



Enhancing Safety Culture in Transportation: *Lessons Learned from Aviation*

Key Federal Aviation Administration Safety Programs | April 2016

The U.S. commercial aviation industry is a world leader and model for risk mitigation. By working together, the aviation industry and federal government reduced the fatality risk in U.S. commercial air travel by 83 percent between 1998 and 2008. The industry and government now share a goal to reduce the U.S. commercial fatality risk by 50 percent from 2010 to 2025.

Safety Management Systems (SMS)

Safety Management Systems is the formal, top-down, organization-wide approach to managing safety risk and ensuring the effectiveness of safety risk controls. SMS establishes a set of business processes and management tools to examine data gathered from everyday airline operations, isolate trends that may be precursors to incidents or accidents, take steps to mitigate the risks, and verify the effectiveness of the program. SMS requires compliance with technical standards but also promotes a safety culture to improve the overall performance of the organization. It uses four key components—safety policy, safety risk management, safety assurance and safety promotion.

The FAA issued a final rule in January 2015 that requires most U.S. commercial airlines to have Safety Management Systems in place by 2018. The rule builds on the programs many airlines already use to identify and reduce aviation risk. It requires airlines to implement a SMS within three years. They must submit their implementation plans to the FAA within six months. The rule also required a single accountable executive to oversee SMS. An SMS defines “what” is expected rather than “how” the requirement is to be met. This allows each air carrier to design an SMS to match the size, complexity and business model of its organization. An SMS does not take the place of regular FAA oversight, inspection and audits to ensure compliance with regulations.

Compliance Philosophy

Last year, the FAA developed the new Compliance Philosophy to enhance the FAA’s ability to find safety problems before they result in an incident or accident, use the best tools to fix those problems, and then monitor the situation to ensure that no new problems develop. This approach recognizes that most operators comply with the rules and voluntarily use SMS to identify hazards. They then assess the risks from those hazards, and put measures in place to mitigate the risks.

The Compliance Philosophy challenges the status quo. The FAA wants safe operators, not operators who inadvertently make a mistake and then hide it because they are afraid they will be punished. Based on cooperation and trust, it encourages an open and transparent exchange of information and data between the FAA and industry. The Commercial Aviation Safety Team (CAST) used this approach to reduce the fatality risk in U.S. commercial aviation by 83 percent over 10 years.

The FAA’s Compliance Philosophy helps the FAA and industry use critical thinking to work smarter and more efficiently to get to the bottom of potential safety problems. It’s about finding a problem, fixing it, and making sure it stays fixed.

The FAA will continue to have zero tolerance for intentional reckless behavior, inappropriate risk-taking, repeat failures, falsification, failure to fulfill commitments, or deviation from regulatory standards. The FAA vigorously pursues enforcement action in these circumstances.



Federal Aviation Administration



Voluntary Reporting Programs

Aviation safety today is about looking ahead. The aviation community has moved away from the “forensic” approach of making safety improvements based solely on accident investigations to a proactive strategy that incorporates a mix of actual flight data, data from other government agencies, and voluntarily submitted information from airline employees. Voluntary reporting programs have significantly contributed to the nation’s impressive commercial aviation safety record, including improvements to training, as well as enhanced operational and maintenance procedures.

Commercial Aviation Safety Team (CAST)

The nation’s impressive commercial aviation safety record is due in part to the aviation industry and government voluntarily investing in the right safety enhancements to reduce the fatality risk in commercial air travel in the United States. The work of the CAST, along with new aircraft, regulations, and other activities, reduced the fatality risk for commercial aviation in the United States by 83 percent from 1998 to 2008.

CAST has evolved, and the group is moving beyond the “historic” approach of examining past accident data to a proactive approach that focuses on detecting risk and implementing mitigation strategies before accidents or serious incidents occur. The goal over the next decade is to transition to prognostic safety analysis. CAST aims to reduce the U.S. commercial fatality risk by 50 percent from 2010 to 2025.

The increasing number of operations requires greater emphasis on acquiring, sharing, and analyzing aviation safety information. Using incident data, CAST is examining emerging and changing risks to identify prevention strategies.

Because there are few commercial aviation accidents and no common causes, more data points are needed. Voluntary programs such as the Aviation Safety Action Program (ASAP), Flight Operational Quality Assurance program (FOQA), and Air Traffic Safety Action Program (ATSAP) give air carriers and the government insight into millions of operations so potential systemic safety issues and trends are identified.

Aviation Safety Information Analysis and Sharing Program (ASIAS)

The ASIAS program connects approximately 185 data and information sources across government and industry, including voluntarily provided safety data. The ASIAS program works closely with the Commercial Aviation Safety Team and the General Aviation Joint Steering Committee (GAJSC) to monitor known risk, evaluate the effectiveness of deployed mitigations, and detect emerging risk.

There are currently 45 Part 121 member air carriers, 20 corporate/business operators, two manufacturers, and two maintenance, repair and overhaul organizations participating in ASIAS. The program continues to evolve but has matured to the point that the FAA and industry can leverage voluntarily provided safety data from operators that represent 99 percent of U.S. air carrier commercial operations.

ASIAS partners with CAST to monitor the effectiveness of deployed safety enhancements. ASIAS has established metrics that enables CAST to evaluate the effectiveness of the mitigations. ASIAS also supports the GAJSC by using de-identified general aviation operations data to help identify risks and evaluate the effectiveness of deployed solutions. The GAJSC is reaching out to the general aviation community through stakeholders to demonstrate the benefits of sharing safety data with ASIAS in a protected, non-punitive manner. ASIAS partners with the industry-sponsored Aviation Safety InfoShare meeting, which facilitates the sharing of safety issues and best practices in a protected environment. This partnership enables ASIAS to provide a data-driven approach to early identification of emerging systemic safety issues within the National Airspace System.