

**61ST CONFERENCE OF
DIRECTORS GENERAL OF CIVIL AVIATION
ASIA AND PACIFIC REGION**

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AGENDA ITEM 3: AVIATION SAFETY

**HARNESSING ARTIFICIAL INTELLIGENCE FOR AVIATION
SAFETY: FORMATION OF A REGIONAL COMMUNITY OF
PRACTICE**

(Presented by Singapore, Co-sponsored by Malaysia)

SUMMARY

This paper proposes establishing a Regional Community of Practice (CoP) to enable States/Administrations to share best practices, use cases, and common implementation challenges in adopting artificial intelligence (AI) for safety regulatory applications.

HARNESSING ARTIFICIAL INTELLIGENCE FOR AVIATION SAFETY: FORMATION OF A REGIONAL COMMUNITY OF PRACTICE

1. INTRODUCTION

1.1 States/Administrations are increasingly using digital tools and emerging technologies to support safety risk identification, analysis and oversight. These include Artificial Intelligence (AI)-enabled safety data processing, risk-based oversight tools, and digital platforms supporting State Safety Programmes (SSPs).

1.2 Discussions at recent regional forums, such as Discussion Paper/04 on AI Risk-Based Oversight Initiatives, presented by Indonesia at the 23rd COSCAP-SEA Steering Committee Meeting, indicate growing interest in leveraging such technologies to strengthen safety outcomes, alongside common implementation challenges including data governance, capability constraints, integration with SSPs, and maintaining appropriate human oversight.

1.3 The potential of AI extends beyond incremental improvement. It holds significant promise to fundamentally transform States/Administrations' approach towards safety regulation. Resource-intensive manual processes such as safety data cleaning and analysis, interpretation of standards and guidance material, and the design of effective oversight programmes can be performed more effectively with AI-enabled tools. This allows safety oversight officers to direct their expertise and attention to areas of greatest safety significance. With the Asia-Pacific region forecasted to grow by nearly three times over the next 20 years, AI offers the potential for States/Administrations to sustain regulatory capacity and high safety oversight standards, while remaining dynamic and responsive to industry innovation.

1.4 The safe adoption of AI may be guided by four broad principles. First, any adoption should demonstrate equivalent or improved safety outcomes, with the level of oversight calibrated to the safety significance of the application. Second, clear human responsibility for safety-related decisions should be preserved, regardless of the degree of automation involved. Third, risks should be identified and managed not just at the point of deployment, but across the full arc of design, operation, and change. Fourth, technologies should be introduced incrementally, with operational validation and existing safety practices providing the foundation for each step forward. These principles reflect that the core tenets of safety management remain as relevant as ever. Globally, the aviation community is moving in this direction, though guidance and applicability remain at an early stage. In this context, there is value in establishing a regional forum focused on implementation experience, enabling States/Administrations to learn from one another and work towards developing a shared set of best practices to guide safe and effective AI adoption.

2. DISCUSSION

Rationale for a regional community of practice (CoP) on AI for safety regulation

2.1 The pace of technological advancement creates uncertainty for both regulators and industry, presenting distinct and cross-cutting implementation challenges, including:

- Data governance, including availability, quality, protection and ethical use;
- Human oversight, transparency and interpretability of AI-supported tools; and
- Capability and resource constraints, including gaps in implementation guidance.

2.2 Experience shared by States/Administrations, including initiatives on AI-enabled risk-based oversight and enhanced safety data analytics, suggests that these challenges are common and may be addressed more effectively through mutual learning and sharing of knowledge and best practices.

Objectives and Scope

2.3 The proposed CoP on AI for Safety Regulation would:

- Facilitate the sharing of best practices, lessons learned and implementation experiences by States/Administrations and;
- Exchange knowledge on practical considerations, including governance, data management, and integration into SSPs;
- Explore how AI can enhance the effectiveness and efficiency of safety oversight, including through the automation of data-intensive processes, to help States/Administrations manage growing oversight demands; and
- Identify common challenges and opportunities for collaboration, and provide inputs to existing regional safety mechanisms, where appropriate.

2.4 The CoP on AI will draw on practical implementation experience, with its work encompassing AI-enabled safety data processing and analysis, risk-based oversight supported by advanced analytics, the integration of multiple safety data sources and digital platforms, and how human factors, governance, and trust will shape the responsible adoption of AI. It will also explore how AI can support the aviation community in transforming manual, resource-intensive oversight processes, including data management, standards interpretation, and oversight planning, to enable safety oversight officers to focus on higher-value activities and sustain effective oversight in the context of significant regional growth.

2.5 The CoP on AI may also share approaches on how existing Safety Management System (SMS) principles, including risk management, performance monitoring, and change management, can be applied to AI.

Modality

2.6 Participation in the CoP on AI would be open to interested States/Administrations on a voluntary basis, including the sharing of case studies, pilot projects, and lessons learned, subject to confidentiality, data protection, and proprietary information requirements. Industry partners, experts and international organisations may be invited to contribute technical insights and non-proprietary best practices.

3. ACTION BY THE CONFERENCE

3.1 The Conference is invited to:

- a) note the information provided in this paper;
- b) support the formation of a Regional Community of Practice on AI for Safety Regulation and the submission of this proposal to RASG-APAC for its consideration, with a view to harnessing AI to enhance the effectiveness and efficiency of safety oversight across the region; and
- c) encourage interested States/Administrations to join Singapore and the States/Administrations co-sponsoring this paper in the Regional Community of Practice on AI for Safety Regulation, to share implementation experience, tools and lessons learned.

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