

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

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AGENDA ITEM 3: AVIATION SAFETY

**TOWARDS ARTIFICIAL INTELLIGENCE (AI) - SUPPORTED
SAFETY INTELLIGENCE: MALAYSIA'S EXPERIENCE AND
PROPOSAL FOR A REGIONAL COLLABORATIVE
FRAMEWORK**

(Presented by Malaysia)

SUMMARY

Amendment 2 to Annex 19 — Safety Management and the accompanying Safety Intelligence Manual (Doc 10159) establish safety intelligence as a strategic priority for Member States. Malaysia has been piloting the application of artificial intelligence (AI) techniques — including AI-assisted occurrence classification and predictive analytics — for integration with the Civil Aviation Authority of Malaysia (CAAM) Aviation Reporting System (CAREs), its national safety data collection and processing system, to support the transition from reactive to predictive safety intelligence. This paper shares Malaysia's experience and proposes that the Regional Aviation Safety Group – Asia and Pacific (RASG-APAC) establish a regional collaborative framework to accelerate the responsible adoption of AI-driven safety intelligence across the Asia-Pacific region.

TOWARDS ARTIFICIAL INTELLIGENCE (AI) - SUPPORTED SAFETY INTELLIGENCE: MALAYSIA'S EXPERIENCE AND PROPOSAL FOR A REGIONAL COLLABORATIVE FRAMEWORK

1. INTRODUCTION

1.1 Amendment 2 to Annex 19 — Safety Management, adopted by the ICAO Council on 23 June 2025 and applicable from 26 November 2026, marks a shift from compliance-based to performance- and intelligence-based safety management, introducing for the first-time formal provisions on safety intelligence. The accompanying Safety Intelligence Manual (Doc 10159), First Edition, 2025, provides guidance on the collection, processing, analysis and application of safety data to develop safety intelligence.

1.2 The DGCA/61 Conference theme, “Smart Skies: Emerging Technologies for Safe, Secure, Sustainable and Efficient Aviation,” recognises artificial intelligence (AI) and data analytics as transformative enablers of aviation safety. Most States in the region, however, do not yet have access to aviation-specific AI models or the training data needed to operationalise safety intelligence at scale.

1.3 Malaysia first informed RASG-APAC in 2023 of the digitalisation of its national occurrence reporting through the CAAM Aviation Reporting System (CAREs), including an intention to incorporate machine learning and AI in future development stages (RASG-APAC/13–WP/25 refers). This paper reports on Malaysia's progress since then and proposes a framework for regional collaboration to accelerate AI-supported safety management across the Asia-Pacific region.

2. DISCUSSION

2.1 Malaysia's Experience: Piloting AI-Supported Safety Intelligence

2.1.1 CAREs is Malaysia's national Safety Data Collection and Processing System (SDCPS) under its State Safety Programme (SSP), established in accordance with the Civil Aviation Regulations 2016 (CAR 2016) and Civil Aviation Directive (CAD) 1900. Launched in March 2023 as an online replacement for manual, paper-based reporting, CAREs collects Mandatory Occurrence Reports (MOR) and Voluntary Reports (VOR) from airlines, airports, maintenance organisations and air traffic service providers, and has been associated with a 400% increase in voluntary reporting since its introduction (RASG-APAC/13–WP/25 refers).

2.1.2 Building on this foundation, Malaysia has been piloting the application of AI-assisted occurrence classification and predictive analytics techniques for integration with CAREs, aimed at supporting earlier identification of emerging safety trends ahead of accidents or serious incidents. This work is at an early stage of development and is expected to mature progressively as part of Malaysia's broader SSP roadmap.

2.1.3 Malaysia's experience suggests that predictive analytics, data governance and the cross-border sharing of safety intelligence remain areas of active development for many States in the region — challenges that are well suited to a coordinated regional response.

2.2 Regional Context

2.2.1 Malaysia is already a participating State in the Regional Aviation Safety Data and Information Sharing Initiative, established under a Memorandum of Understanding signed by Indonesia, Malaysia, the Philippines, Singapore and Thailand on the margins of the 59th DGCA Conference in Cebu, Philippines, on 16 October 2024. Under this arrangement — a first of its kind in the Asia-Pacific — the five States share de-identified safety data and information across an initial seven categories of safety occurrence, with the Civil Aviation Authority of Thailand serving as Data Custodian and the Civil Aviation Authority of Singapore as Data Analyst. This initiative demonstrates that structured, governed regional data sharing is both feasible and already operating in the region and

offers a governance model — defined Data Contributor, Custodian and Analyst roles, and agreed data-protection principles aligned with Annex 19 — on which a broader, AI-supported regional safety intelligence framework could build.

2.2.2 Interest in the application of AI to aviation safety is also growing across the region more broadly. Related initiatives have previously been presented to RASG-APAC, including on unmanned aviation and artificial intelligence technologies and on promoting innovative use of technology (RASG-APAC/14-WP/16 and WP/17 refer), and the DGCA Conference has previously considered papers addressing digitalisation, automation and big data in the regional context (DGCA 59/DP/4/8 refers). Malaysia's proposal builds on this trajectory of regional engagement.

2.2.3 Doc 10159 (Chapter 8) encourages States to share and exchange safety information and safety intelligence. A regional framework would give practical effect to this guidance within the Asia-Pacific context and is consistent with GASP 2026–2028 Goal 4 (strengthening collaboration at the regional and national levels) and Goal 6 (expanding safety data-sharing programmes).

2.3 **Rationale for Regional Collaboration**

2.3.1 The predictive value of safety intelligence increases with the volume and diversity of underlying data. A single State's occurrence data, however comprehensive, represents a limited sample of the regional safety landscape. A framework enabling States to share safety intelligence — de-identified insights, model training approaches and validated taxonomies, rather than raw occurrence data — would strengthen the predictive capability available to all participating States.

2.3.2 The Asia-Pacific region's diversity of regulatory environments and safety oversight capability, together with emerging risks such as Global Navigation Satellite System (GNSS) radio frequency interference (RFI) and unmanned aircraft incursions, would benefit from a coordinated, AI-informed approach to safety intelligence.

2.4 **Proposed Regional Collaborative Framework**

2.4.1 Malaysia proposes that RASG-APAC consider establishing a Study Group on Artificial Intelligence for Aviation Safety (AI-SG), working in coordination with the existing Regional Data Sharing Initiative and its participating States, with terms of reference to:

- a) develop a regional framework for AI-supported safety intelligence, building on Doc 10159;
- b) explore the application of AI-assisted analytical techniques to data shared under the existing Regional Aviation Safety Data and Information Sharing Initiative, in coordination with its Data Custodian and Data Analyst;
- c) facilitate the exchange of best practices, de-identified training data and model validation methodologies among interested States;
- d) work toward common standards for AI-assisted occurrence classification to support interoperability across State SDCPS; and
- e) report periodically to RASG-APAC and, as appropriate, to the DGCA Conference.

2.4.2 In support of this initiative, Malaysia offers to:

- a) share lessons learned from its early experience in piloting AI-assisted safety intelligence techniques; and

- b) host a technical workshop on AI for aviation safety on the margins of a future RASG-APAC or APRAST meeting.

3. ACTION BY THE CONFERENCE

3.1 The Conference is invited to:

- a) note Malaysia's experience in piloting AI-assisted safety intelligence techniques and its participation in the Regional Aviation Safety Data and Information Sharing Initiative;
- b) encourage States to explore AI-supported safety intelligence approaches consistent with Doc 10159, taking into account each State's data governance and safety oversight maturity; and
- c) invite RASG-APAC to consider establishing a Study Group on Artificial Intelligence for Aviation Safety (AI-SG), with Malaysia offering to contribute to its initial work programme.

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