FLIGHT SAFETY FOUNDATION

Insights from Flight Safety Foundation's 2024 Forums:

# Strengthening Safety Culture and Managing Emerging Risks

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## Introduction

Flight Safety Foundation held a series of summits and forums across the globe in 2024, each aiming to address the challenges and opportunities shaping the future of aviation safety. These events convened a diverse array of stakeholders — regulators, operators, industry leaders, manufacturers, and safety experts — to discuss and strategize on improving safety standards and practices. Over 1,000 industry professionals, panelists, and speakers from more than 70 countries participated. By creating a global platform for collaboration, the Foundation is advancing aviation safety and addressing diverse issues from operational resilience to climate adaptation. The following sections synthesize key themes, integrating insights from regional events, global collaboration efforts, Foundation thought leadership, and targeted discussions.

## 1 Operational Resilience and Safety Culture

The Foundation's 2023 Safety Report highlighted the critical role of safety culture in maintaining aviation's stellar safety record. Even with reduced accident numbers, near-collisions demonstrated the dangers of complacency. Safety leadership's commitment to promoting a safety-first attitude, strict protocol adherence, and transparent communication was emphasized as the foundation of a resilient safety culture.

Operational resilience and the cultivation of safety cultures were central to the Foundation's agenda in 2024, reflecting the aviation industry's need to adapt to increasing complexity and uncertainty.

## 1.1 Building Resilience

Operational resilience was discussed extensively at the Business Aviation Safety Summit (BASS), where stakeholders emphasized the importance of proactive risk management. This included integrating safety management systems (SMS) into all levels of operations, even for smaller operators. Examples included creating user-friendly SMS platforms and encouraging emotional buy-in through education and leadership advocacy. A "just culture" philosophy, where errors are treated as opportunities for learning rather than grounds for blame, was stressed.

## 1.2 Safety Leadership

Safety leadership is a cornerstone for developing resilient organizations. The Asia Pacific Summit for Aviation Safety (AP-SAS) in Beijing highlighted how leaders can strengthen safety culture by modeling accountability, fostering open communication, and setting safety as an organizational priority. During BASS, operators presented methods of tabletop emergency exercises that encourage leaders to participate in after-action reviews and to improve decision-making and crisis management capabilities. While different regions of the world may have different social norms and cultures, the AP-CAS participants agreed that the fundamentals of a positive safety culture — open reporting and being fair and non-judgmental — remain universally the same and entail collaboration between management and the workforce.

## 1.3 Crisis Management

Emergency response preparedness was another focal point during Foundation events, with BASS sessions detailing how organizations should integrate emergency response planning with SMS. The African Aviation Safety and Operations Summit in Addis Ababa, Ethiopia, demonstrated the value of regional collaboration in addressing runway excursions, which were cited as one of Africa's high-risk categories. Effective solutions included operationalizing runway safety teams and setting measurable key performance indicators (KPIs) in order to reduce excursions.


## 2 Human Factors, Mental Health, and Well-Being

The aviation industry's most valuable asset is its people, making the management of human factors and mental health a critical component of safety. In 2024, Foundation events highlighted how addressing the needs of the workforce directly contributes to improved safety outcomes, emphasizing the integration of mental health, fatigue management, and workforce development into broader safety frameworks. To underscore the importance of this topic in aviation, the Foundation published *Path to Wellness: Charting a New Course for Mental Health in Aviation*, a comprehensive blueprint and a call to action to address the priorities and gaps in this area.

## 2.1 Addressing Mental Health

All of the Foundation's 2024 events placed mental health at the forefront, tackling issues such as stigma and inadequate support systems. For example, U.S. Federal Aviation Administration Federal Air Surgeon Dr. Susan Northrup's keynote at the International Aviation Safety Summit (IASS) in Rio de Janeiro highlighted the complexities of managing mental health among aviation

professionals, emphasizing the integration of mental health considerations into SMS. Examples of successful interventions included peer support networks, confidential reporting mechanisms, and training to destigmatize mental health discussions.

## 2.2 Workforce Development

The African Aviation Safety and Operations Summit spotlighted the challenges of workforce shortages, emphasizing training programs, mentorship initiatives, and partnerships with academic institutions. Gender inclusivity was also prioritized, with strategies to retain female pilots through policy adjustments involving uniforms and hairstyles to accommodate cultural and personal preferences.

## 2.3 Fatigue Risk Management

Fatigue risk management was a critical area discussed at BASS and the African Safety and Operations Summit. Solutions included leveraging tools like biomathematical models to analyze duty schedules and promote adequate rest periods. Collaboration between employees and organizations, with operators providing rest opportunities and employees ensuring fitness for duty, was cited as essential.

# 3 Technological Innovation

Technological advancements are transforming the aviation industry, offering powerful tools to enhance safety, efficiency, and decision-making. However, with these opportunities come challenges in implementation, training, and regulatory adaptation. In 2024, several Foundation events showcased the role of innovation in addressing long-standing safety concerns, such as turbulence, runway incursions, and operational efficiency, while also exploring the complexities of integrating new systems into traditional aviation environments.




From turbulence-detection systems to advanced cockpit technologies, these innovations represent a leap forward in safety capabilities. Yet their successful adoption requires a balance between embracing new tools and maintaining the foundational practices that underpin safety culture. This section delves into the technologies shaping aviation safety and examines how the industry is navigating the opportunities and obstacles associated with their integration.

## 3.1 Advanced Tools and Systems

Technological advancements like augmented reality tools for cockpit smoke masks and turbulence detection systems were highlighted for their ability to enhance safety. The Safety Forum in Brussels demonstrated how real-time weather information, such as that provided by advanced radars and electronic flight bags, could improve situational awareness. Honeywell's Guided Visual Flight Procedures and turbulence-monitoring technologies like SkyPath illustrated how data-driven innovations reduce risks.

## 3.2 Data-Driven Safety

The importance of data-driven safety was emphasized as a cornerstone for modern aviation safety, highlighting how real-time data sharing, advanced analytics, and predictive tools enable stakeholders to identify trends, anticipate risks, and implement targeted, effective safety measures. For example, the importance of utilizing data effectively was emphasized, with programs like flight operational quality assurance (FOQA) and regional safety data-sharing initiatives being lauded. The Foundation's African summit discussed the need for collaborative safety enhancement groups to foster data sharing, allowing regions to tackle challenges like runway safety through a unified approach. At IASS, safety information sharing programs such


as Europe's Data4Safety (D4S), Aviation Safety Information Analysis and Sharing (ASIAS) in the United States, and the Brazilian Commercial Aviation Safety Team (BCAST) highlighted the power of analyzing vast amounts of safety and operational information and identifying leading indicators and emerging risks.

### 3.3 Implementation Challenges

Despite these advances, integrating new technologies presented challenges. Discussions emphasized the importance of regulatory adaptation, comprehensive training, and addressing the economic disparities between regions to ensure equitable access to technology.

## 4 Climate and Environmental Challenges

The aviation industry operates in an environment increasingly shaped by the realities of climate change and extreme weather. These factors are introducing new risks while also challenging traditional approaches to safety and operational resilience. At Foundation events in 2024, climate-related challenges emerged as a key theme, with discussions focusing on proactive measures to address weather-related risks and integrate sustainability into safety frameworks.

From turbulence exacerbated by climate change to the operational impacts of extreme heat and flooding, the industry is grappling with how to adapt to these evolving conditions. At the same time, sustainability goals are driving innovation, requiring aviation to balance environmental objectives with safety imperatives. The Foundation believes that both are achievable, and that innovation is the bridge between safety and sustainability. This section explores the intersection of climate challenges and safety, highlighting the insights and strategies shared during the Foundation's global events.

### 4.1 Weather Resilience

The Safety Forum's focus on aviation weather resilience underscored the need for proactive measures to address weather-related risks. Recommendations included investing in advanced forecasting technologies, harmonizing global meteorological data, and enhancing pilot training

for adverse weather scenarios. For example, Forum participants from Africa highlighted the need for better infrastructure to withstand climate-related pressures, such as extreme heat and flooding.

### 4.2 Sustainability and Safety

Sustainability goals were integrated with safety initiatives, particularly in discussions on advanced air mobility (AAM). Balancing environmental objectives with safety imperatives requires innovative approaches, such as designing resilient infrastructure and integrating climate considerations into operational planning.

## 5 Global Collaboration and Regional Insights

In an industry as interconnected as aviation, global collaboration is not merely beneficial — it is essential. Shared safety challenges transcend geographical boundaries, necessitating cooperation among stakeholders to achieve meaningful progress. The Foundation's 2024 events emphasized the power of collective action in addressing both longstanding safety concerns and emerging risks.

Foundation events demonstrated how pooling resources, expertise, and data can amplify the impact of safety initiatives. From regional summits addressing localized challenges to global forums advocating harmonized safety standards, these collaborations exemplified the critical importance of working together to strengthen the global aviation safety framework.

### 5.1 Regional Collaboration

The African summit emphasized collective action to enhance regional oversight capabilities and promote standardized safety practices. Collaborative safety enhancement groups were proposed to bridge gaps between stakeholders, ensuring that competition did not hinder safety progress.

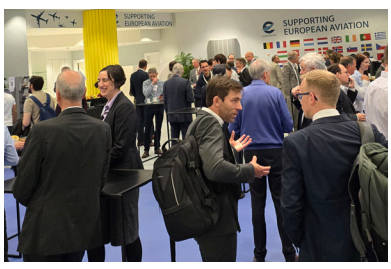
### 5.2 Global Knowledge-Sharing

Events like IASS facilitated the exchange of best practices across regions, with initiatives like the European Union Aviation Safety Agency's D4S and FAA's ASIAS programs serving as models for global data-sharing efforts. By fostering such collaboration, the Foundation reinforced the importance of unified action to tackle global safety challenges.

## 6 Balancing Innovation and Tradition

The aviation industry stands at a crossroads, where rapid technological advancements and operational shifts are reshaping the safety landscape. However, with change comes the responsibility to ensure that innovation is integrated thoughtfully and without compromising established safety principles.

In 2024, Foundation events emphasized the importance of structured change management when introducing new technologies, systems, and processes. Advanced tools such as augmented reality cockpit systems, turbulence detection technologies, and enhanced runway safety systems offer


the potential to significantly reduce risks. Yet these innovations must be carefully implemented alongside well-established practices to avoid creating unintended vulnerabilities.

By balancing innovation with tradition, the industry can maintain its commitment to safety while embracing opportunities for growth and efficiency. This delicate equilibrium ensures that progress strengthens aviation safety and continues to inspire confidence across the global aviation community.

## 7 Adapting Safely

Adapting to the ever-evolving landscape of aviation is a critical challenge that requires careful consideration of safety at every step. The Foundation's 2024 events emphasized that adapting safely involves not only embracing innovation but also ensuring that changes are integrated seamlessly into existing systems to enhance, rather than compromise, safety.

### 7.1 Balancing Innovation with Operational Realities

As new technologies, processes, and frameworks are introduced, there is a need for structured change management to minimize disruptions. For instance, discussions at the 2024 Safety Forum highlighted the integration of advanced weather radar systems, which provide better detection of turbulence and adverse weather conditions. While these systems hold great promise, their success depends on comprehensive training for flight crews and air traffic controllers, ensuring these tools are used effectively during real-world operations.

Similarly, the African Safety and Operations Summit addressed the challenge of integrating automated systems in resource-limited environments, underscoring the importance of tailoring solutions to fit regional operational contexts while maintaining global safety standards.

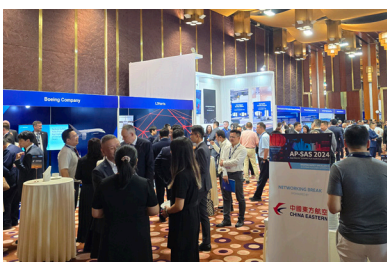
### 7.2 Leadership and Safety Culture

Adapting safely also requires strong leadership and a robust safety culture. Leaders must not only champion change but also create environments where employees feel empowered to voice concerns, report hazards, and contribute to solutions. This was a recurring theme at BASS, where fostering trust and collaboration across all levels of an organization was identified as essential for adapting to new safety requirements and technological advancements.

### 7.3 Proactive Risk Management

Effective adaptation hinges on identifying and mitigating risks before they escalate. Data-driven SMSs, such as those discussed at IASS 2024, provide aviation stakeholders with tools to analyze trends, predict risks, and implement proactive measures. These systems help bridge the gap between innovation and established safety practices by ensuring that data insights inform every decision.

### 7.4 Training and Workforce Development




As changes are implemented, training becomes a critical component of safe adaptation. The emphasis on competency-based training and continuous skill development ensures that aviation professionals are equipped to handle both traditional safety challenges and challenges posed by new technologies. For example, the introduction of advanced turbulence detection tools requires updated training modules that account for both operational use and situational awareness

## 8 Conclusion and Moving Forward

As the aviation industry continues to evolve, the Foundation remains steadfast in its commitment to fostering global collaboration and innovation to address emerging and persistent safety challenges. The events and discussions of 2024 underscored the critical importance of maintaining a strong safety culture, mitigating risks associated with runway incursions and turbulence, and enhancing operational resilience through proactive risk management and leadership commitment.

In the coming year, the Foundation will focus on the following priorities:

### Strengthening Safety Culture

- Promote leadership accountability and transparent communication to ensure safety remains a core value across all organizations.
- Support the integration of mental health and human factors into SMS to enhance workforce well-being and performance.

### Advancing Collaborative Risk Mitigation

- Facilitate global partnerships to address high-risk areas like runway incursions and excursions, building on the recommendations of initiatives such as the Global Action Plan for the Prevention of Runway Incursions and the Global Action Plan for the Prevention of Runway Excursions.

- Champion data-sharing programs like D4S and CAST/ASIAS to foster informed decision-making and predictive risk management.

## Innovating for Safety

- Support the adoption of advanced technologies, such as turbulence detection systems and runway safety tools, to proactively address operational risks.
- Encourage investment in sustainable aviation practices that balance environmental objectives with safety imperatives.

## Enhancing Global Safety Standards

- Advocate for the harmonization of safety regulations and oversight across regions to create a unified and resilient global aviation safety framework.
- Provide guidance and best practices for managing workforce shortages and maintaining safety standards amid industry growth.

## Strengthening Preparedness for Emerging Challenges

- Address the risks posed by increasing air traffic, AAM, and climate-related disruptions through research, education, and the development of practical solutions.
- Expand capacity-building initiatives to empower local stakeholders and emerging markets to meet global safety standards.

The Foundation's work in 2025 and beyond will be driven by a commitment to action, collaboration, and continuous learning. By building on the successes of its events and reports, the Foundation aims to lead the aviation industry toward a safer, more resilient future, ensuring that safety remains at the heart of all aviation endeavors.