International Civil Aviation Organization

WORKING PAPER

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EXECUTIVE COMMITTEE

Agenda Item 18: Capacity Development and Implementation Support – Policy and Activities

DESIGN OF AN ARTIFICIAL INTELLIGENCE IMPLEMENTATION PACKAGE FOR CIVIL AVIATION INSTRUCTION CENTERS

(Presented by the Dominican Republic)

EXECUTIVE SUMMARY

Artificial Intelligence (AI) has emerged as a fast-growing and disruptive innovation. However, civil aviation training centers still lack guidelines for its safe, effective, and scalable implementation.

This paper proposes the development of an implementation package (iPack) to support the integration of AI technologies in civil aviation training centers. The iPack would aim to strengthen institutional capabilities, update teaching methods, promote pedagogical innovation and help adapt aviation training to the challenges of digitalization and automation. In doing so, it would enhance the competencies required to address current aviation challenges, improve the quality and adaptability of training, and ultimately reinforce aviation safety.

Action: The Assembly is invited to:

a) agree on the content of this paper;
b) request the Council to develop guidance on the design of an artificial intelligence (AI) implementation package (iPack) for civil aviation training centers through ICAO's Capacity Development and Implementation Bureau (CDI).

Strategic Goals:	This working paper relates to the following Strategic Goals: *Every Flight is Safe and Secure, Aviation Delivers Seamless, Accessible and Reliable Mobility for All, The Economic Development of Air Transport Assures the Delivery of Economic Prosperity and Social Well-being for All, Aviation is Environmentally Sustainable* and *No Country Left Behind.*
Financial implications:	The activities referred to in this working paper are expected to be undertaken within the resources available in the 2025-2028 Regular Budget and/or from voluntary contributions.
References:	ICAO Products and Services Catalogue, *Implementation Package (iPack).* Resolution A41-25, *Consolidated statement of ICAO policies on technical cooperation and technical assistance, Appendix B - Funding of the Technical Cooperation and Technical Assistance Programmes*. Annexes to the Chicago Convention

[1] Spanish version provided by the Dominican Republic

1. INTRODUCTION

1.1 Artificial intelligence (AI) has emerged as a strategic tool for the future of civil aviation, particularly in the field of training. The progressive integration of AI into training centers provides an opportunity to modernize teaching methods, align content with operational needs and enhance the quality and efficiency of aviation training.

1.2 Artificial intelligence is reshaping the industry by delivering readily accessible training. AI-powered training applications will become an essential tool for the effective delivery of curricula at all levels, offering customized training solutions, real-time assistance, scenario simulation, performance measurement, and adaptable programs that evolve alongside AI. These tools are redefining the approach to aviation training, including the development of new capabilities at civil aviation training centers worldwide.

1.3 AI has a role to play in every area of aviation. This technology will provide advanced assistance to aviation professionals and optimize processes in ways that would otherwise be impossible, thereby contributing to an even safer and more sustainable aviation sector.

1.4 While AI has emerged as a fast-growing and disruptive innovation, civil aviation training centers currently lack standardized guidance and recommendations specifically tailored to their needs for integrating AI into their activities.

1.5 This paper proposes the design of an implementation package (iPack) to guide the integration of AI in training centers, aiming to build effective and modern aviation training capabilities. An iPack provides States with comprehensive technical assistance through guidance material, practical tools and expert support to strengthen their effective implementation of Standards and Recommended Practices (SARPs).

2. DISCUSSION

2.1 The introduction of AI technologies into aviation training represents a transformative opportunity for training centers, both for its potential to improve teaching efficiency and for its contribution to updating the competencies required by the new generation of aviation professionals. In response to this technological evolution and the growing demands of the industry, it is proposed that ICAO develop an iPack to promote the progressive integration of AI into civil aviation training centers. The iPack would help build institutional and technical capabilities while fostering a culture of innovation.

2.2 The main goals of an AI iPack for civil aviation training centers are to:

a) **Facilitate understanding of AI:** Provide educational resources explaining AI fundamentals and its applications in aviation.

b) **Develop competencies:** Provide tools and courses that enable instructors and students to acquire practical skills in the use of AI.

c) **Promote educational innovation:** Foster an environment that encourages experimentation and testing of innovative and flexible AI-based solutions to improve teaching/learning processes.

2.3 An ICAO iPack should include the following components:

2.3.1 **Expert advice**
A helpline should be set up to answer questions about AI implementation. This includes tailored advice to adapt AI solutions to the specific needs of each training center.

2.3.2 **Training**
The iPack should consist of a structured set of training programs, such as online courses or other suitable formats, covering AI fundamentals and their applications in international civil aviation. These programs should also include interactive sessions and workshops featuring simulations, case studies, and practical scenarios.

2.3.3 **Guidance material**
Guidance material developed for the iPack shall include clear references to Standards and Recommended Practices (SARPs) as well as relevant technical documents, manuals and guides on the use of AI tools in aviation training. Also, the development and inclusion of AI-based software for simulation and data analysis is recommended, enabling training centers to modernize their teaching methodologies and improve student performance assessment.

2.3.4 **Training tools**
The implementation package should include a toolkit for training centers to update and expand their training programmes with AI, fostering educational innovation. This will allow training centers to design customized training programmes. The iPack should also provide checklists, decision-making support and guidance on meeting the requirements to become an approved training organization (ATO) in relation to new AI tools.

2.4 **Implementation recommendations**

a) **Collaboration:** Involve AI and civil aviation experts in the design of the iPack to ensure practical and relevant solutions and promote collaboration between industry and academia.

b) **Adaptability:** Design the iPack to be flexible and easily tailored to different contexts and needs.

c) **Innovation culture:** Incorporate innovation competencies, emerging technologies, and modern teaching methods; support the development of ICAO courses and promote incentives; recognize and certify best practices; and provide guidance for research and development.

d) **Assessment and continuous improvement:** Implement tools to measure the effectiveness of learning and the integration of AI into training programs. Require systematic feedback from centers to improve training modules.

2.5 It is recommended that the iPack design incorporates principles of flexibility and scalability, allowing it to be adapted to different institutional contexts. Adaptability will be particularly important when aligning the package with the competencies of personnel responsible for implementing Standards and Recommended Practices (SARPs). It is also proposed that recognition and certification of best practices be fostered, that incentives be offered to centers adopting innovative solutions, and that research and development initiatives in this field be supported.

3. CONCLUSION

3.1 The development of an AI iPack for civil aviation training centers is a concrete and strategic action to strengthen global aviation training capabilities. This proposal directly addresses the transformations driven by digitalization and automation, aligning with ICAO's strategic objectives and the urgent need to train the next generation of aviation professionals.

3.2 The design of an iPack for integrating AI into aviation training centers will accelerate the transition to more efficient, personalized, and resilient training models that meet the sector’s current demands, enhancing both the quality and flexibility of training as well as aviation safety.

3.3 This paper could have a positive impact on the efficiency of training for personnel responsible for SARP implementation.

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