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WORKING PAPER

ASSEMBLY — 42ND SESSION

LEGAL COMMISSION

Agenda Item 28: Work Programme of the Organization in the Legal Field and Consolidated Statement of Continuing ICAO Policies in the Legal Field

HARMONIZATION OF AVIATION LIABILITY LAWS IN THE ERA OF AUTONOMOUS FLIGHT: DEFINING RESPONSIBILITY IN AI-OPERATED FLIGHTS AND UNMANNED COMMERCIAL AIR TRANSPORT

(Presented by the Republic of Kazakhstan)

EXECUTIVE SUMMARY

The emergence of AI-operated and unmanned commercial air transport raises fundamental questions about legal responsibility and liability. While current conventions—such as the *Convention for the Unification of Certain Rules Relating to International Carriage by Air* **(Warsaw Convention 1929)** and the *Convention for the Unification of Certain Rules for International Carriage by Air* **(Montreal Convention 1999)**—continue to govern air carrier liability, their applicability to fully autonomous or AI-directed flights is uncertain. These frameworks were developed for human-operated aviation and do not adequately reflect the complexities of autonomous systems, including the delegation of decisions to software or machine-learning models.

Legal definitions of terms such as "carrier," "accident," and "operational control" may not map directly to scenarios where no pilot is onboard, or where responsibility is shared across software developers, manufacturers, and operators. While these conventions might apply by analogy, they lack specific provisions that clearly allocate responsibility in such technologically advanced environments.

This working paper proposes that ICAO initiate focused legal work to explore a harmonized international instrument—whether a new convention or a supplementary protocol—to clearly define liability and compensation mechanisms in the context of autonomous aviation.

Action: The Assembly is invited to:

a) Recognize that current international liability conventions do not comprehensively address the operational realities of autonomous and AI-operated aviation
b) Recommend that ICAO initiate work toward developing a dedicated legal framework or supplementary instrument clarifying liability and compensation standards in such contexts
c) Encourage close coordination with States, the legal community, aviation manufacturers, AI developers, and insurance entities
d) Propose the establishment of a Legal Study Group on Autonomous Aviation Liability under the ICAO Legal Committee.

Strategic Goals:	This paper relates to ICAO's Strategic Goal: The International Civil Aviation Convention and other Treaties, Laws and Regulations address all Challenges
Financial implications:	The financial impacts will depend on approved decisions.
References:	*Convention for the Unification of Certain Rules Relating to International Carriage by Air* (Warsaw Convention, 1929) Doc 9740, *Convention for the Unification of Certain Rules for International Carriage by Air* (Montreal Convention, 1999) Doc 7364, *Convention on Damage Caused by Foreign Aircraft to Third Parties on the Surface* (Rome Convention,1952) Doc 10019- *Manual on Remotely Piloted Aircraft Systems (RPAS)* ICAO Assembly Resolution A41-6 – *ICAO Global planning for safety and air navigation*

1. INTRODUCTION

1.1 Autonomous and AI-directed technologies are becoming increasingly embedded in aviation operations. From remotely piloted aircraft to fully autonomous commercial air transport concepts, aviation is entering a new era where non-human actors may hold critical decision-making responsibilities.

1.2 Current liability structures are largely rooted in the assumption of human control. However, distributed technological responsibilities blur traditional definitions of operator, pilot-in-command, and accountable entity.

1.3 Without legal clarity, differing national interpretations may arise, undermining harmonization and affecting insurance coverage, accident investigations, and compensation processes.

2. BACKGROUND

2.1 The Montreal Convention 1999—and its predecessor, the Warsaw Convention 1929—provide rules governing air carrier liability in international carriage. These rules are designed with the expectation that a human pilot and a defined air carrier assume operational control.

2.2 In the autonomous context, the traditional actor roles become diffused: - The “operator” may be a software provider, drone network manager, or automated system. - Human pilots may be absent altogether. - Decision-making might depend on AI algorithms, which lack legal personality.

2.3 These realities create interpretational challenges in applying existing treaties: - What constitutes an “accident” when no human is present? - Who is the liable party when the AI’s decisions are influenced by machine learning? - Can liability be apportioned across multiple stakeholders, and if so, how?

2.4 While ICAO has made progress on RPAS (Remotely Piloted Aircraft Systems) through Doc 10019, and the Legal Committee has discussed emerging issues, there is no dedicated treaty or protocol that defines liability structures in autonomous commercial aviation.

2.5 A proactive ICAO initiative would offer clarity and prevent a patchwork of divergent national solutions.

3. ANALYSIS

3.1 Current international conventions may apply to autonomous operations by analogy, but they do not explicitly resolve core issues such as: - Assignment of liability in machine-led decision-making - Compensation to passengers and third parties - Coordination between operators, manufacturers, AI developers, and States.

3.2 Moreover, States have different legal traditions—common law, civil law, mixed systems, and customary legal frameworks—each interpreting liability and negligence in their own context. Only a harmonized, treaty-based framework can accommodate these differences while ensuring global coherence.

3.3 ICAO is uniquely positioned to lead this work by: - Facilitating international dialogue through its Legal Committee - Supporting the drafting of principles and model clauses - Encouraging information exchange between Member States and industry.

4. WAY FORWARD

4.1 ICAO may consider a two-phase approach:

a) First, develop legal guidance materials to support national regulators, manufacturers, and operators on handling liability in autonomous aviation.

b) Second, based on feedback and consensus, explore the development of a supplementary protocol or a dedicated new convention to address liability, including options for:

i) Defining new accountable roles (e.g., autonomous operator, software manager)
ii) Assigning compensation obligations
iii) Clarifying jurisdiction, responsibility, and legal standing of non-human agents.

5. CONCLUSION

5.1 The future of civil aviation will undoubtedly involve increasing levels of autonomy and machine intelligence. The legal system must evolve in parallel to maintain safety, accountability, and justice.

5.2 ICAO has an opportunity to act pre-emptively, guiding States and stakeholders toward a common legal understanding of responsibility and compensation in this new frontier.

5.3 A harmonized legal framework would serve as a cornerstone of trust, operational certainty, and legal integrity in autonomous civil aviation.

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