technologically feasible, concerns remain about relying on such

technology. Increased dependency on automation in aviation may not be advisable, as a key requirement for its implementation is advanced automation that provides onboard support functions at a level well beyond what's currently available in modern airliners. While it may be tempting to simply automate as many of the current pilot functions as possible, distancing the captain from the flight/mission could erode situational awareness and cognitive readiness.

Securing pilot trust is another obstacle. Robotic systems are prone to failures, which can undermine user trust in these systems, eroding their usefulness and benefits. Further factors such as obscured communications and an unequal degree of dependence between the human and the machine also impede trust further. While trust is necessary for humans to take advantage of autonomy, putting trust in unreliable autonomy, particularly in an aviation context, is dangerous.

Furthermore, a lack of trust and perceived safety could inhibit pilot acceptance of automated systems, which presents a barrier to their development.

CYBERSECURITY

Reduced-crew and single-pilot operations also introduce a cybersecurity issue due to the requirement that ground-based pilots be able to assume control of the aircraft in the case of pilot incapacitation or other emergency. Because hostile actors have attacked aircraft radio communications in the past, the possibility of exploiting weaknesses in communications links to disrupt or even commandeer airplanes in flight must be addressed. In order to prevent reduced-crew operations from opening up powerful new avenues of cyberattack on aircraft, countermeasures must be taken. An authentication mechanism to ensure trust of communications is needed to make certain that only authorized personnel or systems on the ground have access to aircraft systems. Similarly, a means for the pilot on the flight deck to deactivate the automation would be necessary—which is at odds with the need for automation and ground pilots to intervene in case of a partially incapacitated pilot. Another baseline capability to address cybersecurity threats would be to encrypt communications between the aircraft and ground, which raises issues of communications redundancy and latency. 🌐

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ON THE EVENING OF

April 13, 2004, United Airlines Flight 854, B-767-300 service from Buenos Aires, Argentina, to Miami, Fla., was in cruise flight at FL310 over the jungles of southern Colombia. Capt. Brian Witcher and F/Os Donald Arlotta and Ross Windom were the flight crew that night.

Suddenly, the autopilot warning horn went off, the flight deck went bright with standby lighting, and the first officer's panel went blank. Witcher took manual control of the airplane and called for a checklist to deal with the electrical failure.

The overhead electrical panel appeared normal, with no lights on except for



Capt. Brian Witcher (center) and F/Os Donald Arlotta (left) and Ross Windom were the pilots of United Flight 854, a B-767 that suffered total electrical failure at night over the jungles and mountains of South America.

the battery discharge light. In fact, the entire overhead panel was normal, with only the automatic speed brake and rudder ratio lights illuminated. The pilots pressed the light-test switch and confirmed that all the lights worked and none of the bulbs were burned out.

Windom arrived from the crew rest area. The three pilots discussed the situation and their options. Shortly afterward, Witcher's instruments began to fail. The pilots immediately declared an emergency and asked air traffic control for a clearance to Bogotá. They tried to establish radio communications with United's dispatch office, both through HF and satellite radios, without success.

The EICAS displays were full of cautions. The pilots soon realized that no checklist existed to cover the situation in which they found themselves. They knew they had a serious electrical problem, but the hydraulic motor generator (HMG) would kick in and keep the captain's instruments powered—according to the manual.

When radios failed,

Witcher reset the generator control circuit breakers. The pilots were surprised when the VHF radio, and Witcher's instruments, came to life again and then promptly failed once more, still about 200 nautical miles from Bogotá.

The pilots squeezed 41 minutes from their 30-minute battery by turning off everything they could, including the outside lights, to conserve battery power for lowering the landing gear. Witcher reset the generator control circuit breaker three times before they landed safely, but with no clearance from the Bogotá tower because their radios still didn't work. The pilots landed with less than two volts of battery power left.

The pilots didn't learn until after the flight that a single bracket grounded both transformer rectifier units in the A/C electrical system. United's Maintenance Department eventually found that corrosion had caused a short circuit of the grounding bracket and that the HMG didn't come on line because it falsely sensed that the airplane had normal A/C power.



AVIATION'S SAFEGUARD: TWO PILOTS ALWAYS ON THE FLIGHT DECK

PART 7: CURRENT AND FUTURE REGULATIONS

By Corey Kuhn, Contributing Writer

“Maintaining today’s level of safety, security, and efficiency is much more important than any dubious benefits of moving a pilot from the flight deck to a remote location. Further, the aviation industry’s collective efforts to focus on higher priorities for the benefit of passengers and shippers shouldn’t be distracted by the establishment of a federal program to evaluate reduced-crew operations at any agency or with any federal dollars.”—Capt. Joe DePete, ALPA President

Improving aviation safety has always been at ALPA’s core. When ALPA’s founders established “Schedule with Safety” as the Association’s motto, they set in motion a forward-thinking approach to aviation safety that continues to be as vital today as it was in 1931. While continued improvements to safety remain at the very top of ALPA’s regulatory and legislative agenda, the Association also keeps a watchful eye on emerging threats that could have significant impact across all aspects of aviation.

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Although current regulations don’t support the development and implementation of single-pilot operations and clearly state that at least two pilots must be present on the flight deck of passenger and cargo transport aircraft, well-funded manufacturers and special-interest groups that stand to profit greatly continue to introduce attempts that, if successful, would enable today’s current regulations to be modified.

One example of such an attempt occurred in 2018 when a “study” was inserted into draft legislation for the reauthorization of the FAA. This was a blatant attempt to modify existing regulations, and ALPA immediately launched a full-scale campaign opposing the legislation. The study had no clear safety mission, no end date, and was a misguided attempt to create a government-funded laboratory for single-pilot operations that ignored the safety of the traveling public.

Through collective efforts by ALPA and other industry stakeholders, Section 744 was ultimately omitted from the bill’s final passage. While these efforts resulted in protecting aviation safety for the time being, ALPA continues to remain vigilant regarding any attempt to undermine the robust regulations in place today.

To support current crew-complement regulations from being adversely modified, ALPA’s Executive Council authorized the creation of the President’s Committee on Reduced Crew Operations (PCRCO) earlier this year. Capt. Russ Sklenka, ALPA’s executive administrator, leads the PCRCO’s efforts.

“For many years, aviation has been the safest form of transportation in the United States. This is by no means an accident,” said Sklenka. “It’s the result of a strong regulatory framework built over time, paired with an ongoing airline safety culture that’s one of the most

THE PILOT-PARTISAN AGENDA

ambitious in our nation's history. The continued desire by some in the industry to pursue single-piloted or autonomously piloted cargo aircraft seriously places the public and flight crews of these aircraft in a tenuous position. Thanks to ALPA's leadership, we're well positioned and will continue to use every resource we have to ensure that these antisafety provisions aren't enacted and that our regulations remain strong."

Through the PCRCO, ALPA tracks industry efforts to modify aircraft and seek approvals for reductions in crew requirements. The committee's work includes opposing petitions for exemption, global

engagement with manufacturers, information sharing, surveying, continuing research, and educating the public on the dangers of reduced-crew operations.

The PCRCO also actively monitors new and emerging technologies, such as unmanned aircraft systems and air mobility aircraft, as they continue to evolve and gain a foothold within the shared airspace. ALPA understands that without the presence of a strong safety advocate, the industry may not heed the numerous lessons learned from the past. Unfortunately, safety isn't always the primary factor in designing and engineering these new aircraft. Many manufacturers today

are technology-based companies with subject-matter experts from the technology industry, not the aerospace industry. As a result, many manufacturers lack meaningful and effective safety management systems.

Keeping a keen eye on the future has been a foundational component to ALPA's efforts and advocacy for more than 90 years. Though these efforts, coupled with safeguarding today's regulations, ALPA remains committed to having two well-trained pilots on the flight deck as they're the critical focal point of aircraft systems safety and integral to the entire commercial aviation system. 🌐

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ON THE NIGHT OF DEC. 11, 2000, Capt. John Vreeken and F/O Elizabeth Hallworth were the flight crew of American Eagle Flight 3215, Saab 340 service from Los Angeles to Monterey, Calif. Only about 30 minutes into the flight, they heard a loud popping noise followed by a sharp thud that resonated through

the airframe. The pilots then realized that the No. 1 engine was running, but not producing thrust.

After quickly assessing the situation, Vreeken shut down the engine by turning off the fuel flow and tried to feather the propeller. Unfortunately, the prop wouldn't feather, and after going through the appropriate checklists, the prop remained in fine pitch, creating a very high asymmetric drag load on the airplane.

Vreeken declared an emergency and asked air traffic control for the distance to the nearest airport. He was advised that they were 15 minutes north of Paso Robles Municipal Airport. The pilots prepared to divert there; they checked the weather and looked at the airport instrument approach plates, as neither pilot was familiar with this off-line airport.

The two pilots also knew that they were flying over hazardous terrain and that maintaining altitude with the No. 1 prop stuck in fine pitch would be extremely difficult. Flying a missed approach at Paso Robles would be virtually impossible. Adding to their



Capt. Duane Woerth, then ALPA president, left, presents ALPA's Superior Airmanship Award to American Eagle Capt. John Vreeken and F/O Elizabeth Hallworth. The pilots landed their Saab 340 after a night nonprecision circling approach to an unfamiliar airport with a windmilling prop they couldn't control.

problem, the sky over Paso Robles was overcast, requiring that they fly an instrument approach.

Unfortunately, the air traffic controller's first attempt to vector the pilots to the VOR DME approach to Paso Robles's Runway 19 put the airline too high to permit them to continue the approach to landing. The pilots decided to switch to the VOR approach from the southeast that would

require them to circle to land. Using superior crew resource management, Vreeken and Hallworth worked together to ensure that the runway lights were turned on, to double-check the surface wind, and to keep the flight attendant and passengers apprised of the situation. As a team, they landed the aircraft safely despite the catastrophic powerplant failure they were forced to contend with.



AVIATION'S SAFEGUARD: TWO PILOTS ALWAYS ON THE FLIGHT DECK

PART 8: ALPA PILOTS SEIZE SAFETY MESSAGING OPPORTUNITIES DURING AIR SAFETY FORUM

By Sharon Bhagwandin, Editor in Chief

"The level of airline safety that the traveling public has come to expect can't be maintained in the future world where new-entrant operations are expected to be a frequent occurrence across our great nation without a strategy to get us there. ALPA stands by as a committed, willing partner as we continue to chart a path on these very important topics into the future."—Capt. Joe DePete, ALPA President

During this year's Air Safety Forum (see page 22), ALPA pilots continued their staunch advocacy for the safety-first approach that's been the foundation of the Association's work for more than 90 years. In two multi-industry stakeholder

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panels, "UAS: Challenges and a Way Forward" and "Space Suites, Drone Zones: Integration Leaders Chart the Shared Path Forward," ALPA members kept a spotlight on maintaining, and building upon, current safety standards: airworthiness certification for aircraft and safety training for the pilot-in-command.

Both expert panel discussions covered an array of challenges faced when integrating new entrants into the airspace, but it was ALPA that advocated for rigorous pilot training, underscoring that pilot training and qualifications are critical to safety and key to why commercial aviation is the safest mode of transportation in the world. History shows that having at least two fully qualified, highly trained, and well-rested pilots on the flight deck is the airline industry's strongest safety asset. And the push for reducing the flight crew—possibly down to even a single pilot or remote pilot—to cut operational costs isn't prioritizing safety and remains unacceptable.

Included in the discussions on current and emerging technologies, ALPA pilots encouraged continued, and increased, cross-collaboration and cooperation among all operators in the national airspace system. With approximately 300,000 certificated remote pilots and 800,000 registered drones today in the United States, ALPA experts were quick to reinforce the critical nature of safety management systems, data collection, and the importance of sharing existing proprietary data to maintain the safety of the national airspace.

Among the ALPA pilots on both industry-wide expert panels were

- Capt. Joe DePete, ALPA's president and a member of the NextGen Advisory Committee and the Advanced Aviation Advisory Committee;
- Capt. Bryan Lesko (United), ALPA's Aircraft Design & Operations Group chair;
- Capt. Vas Patterson (United), ALPA's UAS director; and
- Capt. Steve Jangelis (Delta), a former ALPA Aviation Safety chair and the FAA's

Aviation Safety Information Analysis and Sharing system industry cochair.

As one industry panelist noted, emerging technologies will push current aircraft operations "from 50,000 to millions," reinforcing the critical aspect that as the national airspace expands to welcome new entrants, we must be vigilant not to overload the current air traffic system that's so integral to upholding aviation safety.

Currently, the FAA's certification process for new entrants is rigorous, multilayered, and set to an intentionally measured pace with approvals and growth based on collected safety data through testing. And while a new category of certification, "associated elements," has been added, the FAA is constantly evolving as new communication and tracking systems are studied and monitored.

Adding to the new entrants of the national airspace is a fever-pitch desire for access to airspace for commercial space operations. Today, space launches have become almost commonplace, and as the pace accelerates, safety must be paramount when increasing operators in the shared airspace. As noted by several ALPA pilots, the path to get there includes the continuation of open dialogue among all users of the national airspace system, the sharing of safety data, and cross-industry and advisory agency committee coordination. In addition, discussions about federal agency cooperation, contingency plans, and defined processes for investigating accidents and incidents must be in place to ensure a safe operating environment.

Throughout the Air Safety Forum, ALPA pilots were able to share collected, firsthand information and research that the Association's President's Committee on Reduced Crew Operations has been diligently compiling, including from notable global air shows where manufacturers and their sales teams boast the benefits and conveniences of emerging technologies—all of which revolve around taking airline pilots out of the flight deck. In some cases, the reduction of crew means shifting the pilot-in-command to a remote-area supervisor who's responsible for monitoring up to hundreds of uncrewed aircraft.

ALPA's experts made it clear, however, that relaxing proven safety standards for the world's safest mode of transportation would put the lives of people in the aircraft—and on the ground—at great risk. As new entrants emerge in the national airspace, reducing safety is *not* acceptable. 🌐



Capt. Steve Jangelis (Delta), a former ALPA Aviation Safety chair and FAA Aviation Safety Information Analysis and Sharing system industry cochair, left, moderates a panel on sharing the national airspace.



Capt. Bryan Lesko (United), ALPA's Aircraft Design & Operations Group chair, left, leads a panel discussion on the safe integration of unmanned aircraft systems.

INDUSTRY-EXPERT PANELS

Joining ALPA pilots on Air Safety Forum's "UAS: Challenges and a Way Forward" panel of industry experts were

- Greg Bowles, head of government affairs for Joby Aviation;
- Dallas Brooks, aviation regulatory lead for Wing Aviation LLC;
- Joseph Morra, director of the FAA's UAS Safety & Integration Division; and

● Dr. Parimal Kopardekar, director of NASA's Aeronautics Research Institute.

Participating with ALPA pilots on the "Space Suites, Drone Zones: Integration Leaders Chart the Shared Path Forward" panel were

- Lorne Cass, president of Aero NowGen Solutions LLC and a member of the Advanced Aviation Advisory Committee;
- Karina Drees, president of the Com-

mercial Spaceflight Federation and chair of the Commercial Space Transportation Advisory Committee;

- Capt. Terry McVenes, president and CEO of RTCA, Inc.;
- The Honorable Jennifer Homendy, chair of the NTSB; and
- Capt. Craig Hoskins, vice president of safety, security, and technical affairs for Airbus Americas and a member of the NextGen Advisory Committee.

ALPA PRESIDENT'S COMMITTEE ON REDUCED CREW OPERATIONS UPDATE

During the private days of the Air Safety Forum, Capt. Russ Sklenka, ALPA's executive administrator, who leads the President's Committee on Reduced Crew Operations (PCRCO); PCRCO members; and supporting ALPA staff summarized the committee's regulatory and legislative activities, including past successes and future challenges on both the domestic and international front. The group also reported on current and future advocacy and engagement strategies as well as outlining the PCRCO's agenda for 2023.

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two pilots are required on the flight deck.

On Feb. 20, 2021, Capt. Mark Stephenson (United) and F/O Michael De Vore (United) were operating United Airlines Flight 328, a B-777-222 enroute from Denver International Airport to Honolulu International Airport (see page 30).

Shortly after takeoff, as the aircraft climbed through 10,000 feet, air traffic control called out moderate turbulence at 13,000 feet. The flight crew heard a small pop on the right side of the aircraft followed by a tremendous shudder throughout the aircraft. Seconds later, the crew received an ENG fail light and then a subsequent engine fire warning on the No. 2 engine. Stephenson immediately



disconnected the autopilot and told De Vore to run the engine severe-damage checklist. At this point, the crew recognized that the aircraft was heading straight toward the mountains and became concerned about impending terrain.

Stephenson declared an emergency over the radio and started a left turn. He called MAYDAY, MAYDAY, and air traffic control responded immediately, offering support and whatever help it could provide to get the aircraft back to Denver International.

Capt. Mark Stephenson (United), who along with F/O Michael De Vore (United) was presented ALPA's 2021 Superior Airmanship Award for landing United Airlines Flight 328 after a catastrophic engine failure, thanks his pilot group's Critical Incident Response Program members for their assistance.

ATC offered Runway 7 at the airport, the quickest way to get back on the ground. However, after discussion, Stephenson and De Vore chose to land on Runway 26, ensuring the flight was stabilized and the crew had the time to accomplish all required checklists. After landing safely, the aircraft was met by aircraft rescue and firefighting personnel.



AVIATION'S SAFEGUARD: TWO PILOTS ALWAYS ON THE FLIGHT DECK

PART 9: ALPA LOOKS TO THE FUTURE

By Corey Kuhn, Contributing Writer

"Efforts to reduce flight crew complement aren't going to go away, and ALPA is on the front lines ensuring that policy makers and regulators are properly informed about what is necessary to maintain North America's extraordinary airline safety record."

—Capt. Russ Sklenka, ALPA's Reduced Crew Operations Committee Chair

In each issue this year, *Air Line Pilot* has broken down the various aspects and issues behind continuing attempts to promote reduced-crew, single-pilot, or remotely piloted operations in the airline industry.

To ensure that opposing any attempt to reduce the number of qualified pilots on the flight deck remains a top priority for ALPA into the future, in October the Association's Board of Directors moved to convert and codify the President's

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Committee on Reduced Crew Operations (PCRCO) to a continuing committee. While the PCRCO was renamed the Reduced Crew Operations Committee (RCOC), the committee's mission remains the same.

Under the direction of Capt. Russ Sklenka, the RCOC's chair and the Association's executive administrator, the committee's members work with ALPA's Air Safety Organization, the Collective Bargaining Committee, and other union subject-matter experts to assess the consequences of reducing the human element in airline operations and communicate this information in a meaningful way to the different audiences who need to hear it. Since its inception in May, the PCRCO and its new continuing counterpart have served as a single point of contact within ALPA on all reduced-crew issues, particularly in the urban and advanced air mobility sector.

As the FAA evaluates certification of urban air mobility aircraft, ALPA is filing comments in the *Federal Register* for each type of application so that the regulator and stakeholders are reminded that for safety to remain a priority, the appropriate certification process must be developed as these new-entrant vehicles integrate into the national airspace system.

As this issue of *Air Line Pilot* goes to press, the Association is preparing comments in response to Joby Aviation's JAS4-1 airworthiness criteria. In May 2020, Joby was the first to sign a G-1 certification basis with the FAA. But earlier this year, the FAA announced that urban air mobility aircraft would be certified as a special class of powered-lift aircraft under Part 21.17(b). ALPA knows that these unprecedented decisions could ultimately lead to serious consequences

down the line, which makes the RCOC's work so timely and impactful.

"With our current level of technology, any efforts to reduce minimum flight deck staffing levels pose unnecessary risks to pilots, our passengers and cargo, and the general public. ALPA's mandate has been and will always be that safety is priority one," said Sklenka.

In Washington, D.C., the U.S. Congress is beginning work on the next FAA reauthorization. To ensure that the final legislation doesn't include any attempt to reduce the number of crewmembers on the flight deck, the RCOC is planning a robust public-engagement and education campaign. As evident from efforts in 2018, some special interests will stop at nothing to lay the groundwork to change existing regulations regarding single-pilot operations.

Prior to the last FAA reauthorization, ALPA, through extensive outreach efforts, was successful in removing Section 744 of the FAA Reauthorization Act of 2018, which would have established a research and development program in support of single-piloted cargo aircraft.

To combat any future efforts, the RCOC is also working on developing an updated white paper that will serve as a vital resource for pilots when meeting with legislators, regulators, and industry stakeholders. In the three years since ALPA's most recent white paper on this topic, there's still no compelling evidence showing that reducing the flight crew in airline operations should be pursued. However, significant data shows that having two pilots on the flight deck is still the best safety feature.

RCOC members have spent a great

deal of time ensuring that they have their finger on the pulse of the industry. Through extensive efforts, they continue to gather intel and data on how aircraft manufacturers sell potential options to their customers. Securing and sharing this information is critical to changing the narrative and focusing on how often it takes two pilots to intervene when aircraft emergencies arise.

North American commercial aviation is the safest form of transportation in history, and it's ALPA's mandate to keep this distinction. Addressing the many avenues—legislative, regulatory, contractual, and public engagement—to advance awareness of this issue is critical to maintaining the most vital safety feature on any aircraft: two experienced, well-trained, and well-rested professional pilots on the flight deck. 🌐

SUPERIOR AIRMANSHIP

Day and night, pilots safely transport passengers and cargo to their destinations, routinely performing the expected. They also safely manage the unexpected when situations arise. To honor those flight crews that have experienced unexpected and extraordinary events while piloting their aircraft, ALPA bestows upon them its Superior Airmanship Award.

In each article of this nine-part series, *Air Line Pilot* has highlighted an incident from the past in which flight crews—working as a team—used their knowledge, skills, and abilities to make the difference between a safe landing and the unthinkable alternative. These incidents truly highlight why two pilots are required on the flight deck.

On Dec. 5, 2013, Capt. Edward Bird, F/O Kenneth

Wasson, and F/O Daniel Wright were the flight crew of Delta Air Lines Flight 415, B-767 service from Madrid, Spain, to New York.

At takeoff rotation, the right rear outboard main landing gear tire exploded, blowing a hole through both the bottom and top of the aircraft's right wing and rupturing lines in two of the three aircraft hydraulic systems. The pilots continued the takeoff and subsequently had to prepare to execute an overweight landing with no right engine reverse thrust or nosewheel steering and wheel braking limited to emergency brakes.

The pilots relied on their thorough training and considerable experience to deal with the serious situation aboard their aircraft. They managed their flight deck duties flawlessly by widening the team and perfectly



From left: Capt. Lee Moak, then ALPA president; Delta Air Lines pilot Capt. Edward Bird, F/O Kenneth Wasson, and F/O Daniel Wright; and Capt. Mike Donatelli, then Delta Master Executive Council chair, at ALPA's 60th Air Safety Forum banquet.

coordinating with air traffic control, maintenance, and company dispatch. The pilots executed multiple procedures in a short time in preparation for landing and managed the postlanding evacuation of the

aircraft in a highly professional manner.

As a result, none of the 200 passengers or eight flight attendants were injured, and the damage to the airplane was minimized.