



WORKING PAPER

ASSEMBLY — 42ND SESSION

TECHNICAL COMMISSION

Agenda Item 24: Aviation Safety and Air Navigation Priority Initiatives

DEVELOPING REGULATORY STANDARDS FOR LICENSING AND CERTIFICATION OF PILOTS AND OPERATORS IN THE URBAN AIR MOBILITY ERA

(Presented by Kazakhstan)

EXECUTIVE SUMMARY

This working paper proposes the development of ICAO-level regulatory standards for the licensing and certification of pilots (including remote pilots) and operators engaged in urban air mobility (UAM) activities, particularly those conducted for commercial purposes. As UAM technologies advance and integrate into low-altitude airspace in urban environments, harmonized international standards are urgently needed to ensure safety, efficiency, and scalability. This paper outlines the emerging challenges, highlights regulatory gaps, and calls for the establishment of ICAO provisions tailored to this rapidly evolving sector.

Action: The Assembly is invited to:

- a) recognize the urgency of establishing ICAO-level regulatory provisions for licensing UAM pilots (remote pilots) and certifying UAM operators, depending on the type of aviation operation performed and the level of human involvement;
- b) request the ICAO Council to initiate the development of Standards and Recommended Practices (SARPs) tailored to UAM licensing and operational certification, leveraging existing work by the Advanced Air Mobility Study Group (AAM SG) and Unmanned Aircraft Systems Advisory Group (UAS-AG);
- c) encourage the publication of interim guidance material to support national authorities in developing consistent and interoperable UAM frameworks; and
- d) invite Member States and stakeholders to actively participate in shaping these provisions through relevant ICAO expert groups and consultations.

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| <i>Strategic Goals:</i> | This working paper relates to <i>Every Flight is Safe and Secure</i> . |
| <i>Financial implications:</i> | The financial impacts will depend on approved decisions. |
| <i>References:</i> | Annex 1 — <i>Personnel Licensing</i> Doc 10019, <i>Manual on Remotely Piloted Aircraft Systems (RPAS)</i> ICAO UAS Toolkit and UTM Framework, <i>Unmanned Aircraft Systems Traffic Management (UTM) – A Common Framework with Core Principles for Global Harmonization Edition 4</i> |

1. INTRODUCTION

1.1 Urban air mobility (UAM) represents a transformative shift in air transportation, utilizing electric vertical take-off and landing (eVTOL) vehicles and autonomous systems to enable short-range air transport in urban and suburban environments.

1.2 With increasing investment and pilot projects in UAM across the globe, there is a growing urgency to define regulatory frameworks for the licensing of pilots (both human and remote) and the certification of commercial operators involved in UAM services.

1.3 UAM operations typically occur in complex, low-altitude urban airspace, raising safety, interoperability, and airspace integration concerns.

1.4 Without harmonized international standards, States are pursuing to develop their own regulatory models, potentially leading to fragmentation and reduced interoperability for commercial UAM providers.

2. BACKGROUND AND CONTEXT

2.1 ICAO Annex 1 — *Personnel Licensing* provides the licensing framework for aviation personnel, including pilots and remote pilots. However, current provisions do not fully account for the operational realities of UAM.

2.2 UAM operations involve a spectrum of pilot involvement, from fully piloted aircraft to highly automated or autonomous systems and demand flexible, risk-proportionate certification mechanisms for both pilots and operators.

2.3 Clear distinctions must be made between commercial and non-commercial UAM activities, including thresholds for licensing and oversight.

2.4 ICAO initiatives such as the Advanced Air Mobility Study Group (AAM SG) and the Unmanned Aircraft Systems Advisory Group (UAS-AG) provide a strong foundation but have not yet resulted in SARPs for pilot licensing and operator certification in the UAM context.

3. DISCUSSION

3.1 Without harmonized international standards, UAM operators face uncertainty and high regulatory variability, which can hinder innovation, increase compliance costs, and slow safe integration into civil airspace.

3.2 ICAO is uniquely positioned to lead global efforts in standardizing licensing criteria for UAM pilots and defining safety, training, and operational requirements for commercial UAM operators.

3.3 Key areas requiring regulatory attention include:

- a) defining licensing categories for UAM pilots, including remote or autonomous operators;

- b) establishing minimum training, experience, and medical fitness requirements suitable for urban low-altitude operations;
- c) developing certification criteria for commercial UAM operators, including maintenance, operations, and safety oversight;
- d) addressing human factors, automation interaction, and contingency procedures in urban settings; and
- e) ensuring integration with UTM (UAS traffic management) systems and other airspace users (traditional air traffic management (ATM) systems, etc.).

3.4 A phased and risk-based approach may be appropriate, beginning with piloted operations and progressing toward highly automated and autonomous platforms such as data, societal trust, and technology mature.

3.5 Lessons learned from existing regulatory models (e.g. for RPAS, Part 135 operators, or eVTOL trials) can inform the development of ICAO SARPs and guidance material.

4. WAY FORWARD

4.1 ICAO should prioritize the establishment of a dedicated regulatory workstream, potentially within the AAM Study Group or equivalent expert group, to develop SARPs related to pilot licensing and operator certification in the commercial UAM context.

4.2 This initiative should be supported by collaboration with States, industry innovators, and other stakeholders, ensuring a balanced approach that promotes both safety and innovation.

4.3 ICAO should consider issuing an initial guidance document or manual capturing best practices and interim recommendations, to support States developing early-stage UAM frameworks.

4.4 Future SARPs should incorporate tiered licensing options based on levels of automation, operational complexity, and risk profile.

5. CONCLUSION

5.1 The development of licensing and certification standards for UAM operations presents a unique opportunity to shape the future of aviation. By enabling safe, equitable, and efficient deployment of next-generation air mobility solutions, ICAO can inspire global confidence and unlock transformative benefits for societies worldwide. Bold and timely leadership will not only bridge regulatory gaps but also help realize a shared vision of accessible, sustainable, and innovative urban air transportation.