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EXECUTIVE COMMITTEE

Agenda Item 20: Innovation in Aviation

ENHANCING INNOVATION IN AVIATION

(Presented by Hermes Air Transport Organization (HERMES))

EXECUTIVE SUMMARY

The aviation industry must embrace innovative approaches to business operations and strategies to meet its economic, operational and environmental goals. To develop a shared vision of the innovations required by the industry, the Hermes Air Transport Organisation solicited briefs from associations representing a cross-section of the aviation industry. These briefs provide the basis for a broad set of recommendations on innovating in the aviation industry.

<i>Strategic Goals:</i>	This working paper relates to <i>The Economic Development of Air Transport Assures the Delivery of Economic Prosperity and Societal Well-Being for All</i>
<i>Financial implications:</i>	
<i>References:</i>	Hermes Air Transport Organisation: https://hermes.aero/?page_id=3536

1. INTRODUCTION

1.1 The aviation industry must embrace innovative approaches to business operations and strategies to meet its economic, operational and environmental goals. To develop a shared vision of the innovations required by the industry, the Hermes Air Transport Organisation solicited briefs from associations representing a cross-section of the aviation industry. These briefs provide the basis for a broad set of recommendations on innovating in the aviation industry, as presented below:

2. RECOMMENDATION 1: ADOPT A COLLABORATIVE APPROACH TO INNOVATIONS IN THE AVIATION INDUSTRY

2.1 Several briefs highlighted the importance of a collaborative approach to innovations in aviation.

2.2 The brief from the European Regions Airline Association (ERA) states: “Collaboration is essential if we are to unleash the potential of these new innovative technologies...”. The Civil Air Navigation Services Organization (CANSO) notes: “It is crucial to collaborate with key global bodies like ICAO to establish a unified framework that can be adapted to regional contexts.” The International Federation of Air Traffic Safety Electronics Associations (IFATSEA) asserts: “... [T]he challenges and barriers that hinder innovation, such as regulatory constraints, lack of resources and resistance to change, require concerted efforts to foster collaboration and provide strategies and best practices to foster innovation and creativity such as cross-disciplinary collaboration.” The International Transport Workers’ Federation (ITF) recommends: “[T]he establishment of national tripartite aviation bodies, including employers, regulators and union representatives from across the aviation service chain ... to develop and implement aviation policies and review existing policies to ensure adaptability.” The Joint Aviation Authorities Training Organization (JAA TO) states, “By emphasizing cross-disciplinary training, aviation professionals can develop a broader understanding of interconnected systems, promoting a holistic approach to safety and innovation.” Finally, the brief from ICAO states: “We work closely with all interested parties to share information, identify synergies, coordinate efforts and facilitate the implementation of innovation activities to achieve our objectives.”

3. RECOMMENDATION 2: ADOPT A PHASED APPROACH TO INNOVATIONS, WITH SHORT, MEDIUM AND LONG-TERM OBJECTIVES

3.1 The ERA notes that regional airlines will be the first to employ new propulsion technologies, since these technologies can be more easily adapted to smaller aircraft flying short-range routes, typically employed by regional operators. It is only after these technologies have been successfully employed by the regional carriers will they be adopted by the mainline operators.

3.2 CANSO discusses how air traffic management will be transformed in phases. For example: “A key short-term innovation is the initial integration of TBO [trajectory-based operations] principles into ATM operations. TBO focuses on managing aircraft trajectories in a more strategic manner, allowing for optimized flight paths, reduced fuel consumption, and enhanced airspace efficiency.” In the medium term: “Dynamically configuring airspace in response to real-time data and operational needs will optimize airspace usage and reduce congestion.” Finally, in the long run: “Further

increasing the level of automation in air systems will enhance efficiency, reduce workload, and improve safety in a fully integrated airspace environment.”

3.3 The brief from ICAO states: “In the short term, we need innovation that will allow aviation to evolve into something that is more safe, more secure, and more sustainable... In the long term we need revolutionary innovation that will get us to zero fatalities and zero net CO2 emissions while continuing to expand connectivity and affordability.”

4. RECOMMENDATION 3: INCORPORATE THE HUMAN ELEMENT INTO NEW TECHNOLOGY INNOVATIONS

4.1 ITF asserts: “Responsible deployment of technology can significantly enhance operational efficiency... Workers who engage in the work processes daily are crucial to identifying the needs, risks and potential consequences of technological innovation.”

4.2 JAA TO notes the importance of training humans in the implementation of new technologies. In outlining requirements for the successful implementation of uncrewed aircraft (i.e., drone) technology, JAA TO states: “Continuous training and skill development are essential equipping the workforce to implement these innovative solutions effectively. Regular training programs, workshops, and certification courses can ensure that aviation professionals stay abreast of the latest technological advancements and regulatory changes.”

4.3 The ICAO brief states: “The key driver to innovation is quite basic. It relies on a simple premise that the more people there are who are trying to solve a problem, the sooner and better it will be solved. Accordingly, a key element is to try to engage as many creative minds as we can to focus on the evolution and the revolution that we need.”

5. RECOMMENDATION 4: IMPLEMENT RISK, SAFETY, AND SECURITY MEASURES AS KEY COMPONENTS OF TECHNOLOGY ADOPTIONS

5.1 IFATSEA notes: “[T]he aviation industry must also address the challenges of legacy systems integration and cybersecurity risks to fully leverage the benefits of digital transformation. By investing in robust security measures and ensuring the smooth integration of new technologies, air navigation service providers and civil aviation authorities can create a secure and efficient digital ecosystem.”

5.2 JAA TO states that when implementing new technologies: “[M]inimizing the risk of security breaches remains paramount, as security incidents may soon result in an aviation safety occurrence.”

5.3 ERA adds: “With innovation brings new and additional risks that must be managed and mitigated, and the aviation sector is no different. The sector faces a constant barrage of cyberattacks on a regular basis, with all actors increasingly becoming targets for threats like Distributed Denial of Service (DDoS) attacks and ransomware. These attacks not only put pressure on organizations but also pose risks to safety.”

5.4 ITF notes: “Digitalization and other technologies bring forth a spectrum of opportunities for increased efficiency and sustainability. However, it also presents challenges, such as the risk of job displacement, the deskilling of the workforce, embedding inequalities into algorithmic processes and at worst, compromising safety track records.”

6. RECOMMENDATION 5: CAREFULLY CONSIDER THE FUNDING SOURCES FOR THE IMPLEMENTATION OF INNOVATIVE TECHNOLOGIES

6.1 The ICAO brief notes that, “Funding an innovation is contextual. It depends on a variety of factors ranging from the organizational mandates to prioritization of needs, resources and the dynamics of an ever-changing future world.”

6.2 ERA emphasizes the role of public-private partnerships (PPPs) in the funding of innovative technologies. It notes that PPPs can encourage innovation, and governments can facilitate PPPs by providing them with grants and tax incentives.

6.3 CANSO notes that some of the technological innovations, such as TBO, may be self-funded through the savings that are generated. CANSO states: “TBO will deliver material fuel savings and increased predictability, flexibility and scalability for airspace users. Transition costs are supported by those benefits, as investments will be recoverable from savings.”

6.4 On the other hand, JAA TO states that public funding is often required for the initial development of technologies, and it is only after the initial technological innovation that market-based funding takes over from the public funding initiatives.

7. CONCLUSION

7.1 The aviation trade association briefs offer a broad set of recommendations for successfully innovating in the industry. These recommendations include:

- a) adopt a collaborative approach to innovations. Include as many stakeholders as possible to ensure the widest implementation of innovations and new technologies;
- b) adopt a phased approach to innovations. Recognize that some practices can be adopted in the short term, but others will take considerable time to implement;
- c) incorporate the human element into technology innovations. Innovations will be successful only if trained and dedicated personnel work towards their adoption;
- d) implement risk, safety and security measures as key components of technology adoptions. The aviation industry must put safety and security first in the implementation of new technologies; and
- e) carefully consider funding sources for the implementation of new technologies. Some technologies can be funded through cost savings while others will require seed

money. The aviation industry must work cooperatively with all stakeholders to ensure that sufficient financing is available for technology adoptions.

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