International Civil Aviation Organization

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WORKING PAPER

ASSEMBLY — 40TH SESSION

EXECUTIVE COMMITTEE

Agenda Item 26: Other high-level policy issues to be considered by the Executive Committee

ONE AVIATION IN FACING TECHNOLOGICAL ADVANCEMENT

(Presented by Singapore and co-sponsored by Australia, Cook Islands, Marshall Islands, Nauru, Palau, Papua New Guinea, Samoa, Trinidad and Tobago, the United Kingdom, and the Civil Air Navigation Services Organisation (CANSO))

EXECUTIVE SUMMARY

The 7th World Civil Aviation Chief Executive Forum (WCACEF/7) 2019 in Singapore discussed the approach to technology adoption in aviation. The forum was attended by 115 leaders in international aviation from 75 States and 14 International Organisations including 27 Council Representatives. Delegates agreed on the need to leverage on technology for the advancement of aviation, especially in air traffic management. They also recognised challenges faced with the fast pace of technological advancement, requiring collaborative partnerships to reap optimal benefits for the whole aviation ecosystem. The Forum affirmed the need for long-term collaboration among partners and stakeholders to optimise the aviation ecosystem, and reiterated the importance of the long-standing ICAO framework of principles and policies to promote and integrate technological advances.

Action: The Assembly is invited to:

a) urge aviation stakeholders to work together to harness new technology and innovation through collaborative partnerships to achieve optimal benefits for the whole aviation ecosystem;
b) reaffirm the importance of ICAO's long standing principles and norms, including those on air traffic management (A35-15), and air navigation (A38-12) and technical cooperation (A39-16), and emphasise that the development and adoption of new technologies and innovation for the sector should be guided by these principles and norms;
c) recommend that ICAO establish new platforms to tap on the resources and expertise of the industry, and a trust-based framework for knowledge and data sharing amongst States to keep pace with technology and innovation; and
d) recommend that ICAO explores the establishment of industry technical forums to directly update industry and pursue the States endorsed technical recommendations emanating from ICAO high-level meetings such as the Air Navigation Conference or the High Level Safety Conference.

Strategic Objectives:	This working paper relates to all Strategic Objectives.
Financial implications:	Not applicable
References:	Resolution A35-15, *Consolidated statement of continuing ICAO policies and practices related to a global air traffic management (ATM) system and communications, navigation and surveillance/air traffic management (CNS/ATM) systems* Resolution A38-12, *Consolidated statement of continuing ICAO policies and associated practices related specifically to air navigation* Resolution A39-16, *Consolidated statement of ICAO policies on technical Cooperation*

1. INTRODUCTION

1.1 The 7th World Civil Aviation Chief Executives Forum with the theme "Advancing Aviation: Building Our Future Together was held from 8 to 10 April 2019 in Singapore. It was attended by 115 eminent global aviation leaders from 75 States and 14 International/Regional Organisations including 27 ICAO Council Representatives (participation list available at https://www.icao.int/Meetings/A40/Pages/documentation-reference-documents.aspx). The International Civil Aviation Organization (ICAO) Council President, Dr Olumuyiwa Benard Aliu, delivered the keynote address and participated in the discussions. The Forum deliberated on collaborative ways in harnessing technology towards collectively building a sustainable international aviation for the future.

2. DISCUSSION

2.1 The Forum participants recognised the important role technology and innovation have played to support aviation development and growth. These include advances in aircraft engines and airframes, data link communications between pilots and controllers, global navigation satellite system, automatic dependent surveillance – broadcast (ADS-B), airport collaborative decision making (A-CDM), as well as to e-ticketing for more comprehensive and seamless airport facilitation. These developments have collectively made international civil aviation safer and more efficient. Many started as novel ideas for some segments or States but are now widely adopted.

2.2 Participants agreed that new technology and innovation bring new capabilities and opportunities to further advance aviation development including addressing capacity demands that are expected to exceed projected air traffic growth in the future. There was consensus that new technologies are relevant and applicable to all States, ensuring that *No Country is Left Behind*. In particular, developing and least developed States can tap on technology to leap-frog the constraints of legacy systems, such as the use of drones to provide connectivity for remote and inaccessible areas.

2.3 Challenges

2.3.1 On the other hand, adopting new technology and innovation brings with it new challenges and risks. There are concerns over disruptive technology by non-traditional players, such as drone operators who are unfamiliar with the Rules of the Air and encroach into airport funnels and flight routes, potentially affecting flight operations and posing safety risks. Higher and higher degrees of automation in ATM systems, aircraft avionics, and other critical aviation systems create the potential for more safety risks, which more traditional forms of risk assessment and mitigation do not adequately address. Adapting to a new digital world would also require unlearning legacy processes.

2.3.2 Participants felt that regulation was not keeping pace with technology and innovation. Whilst technology upgrades occur rapidly, it can take ICAO five to seven years to adopt a new standard, with implementation taking even longer. Furthermore, many regulators prefer to act cautiously and conservatively; they were generally comfortable setting Standards only after the technology has matured.

2.3.3 There was recognition that regulators have a limited understanding of new technologies and innovations in fields such as advanced computing, networking, and cybersecurity. In many cases, the competencies, expertise and technical know-how reside with the industry. Yet, there is agreement that it is not an option for regulators to hold back technology development. Technology is becoming more pervasive and accessible. Restricting its use deprives the public of potential benefits in safety and efficiency in aviation. It would retard sustainable global development.

2.4 **Balanced and collaborative approach**

2.4.1 Policy makers and regulators must adopt a balanced, risk-based approach towards technology and innovation. Policies ought to be supportive towards emerging technology, whilst risks can be managed through a robust assessment and mitigation framework. These structures will need to evolve quickly as the technology develops. Increasingly, investing in research and development by regulators will be a necessity and norm.

2.4.2 At the same time, the fundamental principles and norms underpinning civil aviation continue to be relevant and critical. They should guide the development and adoption of new technology and innovations. This would help to ensure the continuing safety and efficiency of international civil aviation. These include the Chicago Convention and its Annexes, as well as the policies and guidance that Member States have collectively developed, such as Assembly Resolutions A35-15 on air traffic management, and A38-12 for air navigation.

2.4.3 There should also be greater collaboration between regulators. As technology develops, it is not practical for policymakers and regulators, especially smaller regulators, to individually develop sufficient technical depth to evaluate such technologies and facilitate the safe use of the technologies. Therefore, it would be necessary for policymakers and regulators to develop communities of practice to share their expertise, best practices, and experience to support and manage the introduction of these new technologies.

2.4.4 There must be collaboration to share information and expertise between regulators and the industry. A step-by-step approach, with industry and regulators working together in regulatory sandboxes to co-develop rules would be preferred.

2.4.5 ICAO as the organisation for international civil aviation should exercise leadership and facilitate collaboration between policy makers, regulators and industry, to ensure harmonisation and interoperability of aviation systems, and promote the safe and secure operations of international civil aviation. With Assembly Resolution A39-16 for technical cooperation in mind, ICAO should also work towards facilitating the development of expertise to manage new technologies. In this regard, it would be helpful for ICAO to play a role in building a circle of trust within the international aviation community and creating platforms where regulators worldwide could rely and trust to share privileged information. Also, ICAO could follow the best practices of other international organisations, such as the International Telecommunications Union (ITU), where valuable experience engaging with industry in forums and focus groups has yielded more timely, topical engagement from the global telecommunications industry with the member states of the ITU. Finally, ICAO should review whether the current structure and resources are adequate to support this impetus.

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