

The Intersection of Aviation and Insurance: **Managing Risks in a Dynamic Industry**

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Executive Summary

This white paper explores the risk management approaches in the aviation industry and the insurance underwriting sector, highlighting their similarities, differences, and key concerns. The objective is to identify potential areas for collaboration to enhance safety and risk management practices. This paper draws on insights from a workshop organized by Flight Safety Foundation and Gallagher Aerospace that brought together aviation insurance underwriters, brokers, and airlines to discuss safety management systems (SMS) and risk management methodologies.

The Global Aviation Underwriting Industry

Market Size and Scope

The global aviation insurance market is a substantial and vital component of the broader insurance industry and is valued at approximately \$6 billion annually. The aviation insurance market encompasses various insurance products, including hull insurance, liability insurance, and war risk insurance, catering to a diverse range of aviation sectors, including commercial airlines, private jets, helicopters, airports, and aerospace manufacturers.

Market Segmentation:

- **Commercial aviation:** This segment covers airlines and charter services.
- **General aviation:** Includes private aircraft, flight schools, small operators, advanced air mobility, and large military fleets, which are included here because they do not belong to either the airline sector or the aerospace sector.
- **Aerospace sector:** Manufacturers, airports, ground services, maintenance, repair and overhaul organizations, air navigation service providers, and other companies providing services to the aviation industry;
- **Space:** Covers risks related to space and space launches.

Risk Management and Underwriting Practices

Aviation underwriting involves assessing a wide array of risks, from aircraft hull damage and liability claims to operational disruptions and geopolitical threats. Key factors influencing underwriting decisions include those applicable to the class as a whole, such as the type and age of aircraft; factors specific to the operator, such as claims, pilot experience, maintenance practices, and the operational environment; and insurance market factors, such as availability of capital, cost of reinsurance, and competition.

Risk Management Tools:

- **Predictive analytics:** Utilized to forecast potential losses and assess risk exposure based on historical data and trends.
- **Safety audits:** Regular inspections and audits to ensure compliance with safety standards and regulations.
- **Data integration:** Leveraging comprehensive data from various sources to enhance risk assessment accuracy.

Emerging Trends and Challenges

The aviation underwriting industry faces several emerging trends and challenges, such as:

- **Increased liability claims:** Higher passenger numbers, legislative changes, and larger aircraft increase the potential for significant liability claims, with awards per passenger often reaching millions of dollars.
- **Pilot shortage:** A growing demand for pilots, coupled with a tightening labor supply, presents risks related to pilot experience and training quality.
- **Technological advancements:** The integration of new technologies, such as artificial intelligence (AI) and advanced automation systems, requires underwriters to continually update their risk models and assessment techniques.
- **Climate change:** Increasing turbulence and extreme weather events due to climate change pose additional risks to flight operations, impacting underwriting decisions and premium calculations.
- **Higher repair costs** due to inflationary pressure and also because of the increased cost of repairs associated with composite materials, new avionics equipment, etc.
- **Environmental, social, and governance concerns** extend beyond increased traffic, supply chain challenges, and airport capacity.

Regional Market Insights

- **North America:** The largest market, driven by a high number of commercial and private aircraft operations.
- **Europe:** Significant marketshare due to major aerospace manufacturers and busy international airports.
- **Asia-Pacific:** Rapid growth fueled by increasing air travel demand and expanding commercial fleets.
- **Latin America, Middle East and Africa:** Each with its own challenges, these markets have also experienced increased travel demand and capacity constraints due to shortage of aircraft.

Approaches to Risk Management

Aviation Industry

Risk management is a critical aspect of both the aviation industry and the insurance underwriting sector. Effective risk management ensures the safety and reliability of aviation operations while providing financial stability and protection against unforeseen events. Understanding how these two industries approach risk management can foster better collaboration and enhance overall safety and efficiency.

The aviation industry prioritizes safety through comprehensive safety management systems (SMS). These systems are designed to identify, assess, and mitigate risks associated with aviation operations. Key components of SMS include:

- **Safety culture:** Emphasizing the importance of a proactive safety culture at all organizational levels.
- **Risk assessment and mitigation:** Identifying potential hazards and implementing strategies to mitigate them.
- **Data and information sharing:** Utilizing safety data to identify trends and improve safety measures.
- **Regulatory compliance:** Adhering to international and national safety standards and regulations.
- **Continuous improvement:** Regularly evaluating and improving safety practices.

Insurance Underwriting

Insurance underwriters assess and manage risks to provide financial protection against potential losses. Their approach to risk management includes:

- **Risk assessment:** Evaluating the likelihood and potential impact of various risks.
- **Data analysis:** Using historical data and predictive models to assess risk exposure.
- **Premium setting:** Determining insurance premiums based on assessed risks.
- **Risk mitigation:** Encouraging insured parties to implement safety measures to reduce risk.
- **Claims management:** Handling claims efficiently and fairly to maintain trust and financial stability.

Challenges in Insurance Underwriting

Inconsistent Safety Information

One of the primary challenges for insurance underwriters is the inconsistency in safety information provided by airlines. The lack of standardized reporting formats can lead to difficulties in accurately assessing their clients' risk profiles.

Communication Barriers

Effective communication between airlines and underwriters is essential for accurate risk assessment and management, and for obtaining the best results for both parties. However, there can be communication barriers due to technical jargon, differing priorities, and a lack of mutual understanding of each other's operational challenges. Bridging these communication gaps is crucial for effective collaboration and risk mitigation.

Data Availability and Quality

Underwriters rely heavily on data to assess risks and set premiums. However, the availability and quality of safety and operational data from airlines can vary significantly. Incomplete or low-quality data can hinder underwriters' ability to accurately assess risks and may lead to less favorable terms for the insured parties.

Emerging and Evolving Risks

The aviation industry is continually evolving, with new technologies and operational practices introducing new risks. Underwriters may struggle to keep up with these emerging risks, such as cybersecurity threats, AI integration, and changes in environmental regulations. Staying ahead of these evolving risks requires continuous learning and adaptation.

Attritional Losses

While catastrophic risks in aviation are relatively low, attritional losses (frequent, smaller-scale incidents) are a significant concern for underwriters. Managing and mitigating these losses requires detailed analysis and targeted strategies, which can be resource intensive. The cumulative impact of these losses can affect the profitability of underwriting aviation risks. As an example, the International Air Transport Association estimates that the annual cost of ground damage could double to nearly \$10 billion by 2035 unless preventive action is taken.

Safety Culture and Leadership Assessment

Evaluating the safety culture and leadership within aviation organizations is challenging for underwriters. A strong safety culture can significantly reduce risks, but assessing this intangible asset requires in-depth understanding of the culture and qualitative assessment methods, which may not always be readily available or standardized.

Regulatory and Compliance Variations

The aviation industry operates under stringent regulatory frameworks that vary by region and country. Underwriters must navigate these variations and understand local regulations to accurately assess risks and ensure compliance. This complexity adds to the challenge of underwriting aviation risks.

Financial Impact of Safety Initiatives

Airline safety personnel often need to justify the financial impact of safety initiatives to their management. Underwriters may struggle to quantify the financial benefits of improved safety measures, making it challenging for airlines to secure the necessary investments. Demonstrating the return on investment for safety initiatives is crucial for gaining management support.

Risk Mitigation Implementation

Underwriters can provide recommendations for risk mitigation, but the implementation of these measures depends on the airline's commitment and resources. Ensuring that airlines follow through with recommended safety practices and invest in necessary improvements can be a significant challenge.

Similarities in Approaches Between the Two Industries

Both industries share a focus on identifying and mitigating risks to ensure safety and financial stability. They rely heavily on data analysis and continuous improvement to enhance their risk management practices. Additionally, both industries recognize the importance of a strong safety culture and the need for effective communication and information sharing.

Differences in Approaches in Two Industries

While the aviation industry primarily focuses on operational safety and compliance, the insurance sector is more concerned with financial risk and loss prevention. Aviation risks are often categorized into catastrophic and attritional risks, with catastrophic risks being less frequent but more severe. In contrast, insurance underwriters often view attritional risks as greater due to the more frequent and smaller-scale occurrences that can accumulate over time.

Key Concerns Faced by Two Industries

Aviation Industry

- **Automation and technology:** Managing risks associated with the increasing use of automation and new technologies.
- **Supply chain and quality:** Ensuring the reliability and safety of supply chains.
- **Human factors:** Addressing issues related to human performance and mental health.
- **Climate change:** Mitigating risks from changing weather patterns and environmental conditions.
- **SMS effectiveness and safety culture:** Evaluating, addressing, and enhancing safety culture within organizations due to changes and turnover in the industry.

Insurance Underwriters

- **Consistency of information:** Desire for standardized and reliable safety data/information from clients during renewals.
- **Attritional losses:** Focusing on reducing frequent, smaller-scale losses.
- **Emerging risks:** Adapting to new and evolving risks, such as those related to AI and cabin air quality.
- **Geopolitical issues:** These issues may impact day-to-day operations and risk-based decision-making.

For example, some underwriters have identified several emerging risks, such as increasing liability claims per passenger and the economic impact of bird strikes, which result in significant financial losses for insurers. They also highlight the historical development of aviation insurance through risk-sharing mechanisms like aviation pools.

Potential Areas for Collaboration

- **Standardize safety information:** Standardization and commonality of safety information shared between airlines and underwriters.
- **Joint safety initiatives:** Collaborating on safety initiatives aimed at reducing attritional losses and enhancing overall safety culture.
- **Data sharing platforms:** Creating platforms for sharing safety data and best practices between the two industries.
- **Training and workshops:** Conducting joint training sessions and workshops to enhance understanding and collaboration on risk management practices.
- **Research and development:** Investing in R&D to address emerging risks and develop

innovative risk mitigation strategies.

Conclusion

The global aviation underwriting industry is a complex and dynamic market, essential for managing the unique risks associated with aviation operations. As the industry continues to evolve, underwriters must adapt to emerging challenges and leverage advanced risk management tools to provide effective insurance solutions. Enhanced collaboration between insurers and aviation operators, along with a proactive approach to safety and risk assessment, will be critical for sustaining growth and stability in this vital sector.

By understanding and aligning their risk management approaches, the aviation industry and insurance underwriters can work together to enhance safety and financial stability. Collaboration in areas such as standardized information sharing, joint safety initiatives, and continuous improvement can lead to significant advancements in risk management practices for both industries.