



OUR SAFETY JOURNEY

2023 Chief Aerospace Safety Officer Report

A Message from the Chief Aerospace Safety Officer



Michael P. Delaney

Boeing Chief Aerospace Safety Officer

Progressing in Our Safety Journey

Boeing continues to strengthen its safety practices and culture and bring lasting improvements to aerospace safety. The progress contained in this report is evidence of a collaborative approach with our employees and industry to the safety of our products and services. It's a journey we'll continue to walk each and every day.

What's New

In the past 12 months, we've taken several steps in our journey:



Documented and started using more than 600 additional design practices in Technical Design Reviews.



Established a dedicated ombudsperson for U.S. Federal Aviation Administration (FAA) delegated representatives.



Included a new real-time data and analytics platform into our Safety Management System.



Saw new flight operations representatives providing in-person support to more than 60 airline customers.



Conducted our first joint safety risk management evaluation with a major network carrier to share information and lessons learned for the future.



Conducted workshops with airline heads of training on competency-based training and assessment.



Introduced experiential training called Boeing Virtual Procedures Trainer for pilots.



Held the inaugural Boeing Aviation Safety Conference with industry stakeholders.



Invested in a partnership with Embry-Riddle Aeronautical University to create a research center that will drive safety improvements throughout the industry.



Launched a digital learning platform for employees to discover and contribute safety knowledge.



Our employees submitted twice as many inputs into our Speak Up reporting channel compared to the last year, allowing them to voice concerns and share improvement ideas.

Why It Matters

We value human life above all else, and our teammates take that personally — knowing every decision, every task must be done with transparency and accountability. Safety is about ensuring every person who flies on, uses, operates, designs, builds or services Boeing products gets home safely.



In early 2023 the first Boeing Aviation Safety Conference was held for industry leaders to come together and share insights to improve operational safety.

Strengthening Engineering



Boeing is curating 100-plus years of safety practices, engineering knowledge and lessons learned for current and future generations of engineers.

Boeing continues to build on the foundation of engineering excellence and strengthen its engineering expertise and emphasis on product safety. Following the 2019 realignment of all engineers into a single integrated organization, Boeing began curating 100+ years of safety practices and lessons learned. These design practices capture Boeing's mandates, recommendations, design decisions and rationale for current and future generations of engineers.

This effort includes training engineers on how to use design practices, allowing them to achieve exceptional levels of safety and quality in Boeing products and services. As of early April 2023, more than 1,960 design practices have been documented and released.

These design practices have now been incorporated into Technical Design Reviews to help engineers identify risks and issues earlier in the design process. During these reviews, engineers review engineering work, guided by institutional knowledge such as design practices, lessons learned, and other engineering specifications data and requirements. The company also is developing Design Records, an internal dashboard powered by a search engine tool that will make engineering data and information easier to find and access.

Other resources to strengthen engineering capability include a new Engineering Handbook. The online handbook can help engineers perform a specific engineering task or sharpen their skills in a particular area. It includes everything from onboarding and training to learning about engineering priorities, engineering practices and procedures, templates, professional development resources and engagement opportunities.

Enhancing Oversight Mechanisms



Boeing is enhancing oversight mechanisms, which include the sharing of all safety and potential safety issues with company leaders.

Boeing continues to enhance oversight of its safety processes and procedures. In addition to the Board of Directors [Aerospace Safety Committee](#) (ASC), which assists the Board in the oversight of the safety of company products and services, formal lines of communication ensure all safety and potential safety issues are evaluated, discussed and addressed during weekly Safety Reviews with business unit presidents, Boeing’s chief engineer, functional and program leaders, and members of the FAA.

The Chief Aerospace Safety Office (CASO), which was established in 2021, has developed a comprehensive strategy to strengthen Boeing’s safety practices and culture and is collaborating with global regulators, airline operators and other industry stakeholders to improve the aerospace safety ecosystem.

Boeing also continues to strengthen its Organization Designation Authorization (ODA). Boeing employees selected as representatives of the FAA perform a critical role in aircraft certification and safety assurance, and the company is working to ensure they are able to perform their delegated duties free from any interference.

Boeing is implementing a portfolio of 20 initiatives intended to increase advocacy and support for ODA representatives. For example, the company implemented organizational changes to ensure that leaders with deep regulatory knowledge are in a position to provide advocacy for and support to ODA unit members. The company also implemented enhanced regulator communication training for about 48,000 employees and widely expanded FAA data sharing and transparency. With direction from and in coordination with the FAA, the company is also working to improve ODA oversight, its administration, and to further improve the unit member appointment process and skills development.

Measuring Progress

In May 2022, Boeing commissioned an external company to conduct a survey of the more than 1,000 ODA representatives. Of the 71% of employees who responded to the survey, a significant number have noticed a general improvement in the culture around interference and integrity. Boeing will use these results and conclusions from future surveys to further address specific ODA concerns.

13.9%

Perceived interference

49.4%

Seeing improvement

24.1%

Have concerns about retaliation for reporting concerns

Implementing a Safety Management System



Boeing's SMS Policy describes its commitment to the safety, quality and compliance of its products and services.

Boeing continues to mature its enterprise Safety Management System (SMS), an integrating framework for managing safety risks. Recognized as an industry best practice, airlines around the world have been using an SMS for nearly a decade, gathering data to evaluate systems, make decisions and investigate issues to support the safety of the fleet.

In early 2023, Boeing welcomed the FAA proposal to make an SMS mandatory for all aerospace design and manufacturing organizations. Boeing voluntarily began establishing its SMS in 2019 and its SMS for Commercial Airplanes was formally approved by the FAA in 2020. The company continues to integrate the SMS into its other business units.

Boeing's SMS collects and monitors data from a myriad of internal and external data sources — operational data from the global fleet, employee reporting, audit findings, and design and manufacturing data — to identify and mitigate product safety risks. Acquiring data is the first step of a complex process to risk mitigation. Boeing is also working to ensure the accuracy of conclusions derived from data.

In 2022, the CASO team completed the development of Boeing Safety Intelligence (BSI), a new safety analytics platform that uses advanced modeling techniques and machine learning algorithms to deliver real-time insights. BSI helps teammates proactively monitor emerging safety trends within the global fleet and across the company's SMS, with data reviewed during weekly Safety Review meetings. The company is also working with the FAA Integration and Performance (AIR-740) data analytics team and using machine learning for hazard identification in reports from the fleet. Through BSI and the development of analytics capabilities, Boeing is moving from reactive to predictive hazard identification and mitigation.

Additionally, Boeing is enhancing the SMS governance structure and processes to ensure issues or risks are escalated appropriately all the way up to Boeing's CEO. These enhancements include developing key performance indicators to ensure the SMS is performing as intended.

The inculcation of the SMS includes formal and informal training. In 2022, more than 130,000 employees completed updated SMS training, learning the vital role they play in speaking up about product safety issues and ideas.



Boeing invested in a partnership with Embry-Riddle Aeronautical University to create a research center that will drive safety improvements throughout the industry.

Investing in a Safer Industry

Through the collaborative efforts of its Global Aerospace Safety Initiative, Boeing continues to make progress in developing and implementing comprehensive solutions to advance the safety of the global air transportation system.

The safety of the air transportation system is bigger than any one company, and that is why Boeing continues to share information and work together with airline operators, regulators, academia and other stakeholders to:

Align Safety Management Systems

With an SMS, airlines and manufacturers have the ability to use a common framework and language to produce better safety outcomes. As part of its SMS, Boeing in 2022 conducted more than 30 safety risk management evaluations, including its first joint evaluation with a major network carrier.



A Safety Management System allows airlines, manufacturers and regulators to use a common framework and language to advance safety.

Evolve aircrew and maintenance technician training

Boeing continues to evolve training approaches to go beyond flying and maintenance skills and incorporate other competencies such as teamwork, communications and resource management. In 2022, the company delivered competency-based training and assessment (CBTA) courses to four commercial customers. Boeing also conducted workshops with airline heads of training on these programs that included more than 60 customers and more than 20 regulators. Additionally, CBTA courses for the Next-Generation 737, 737 MAX and 787 were approved by multiple regulatory agencies. The company also introduced the Boeing Virtual Procedures Trainer and Maintenance Synthetic Trainer for pilots and mechanics, providing experiential training and complementing current training programs.



Competency-based training augments current training with leadership and judgment skills that enhance the ability to make sound decisions.

Provide enhanced support to customer aircrews and maintainers

New flight operations representatives act as on-site advisers, consultants and partners to airlines' flight operations, training and safety programs, providing guidance on how to best safely and effectively operate their Boeing airplanes. These highly experienced professionals with an average of 13,000 to 15,000 hours of airline experience have engaged more than 60 airlines in 2022.



Hayden Tunmer is a member of the Flight Operations Representative team. Co-located with Boeing customer airlines, Tunmer serves as an on-site adviser, consultant and partner to airlines' flight operations, training and safety programs.

Ensure fleet performance data is fed back into Boeing design processes

In 2022, Boeing launched an initiative to synthesize operational data and inform engineering and design. The effort is intended to assure airplane designs operate as envisioned once they are in the field. Boeing teams have completed data analysis of four pathfinder projects and have shared the operational data with engineering teams.



Boeing has taken steps to ensure that data on the operations of its airplanes is provided back to engineering teams, to assure designs are working as envisioned.

Provide more opportunities for collective problem-solving:

In February 2023, the company hosted the first-ever Boeing Aviation Safety Conference. More than 200 representatives from more than 90 carriers attended this inaugural event. The conference, which will be conducted annually, brings together safety, training and operations representatives of airlines and regulators and is intended to enhance aviation safety across the industry through the sharing of knowledge, best practices and lessons learned.



(From left) Dan Freeman, vice president of SMS; Mike Delaney, Chief Aerospace Safety Officer; and David Joyce, board director and chair of ASC, discuss safety governance during the Boeing Aerospace Safety Conference.

Partner with academia on safety

In 2022, the company partnered with Embry-Riddle Aeronautical University to advance aviation safety. In early 2023, Boeing donated \$5.1 million for a research center that will drive safety improvements throughout the industry. The center, which is expected to open in the fall of 2023, will conduct research to mitigate known and emerging operational safety risks to advance the safety of all who fly.



Howard McKenzie (left), Boeing Chief Engineer and Executive Vice President of Engineering, Test & Technology, signs an artist's rendering of the forthcoming Boeing Center for Aviation and Aerospace Safety at Embry-Riddle. Looking on is Embry-Riddle President... (missing name)

Fostering Transparency and Openness

Pivotal to strengthening product safety is the transition to a more open and transparent culture where all employees feel comfortable speaking up and learning from mistakes and successes. A [positive safety](#) culture enables proactive identification and mitigation of risks to prevent accidents, injuries or loss of life.

Evidence of the company's shifting culture is the increasing number of Boeing teammates who have voiced concerns and shared improvement ideas using the Speak Up confidential reporting channel. Since its inception in 2019, Speak Up has helped to resolve issues and share learnings across the enterprise. Compared to the previous year, employees in 2022 submitted twice as many inputs into Speak Up.

In addition to Speak Up, Boeing established a confidential channel for ODA representatives to voice concerns. In June 2022, the company appointed a dedicated ODA ombudsperson to further foster an environment where ODA representatives carry out their duties independently and without interference. Mark Fava, an experienced aviation lawyer with more than 35 years of aviation experience, serves as a neutral, independent third party to advise and assist ODA representatives with any concerns, including those related to independence and transparency. He is guided by the core values of the International Ombuds Association Code of Ethics.

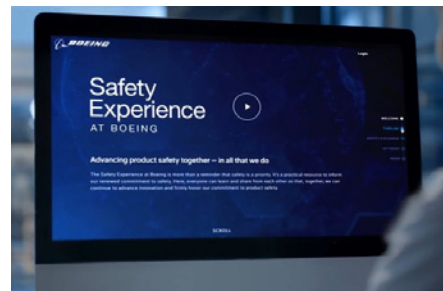
A major initiative to further promote transparency and a culture of learning is the Safety Experience at Boeing, which the company developed for its teammates in early 2023. The Safety Experience is a digital learning platform that provides employees with an engaging and collaborative forum for discovering and sharing product safety information. The digital platform complements the Safety Promotion Center in Everett, Washington, where employees can visit to learn and reflect on Boeing's safety culture and lessons from the past. The exhibits in the center will undergo a major upgrade in 2023.



A positive safety culture promotes an open and transparent environment.



Boeing ODA Ombudsperson
Mark Fava



The Safety Experience at Boeing promotes a culture of learning and transparency.

Coming Soon

THE SAFETY EXPERIENCE AT BOEING

An immersive digital platform that promotes a culture of learning and transparency.
Launched within Boeing in 2023. Launching globally in 2024.