



WORKING PAPER

ASSEMBLY — 42ND SESSION

EXECUTIVE COMMITTEE

Agenda Item 20: Innovation in Aviation

HARNESSING ARTIFICIAL INTELLIGENCE FOR STANDARDIZED AND ENHANCED AVIATION OVERSIGHT

(Presented by the United Arab Emirates)

EXECUTIVE SUMMARY

This working paper addresses the strategic imperative for the standardized integration of Artificial Intelligence (AI) within Civil Aviation Authorities (CAAs) and regional cooperation mechanisms. It highlights AI's transformative potential in regulatory oversight, particularly given global manpower shortages and increasing operational complexity. It underscores the necessity for ICAO's leadership in harmonizing and standardizing AI practices globally. It proposes a dedicated global seminar hosted by the United Arab Emirates in 2026 explicitly focused on AI integration within civil aviation authorities (CAAs), and regional cooperation mechanisms, emphasizing regulatory oversight, governance frameworks, and accountability mechanisms, distinct from existing ICAO AI events focused on operational, industry, and innovation applications.

Action: The Assembly is invited to:

- a) recognize the significant potential and emerging necessity of integrating AI within CAAs' and regional cooperation mechanisms oversight functions;
- b) support the United Arab Emirates' initiative to host an ICAO-supported global seminar in 2026 specifically dedicated to regulatory, oversight, and governance aspects of AI integration within CAAs and regional cooperation mechanisms, distinguishing its scope from ICAO's existing operationally focused AI forums, and request active ICAO Secretariat support in organizing the seminar;
- c) invite the ICAO Secretariat, under the direction of the Secretary General and in coordination with the Council, to provide technical and logistical support for the planning and delivery of the proposed global seminar on artificial intelligence, which will be fully hosted and financially supported by the United Arab Emirates; and
- d) support ICAO in the study, review and possible development of guidance for States and regional cooperation mechanisms for the use of AI to support their regulatory oversight needs.

<i>Strategic Goals:</i>	This working paper relates to <i>Every Flight is Safe and Secure</i> .
<i>Financial implications:</i>	Expected activities fall within the available ICAO budgetary resources, supported potentially by voluntary contributions from Member States.
<i>References:</i>	Doc 10140, <i>Assembly Resolutions in Force (as of 4 October 2019)</i> Doc 10004, <i>2023-2025 Global Aviation Safety Plan</i> Doc 9750, <i>Global Air Navigation Plan</i>

1. INTRODUCTION

1.1 Civil Aviation Authorities (CAAs) worldwide increasingly face operational complexities due to growing air traffic, evolving technological landscapes, and persistent manpower shortages. Regional cooperation mechanisms such as Regional Safety Oversight Organizations (RSOOs) and Regional Accident and Incident Investigation Organizations (RAIOs), which were created to help Member States fulfil their safety responsibilities, are also experiencing similar challenges. Together, these factors place considerable strain on conventional oversight and regulatory capacities.

1.2 Artificial Intelligence (AI) offers a transformative solution that can significantly enhance regulatory oversight by automating routine tasks, improving predictive analytics, and increasing overall safety and efficiency in aviation operations. The global adoption of AI is progressing unevenly, potentially exacerbating disparities among States. Harmonized ICAO guidance and capacity-building under the No Country Left Behind (NCLB) initiative will ensure equitable access and capability development for all States and regional cooperation mechanisms, preventing regulatory fragmentation and fostering global consistency.

1.3 ICAO has conducted global summits addressing AI in aviation, primarily from operational, industrial, and innovation standpoints, with a focus on broader aviation industry applications. The proposed United Arab Emirates seminar is strategically distinct, concentrating explicitly on the regulatory integration and governance frameworks of AI within CAAs. It will explore critical oversight and ethical considerations from the regulator's perspective, an area not comprehensively covered by previous ICAO AI initiatives.

2. GLOBAL LANDSCAPE OF AI IN AVIATION AUTHORITIES

2.1 Leading CAAs, including the Federal Aviation Administration (FAA), the United Kingdom CAA and the European Union Aviation Safety Agency (EASA) have developed or launched AI-driven strategic frameworks to enhance their regulatory oversight.

2.2 The FAA's AI initiatives include AI-driven safety analytics, predictive risk assessment, and process automation. The FAA's incremental and cautious approach emphasizes safety assurance through rigorous validation and oversight.

2.3 The United Kingdom CAA's AI strategy prioritizes human-in-the-loop governance and has started piloting AI solutions in surveillance, risk-based oversight, and document processing. Their approach emphasizes transparency, accountability, and ethical integration.

2.4 EASA has proactively created a comprehensive AI roadmap that outlines clear guidelines for certification, standardization, ethical governance, and human oversight.

2.5 The United Arab Emirates General Civil Aviation Authority (GCAA) has made notable progress in applying AI for regulatory duties, such as automated inspection procedures, real-time data analysis for predictive risk evaluation, and customer service automation through intelligent assistants as part of the United Arab Emirates GCAA AI Strategy.

3. NEED FOR GLOBAL STANDARDIZATION AND ICAO'S ROLE

3.1 The absence of harmonized guidance and global standards on how CAA's and regional cooperation mechanisms can use AI to support their regulatory oversight presents a significant risk of regulatory fragmentation. Divergent approaches can diminish mutual trust in oversight processes and hinder international collaboration and interoperability.

3.2 ICAO's global leadership is essential not only for addressing emerging gaps but also for ensuring that the adoption of AI in oversight is inclusive and aligns with the NCLB initiative. Furthermore, standardized integration of AI will advance ICAO's digital transformation and innovation objectives, enhancing oversight capabilities and regulatory readiness across all Member States.

3.3 Global standards established by ICAO should create baseline validation criteria, ensure interoperability, promote mutual recognition of regulatory outcomes among ICAO Member States, and explicitly include governance principles such as ethical standards, transparency, and accountability mechanisms.

4. PROPOSED ICAO-SUPPORTED GLOBAL SEMINAR IN 2026

4.1 The United Arab Emirates proposes to host an ICAO-supported global seminar in 2026 explicitly focused on the regulatory and oversight integration of AI within civil aviation authorities. This seminar will concentrate on governance frameworks, ethical standards, accountability, and policy development, clearly distinguishing itself from ICAO's existing operational and innovation-focused AI initiatives. The seminar aims to:

- a) share experiences and lessons learned from pioneering States;
- b) explore potential global standards and governance frameworks, explicitly addressing the training and capacity-building needs of developing States under ICAO's NCLB initiative, and identifying critical digital competencies required in CAAs to support ICAO's Next Generation of Aviation Professionals (NGAP) objectives. The seminar will foster institutional innovation in line with ICAO's digital transformation agenda;
- c) identify and develop pilot programmes among volunteer Member States and/or regional cooperation mechanisms to test AI applications; and
- d) foster capacity-building initiatives for Member States, particularly developing nations.

4.2 Additionally, the seminar will evaluate the establishment of a dedicated and continuous ICAO workstream or permanent mechanism. This body will ensure sustained international collaboration, standardized AI governance, ongoing digital competency development in CAAs, and constant support aligned with ICAO's broader strategic objectives, including NCLB, NGAP, and digital transformation. The seminar may also serve as a foundation for a regularly recurring ICAO platform on AI oversight, subject to the interest of Member States and Council deliberations.

4.3 The seminar would involve ICAO, Member States, regional cooperation mechanisms, industry experts, academia, and international organizations, providing diverse perspectives essential for developing robust and practical guidelines.

5. EXPECTED DISCUSSIONS

5.1 The seminar will discuss various important aspects including:

- a) the right role for ICAO which may include the establishment of a dedicated ICAO Task Force or Expert Working Group to drive standardization, develop guidance material, and coordinate targeted capacity-building initiatives aligned with NCLB principles. This body will also identify and recommend strategies to cultivate digital skills and professional competencies among aviation regulators, directly supporting NGAP objectives;
- b) the assessment of the necessity for creating an ICAO mechanism or expert group specifically focused on AI governance and regulatory oversight, offering consistent support and guidance to CAAs worldwide;
- c) the sharing of best practices and the right level of ICAO guidance material on AI integration and implementation; and
- d) capacity-building programmes tailored for Member States.

5.2 The United Arab Emirates will compile the outcomes of this seminar into a comprehensive summary report and will submit the report to the ICAO Council through a formal council working paper (C-WP), with the objective of informing the Council's deliberations on the future of artificial intelligence in civil aviation. Subject to the Council's review and guidance, this process may lead to the development of strategic recommendations and potential guidance material, which could be considered, as appropriate, during preparatory work leading up to the 43rd Session of the ICAO Assembly.

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