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AGENDA ITEM 8: CAPACITY DEVELOPMENT AND IMPLEMENTATION

# INDONESIA'S EXPERIENCE IN STRENGTHENING REGIONAL AVIATION CAPACITY THROUGH STRATEGIC PARTNERSHIPS AND SMART LEARNING: SUPPORTING A FUTURE-READY AVIATION WORKFORCE FOR SMART SKIES

(Presented by The Republic of Indonesia)

**INFORMATION PAPER**

**SUMMARY**

This paper presents Indonesia's experience in strengthening aviation workforce development through strategic partnerships, smart learning approaches, and regional cooperation. Drawing upon capacity-building initiatives conducted with ICAO, the United States Federal Aviation Administration (FAA), industry partners and regional stakeholders, Indonesia highlights practical approaches to enhancing training accessibility, institutional capability, knowledge sharing and workforce readiness. The paper also shares lessons learned regarding the use of digital and blended learning methodologies, including considerations related to accessibility, assessment integrity, cybersecurity and training effectiveness. Indonesia's experience may serve as useful reference material for States/Administrations and support ongoing initiatives under the Asia-Pacific Regional Training Cooperation Framework (RTCF), ICAO's Global Aviation Training Programme, Assembly Resolution A42-24 on NGAP Global Aviation Talent Development, and Assembly Resolution A42-25 on Innovation.

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## 1. INTRODUCTION

1.1 The aviation sector is undergoing significant transformation driven by digitalization, automation, artificial intelligence, advanced air mobility and increasingly data-driven aviation systems. These developments are reshaping aviation operations and creating new competency requirements across technical disciplines. As aviation technologies continue to evolve, the development and maintenance of a competent workforce remain essential enablers of safe, secure, sustainable and efficient aviation.

1.2 While many Member States are actively embracing digital transformation and emerging aviation technologies, the pace of capacity development across the Asia-Pacific region remains uneven. This challenge is reflected in the regional Effective Implementation (EI) score for Critical Element 4 (CE-4) – Technical Personnel Qualification and Training, which stood at 54.98 per cent, below the global average, highlighting the continued need to strengthen technical personnel qualification and training across the region. Differences in access to specialized training, institutional capability, digital learning infrastructure, and international cooperation continue to create disparities in workforce readiness, particularly among developing States and Pacific Small Island Developing States (PSIDS). As aviation systems become increasingly interconnected, these disparities present a common regional challenge that requires greater collaboration beyond national boundaries.

1.3 These evolving challenges demonstrate that preparing the next generation aviation workforce requires a broader and more integrated approach to capacity building. Beyond expanding access to training, Member States need sustainable mechanisms that strengthen institutional capability, promote knowledge sharing, accelerate the adoption of digital learning, and foster long-term regional cooperation. Building such an ecosystem is essential to ensuring that aviation professionals across the Asia-Pacific region are equipped with the competencies needed to safely adopt emerging technologies and support resilient, future-oriented aviation systems.

1.4 Indonesia has pursued an integrated approach to aviation workforce development through strategic partnerships, smart-learning methodologies and regional cooperation initiatives. These activities have supported capacity development, strengthened institutional capability and expanded learning opportunities for aviation professionals.

1.5 Indonesia's experience is presented to support the existing Asia-Pacific Regional Training Cooperation Framework (RTCF) and the Regional Training Programme developed from the regional Training Needs Analysis. The practices described in this paper may assist States/Administrations and the RTCF Working Group in considering accessible training delivery, practical learning, assessment integrity, cybersecurity, learner-data protection and evaluation of training effectiveness within existing regional arrangements.

## 2. DISCUSSION

### 2.1 Strategic Partnerships as the Foundation of Regional Capacity Building

Preparing a future-ready aviation workforce increasingly requires collaboration among governments, international organizations, industry partners and training institutions. Strategic partnerships can support access to expertise, specialized instructors, learning resources, fellowships, on-the-job training opportunities, digital content and institutional-development support.

Indonesia has adopted this collaborative approach by establishing long-term partnerships with international organizations, civil aviation authorities, industry partners, and training institutions. These partnerships have supported the development of competency-based training programmes, strengthened institutional capability, facilitated the exchange of expertise, and expanded opportunities for regional collaboration. Rather than serving as standalone initiatives, these partnerships form the foundation of Indonesia's integrated regional learning ecosystem for developing a future-ready aviation workforce.

Through partnerships with organizations such as ICAO, The Federal Aviation Administration (FAA), Boeing Company, Airports Council International (ACI), the International Air Transport Association (IATA), and other regional aviation stakeholders. Indonesia continues to strengthen aviation training quality by supporting instructor development, course modernization, technical cooperation, fellowship programmes and regional knowledge exchange. These collaborations have expanded regional learning opportunities and demonstrate how strategic partnerships can contribute to sustainable regional capacity building while supporting the harmonization of aviation competencies across the Asia-Pacific region.

### 2.2 Smart Learning for Competency Development

As aviation technologies continue to evolve, training methodologies must also adapt to support changing competency requirements. Indonesia has progressively introduced smart-learning approaches through competency-based methodologies, digital-learning platforms, blended-learning solutions and the exploration of immersive technologies such as augmented and virtual reality.

Smart learning may include online, blended, simulation-based and immersive learning methods selected according to the competency being developed and the relevant operational context. These approaches are intended to complement practical and workplace learning where required and to improve accessibility, flexibility and scalability of training delivery.

Indonesia's experience has highlighted the importance of maintaining appropriate safeguards when implementing smart-learning solutions. These include ensuring instructor readiness, reliable assessment processes, practical skill transfer, accessibility for low-bandwidth environments, protection of learner data, cybersecurity controls, appropriate human oversight of digital tools and evaluation of training effectiveness. Such measures help ensure that technology enhances access to learning without compromising training quality.

2.3 Regional Collaboration for Sustainable Aviation Workforce Development

Sustainable aviation capacity building requires more than individual institutional efforts. It depends on continuous regional collaboration that enables Member States to share expertise, exchange best practices, and collectively strengthen aviation competencies. Such collaboration is particularly important in supporting developing States and Pacific Small Island Developing States (PSIDS), where access to specialized training and technical expertise may remain limited. By working together, Member States can foster a more resilient and harmonized aviation workforce across the Asia-Pacific region.

Indonesia actively contributes to regional capacity-building through fellowship programmes, technical cooperation initiatives, and participation in regional platforms that promote knowledge sharing and competency development. As an active member of the ICAO Regional Training Cooperation Framework Working Group (RTCF-WG) and the ICAO Steering Committee, Indonesia supports collaborative initiatives aimed at strengthening regional training quality, expanding access to aviation learning opportunities, and advancing the implementation of ICAO's Global Aviation Training Strategy and the Next Generation of Aviation Professionals (NGAP) initiative.

Indonesia's experience demonstrates that collaborative approaches can help strengthen regional aviation capacity while supporting the objectives of ICAO's Global Aviation Training Programme, Assembly Resolution A42-24 on NGAP Global Aviation Talent Development, and Assembly Resolution A42-25 on Innovation.

## 3. CONCLUSION

3.1 Indonesia's experience demonstrates that strategic partnerships, smart-learning approaches and regional cooperation can contribute to strengthening aviation workforce development and supporting capacity-building efforts in a rapidly evolving technological environment.

3.2 The initiatives described in this paper provide examples of practical approaches that may assist States/Administrations in enhancing training accessibility, institutional capability, knowledge sharing and workforce readiness for emerging aviation technologies.

3.3 The lessons learned may serve as useful reference material for States/Administrations and support ongoing initiatives under the Asia-Pacific Regional Training Cooperation Framework (RTCF) and related ICAO capacity-development programmes.

## 4. ACTION BY THE CONFERENCE

4.1 The Conference is invited to note the information contained in this paper.

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