International Civil Aviation Organization

A41-WP/200
EX/88
2/8/22

WORKING PAPER

ASSEMBLY — 41ST SESSION

EXECUTIVE COMMITTEE

Agenda Item 23: Innovation in Aviation

REVIEW OF ICAO PROCESSES TO HELP RESPOND TO NEW AND EMERGING AVIATION TRENDS

(Presented by Canada, Japan and the United States)

EXECUTIVE SUMMARY

New trends in aviation, including RPAS*, Advanced Air Mobility (AAM), and autonomous aircraft systems have challenged some core assumptions upon which many SARPs are defined (e.g., flight rules, Air Traffic Management (ATM) systems, flight crew, pilot training). Addressing the challenges these new trends pose requires close collaboration with multiple stakeholder groups to ensure the impacts have been well considered. ICAO currently has a process through which a technical proposal may be directly submitted to the Air Navigation Commission (ANC) for review and consideration (bypassing the typical ICAO Panel format). This direct submission process allows for a more timely review of proposals and could be used as a basis to serve the needs of aviation innovators and to more effectively utilize international resources to update standards and guidance. To achieve this the process would need to be transformed to support a programmatic approach in managing proposals, initiating changes, and following-up on outcomes.

*In Canada, the gender-neutral terminology of RPAS is used to refer to drones at large and in place of Unmanned Aircraft Systems (UAS) or Unmanned Aerial Vehicles (UAV).

Action: The Assembly is invited to:

a) Encourage ICAO to consider inclusion of the foundational principles presented in paragraph 2.4 in its current review of the Direct Submission process with the goal of more effectively activating international aviation groups recognized by ICAO in developing innovative solutions and improving Standards and Recommended Practices (SARPs) and guidance documents. Recommended principles include transparency, integration with ICAO Panel work, programmatic oversight, and inclusion of content guidelines (e.g., to ensure submission is well-scoped).

Strategic Objectives:	This working paper relates to Strategic Objectives of safety and the economic development of air transport.
Financial implications:	No financial implications anticipated.
References:	

1. INTRODUCTION

1.1 The adoption of technology in aviation has always been highly regulated with the goal of avoiding impacts to public safety. The history of the expansion of aviation has been one of technological innovation, learning from the failings of those technologies, and applying those lessons to current and future operations. While this approach has been historically successful, recent advances in technology (e.g., electric propulsion, high-bandwidth communication networks, ultra-lightweight materials) and operational capability (e.g., high-altitude operations, remotely piloted operations) have created the conditions for a transformative moment in aviation. This transformation cannot be enabled without the support of regulatory and standardization frameworks, which accommodate these novel, approaches to delivering aviation services.

1.2 The current international regulatory framework does not provide the flexibility to accommodate the deployment and operation of these novel technologies. The current Standards and Recommended Practices (SARPs) have been developed over time through iterative learning processes to provide the best minimum requirements for safe and efficient operations of passenger aircraft, and while the SARPs are well tailored for the technologies currently deployed they do not yet accommodate for novel types of operations. The development of SARPs has traditionally been managed by the Air Navigation Commission (ANC) through the Panel process which brings together subject matter experts from around the world to develop the standards and recommended practices for international operations. While this process is the bedrock that the International Civil Aviation Organization (ICAO) SARPs are developed on, increasing pressures from new and novel operations, as well as responding to incremental updates in traditional aviation technology, has stretched many panels to their limits in both available personnel and deliverable timelines.

1.3 ICAO has recognized some of these limitations and in response to States asking for additional responsiveness to innovators, Council empowered a Small Group on Innovation to evaluate ICAO initiatives and report on outcomes. As part of this effort the small group assessed the effectiveness of the “Direct Submission for Time-Based Separation (TBS) minima in case of wake turbulence” which was a pilot program developed to evaluate how to develop a concept outside of ICAO and bring the concept into the international regulatory framework. At the time of writing, the details and recommendations of this report are still unclear, but continued development and refinement of ICAO processes in response to on-going innovation is a positive step towards ensuring a responsive international regulatory environment.

2. DISCUSSION

2.1 Innovation in aviation is a challenge that many states have evaluated and the approaches to safely accommodate changes in aviation continue to evolve. There are many examples of domestic and regional programs which attempt to tackle the innovation challenge in different ways, from the Canadian Drone Strategy[1], to the United States Non-Required Safety Enhancing Equipment Policy[2], to the European Union Single European Sky Air Traffic Management (ATM) Research Project[3]. While these programs each target different aspects of aviation, they all attempt to produce recommendations and approaches to the evaluation of technology to improve safety outcomes and operational efficiencies.

[1] https://tc.canada.ca/sites/default/files/2021-03/TC223-Drone-Strategy-ENG-ACC.pdf
[2] https://rgl.faa.gov/Regulatory_and_Guidance_Library/rgPolicy.nsf/0/1790b02f1833357486257f9200592110/$FILE/PS-AIR-21.8-1602.pdf
[3] https://www.sesarju.eu

Translating these outcomes into direct and actionable changes to the aviation regulatory frameworks continues to challenge regulators.

2.2 The major challenge is with respect to timelines of the regulatory processes with even simple changes (e.g., recognition of new industry consensus standards) taking many months or even years to propagate through the regulatory approval process. While there have been some successes in revising the regulatory processes to be more flexible (e.g., the multi-national approach to developing a small airplane certification basis) the struggle to respond to technological advancements, especially those which challenge the foundations of regulatory frameworks (e.g., autonomous aircraft) continues to limit the application of novel technologies in aviation applications. In many cases the timeliness of policy development is lagging technology, but through improving the policy development processes to engage early in new capability development and deployment, while maintaining transparency with a broad group of diverse stakeholder groups, policy outcomes may be more widely supportive of new and emerging technologies.

2.3 The Direct Submission process developed by ICAO has been an attempt to provide such a policy development tool. The process allows for a modification to the SARPs or guidance document to be directly submitted to the ANC for review (with the support of impacted Panel working groups) and propagation to States via State Letters for assessment. This approach provides the ability for ICAO to adopt changes to SARPs and guidance documents more quickly by evaluating submissions on their impact and risk and providing proposals to States for feedback. The process as it currently stands relies on the direct submission to be clear in scope, have a good understanding of the impacts on the Annexes and associated documents, and be very mature in the specific changes proposed. This makes the program as currently designed, well suited for simple updates such as adopting a new revision of a referenced industry standard but does not allow it to address more holistic issues which impact multiple subject areas. To realize the potential of the innovation occurring in aviation the Direct Submission process should continue to be evaluated and evolved to address the needs of more complex changes in the aviation ecosystem.

2.4 While recognizing that ICAO's review of the Direct Submission process is ongoing, it is recommended that some foundational principles are considered as part of the review. The first is to ensure transparency in the process whether it be providing clear guidelines on what is required for a submission to be accepted, the stage in the process of a particular submission, or the outcomes of consultations maintaining transparency throughout is foundational to State acceptance of Direct Submission outcomes. In support of transparency, clear guidelines on the scope of submissions (e.g., how broadly the proposed change will impact international aviation) as well as clear expectations for what should be included (e.g., safety risk management material or data), and what constitute a submission (e.g., proposed SARPs, red-lined versions of Docs), are necessary to ensure consistent quality of submissions and to support the timeliness of outputs throughout the process. Additionally, the Direct Submission process should have a strong integration with Panel work, as future submissions may be of sufficient scope to warrant close coordination with Panels and their existing work priorities. Finally, the Direct Submission process should continue to have strong programmatic oversight to ensure timeliness of outcomes as well as ensuring the process is continuing to deliver value to ICAO stakeholders. When taken together these foundations will help ensure the Direct Submission process is a policy tool that can help advance the ICAO regulatory agenda without creating confusion or additional burden amongst the community.

3. CONCLUSION

3.1 While ICAO continues to develop the Direct Submission process through their pilot programs and considers updates to more effectively engage external entities which develop aviation technology, standards, and regulations the Assembly is invited to:

a) Encourage ICAO to consider inclusion of the foundational principles presented in paragraph 2.4 in its current review of the Direct Submission process with the goal of more effectively activating international aviation groups recognized by ICAO in developing innovative solutions and improving SARPs and guidance documents. Recommended principles include transparency, integration with ICAO Panel work, programmatic oversight, and inclusion of content guidelines (e.g., to ensure submission is well-scoped).

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