International Civil Aviation Organization
Asia and Pacific Office

Twenty-fourth Meeting of the Asia Pacific Regional Aviation Safety Team (APRAST/24)

(Bangkok, Thailand, 01 to 05 December 2025)

Agenda Item 5: **Presentations – State / Industry / ICAO**

DEVELOPMENT OF A REGIONAL APPROACH FOR STATE SAFETY DATA COLLECTION AND PROCESSING SYSTEMS (SDCPS)

(Presented by Pakistan)

SUMMARY

This paper proposes a standardized regional strategy to help APAC States develop and strengthen their State Safety Data Collection and Processing Systems (SDCPS) in line with ICAO Annex 19, Doc 10159 and the objectives of GASP and AP-RASP 2026–2028. It outlines the essential SDCPS components, mechanisms for collecting and managing safety data, and the benefits of integrated safety intelligence, improved performance monitoring and stronger risk-based oversight.

The paper also recommends a phased implementation approach, regional monitoring by the ICAO APAC Office and structured support sessions to help States meet Regional Goal 3 and related GASP/AP-RASP targets. The aim is to consolidate all critical safety data into a single integrated State database that supports SSP implementation and strengthens safety decision-making across all aviation domains.

1. INTRODUCTION

1.1. GASP and AP-RASP 2026–2028 Regional Goal 3 requires all States to assess SSP implementation by 2026 and establish fully functioning SSPs and SDCPS by 2028. A robust SDCPS is central to this goal and is required under ICAO Annex 19 and supported by Doc 10159, which define it as an integrated system for collecting, processing and analyzing safety data from both reactive and proactive sources, supported by structured databases, analytical tools and data-output capabilities.

1.2. Many APAC States, however, lack the technical capacity, standardization and integrated systems needed to meet these requirements. Safety data in several States remains fragmented across paper-based reports, emails, spreadsheets and unconnected databases, limiting the ability to generate safety intelligence, monitor safety performance or implement risk-based oversight. This capability gap threatens regional progress toward AP-RASP Regional Goal 3 and GASP/AP-RASP Goal 2 (Target 2.4) on establishing independent AIAs supported by strong reporting and investigation databases.

1.3. To address these challenges, this Working Paper proposes a standardized regional approach for SDCPS development and implementation. It outlines essential system components, data-collection mechanisms, a phased implementation strategy and a regional monitoring and support framework led by the ICAO APAC Regional Office to help States meet GASP and AP-RASP objectives in a consistent and timely manner.

2. DISCUSSION

2.1. Proposed minimum contents of a state SDCPS

It is proposed that every APAC State SDCPS should, at a minimum, include the following key content areas and modules:

2.1.1. **State MOR System:** A module capturing all mandatory occurrence reports required under relevant ICAO Annexes, fully integrated into the SDCPS.

2.1.2. **State VOR System:** A module for voluntary safety reporting with strong confidentiality and protection measures for reporters and sensitive information.

2.1.3. **Accident and Incident Database:** A centralized repository for accidents, serious incidents and incidents, including investigation records, designed to interface with ADREP/ECCAIRS.

2.1.4. **Regulatory Oversight Audit Modules:** Standardized online platforms for all regulatory areas to plan inspections, record audits and surveillance findings, and apply consistent checklists, classifications and risk assessments.

2.1.5. **FDM Data Collection Interface:** A secure mechanism for operators to submit de-identified FDM data based on State-defined parameters, enabling proactive safety analysis.

2.1.6. **Safety Assessments and Surveys Module:** A module for service providers to upload safety assessments, risk assessments and surveys for State review and integration into risk management processes.

2.1.7. **Taxonomy and Coding Engine:** A system using standardized international codes (e.g., ADREP/CICTT, ICAO codes) to ensure consistent and globally compatible data classification.

2.1.8. **Centralized State Safety Database:** A unified, logically integrated safety database housing all SDCPS modules and enabling consolidated data storage, processing and analysis.

2.1.9. **Analysis and Safety Intelligence Layer:** Tools that support descriptive, diagnostic and predictive analysis, SPI monitoring, hazard identification and evidence-based decision-making.

2.1.10. **Dashboards and Reports:** Graphical dashboards, charts, tables and reports tailored to regulators, decision-makers and service providers, showing safety performance and risk trends.

2.1.11. **Governance and Data Protection Module:** Policies and mechanisms ensuring proper access control, confidentiality, legal protections and secure handling of de-identified safety information.

2.2. Why strong regional support is necessary

2.2.1. Many APAC States have limited capacity in safety data management, system design and advanced analytics. Fragmented and manual systems make it difficult to implement integrated SDCPS solutions or align with global taxonomies. Without coordinated regional guidance, States risk adopting incompatible approaches, slowing progress and weakening regional safety intelligence and ultimately hindering the achievement of AP RASP Goal 3. A harmonized regional model will:

a) ensure consistent interpretation of ICAO provisions;

b) provide common minimum capabilities for all States;

c) support predictive and risk-based oversight;

d) enhance readiness for future ICAO and partner assessments.

2.2.2. Regional guidance is essential to achieve AP-RASP Regional Goal 3 and related GASP objectives within the 2026–2028 timeframe.

2.3. **Phased implementation of SDCPS by states**

To ensure realistic and structured progress, the following four-phase model is proposed for States:

2.3.1. **Phase 1: National Planning and Gap Analysis (0–6 months)**

States review Annex 19 and Doc 10159 requirements, assess existing safety data systems, identify gaps against the minimum SDCPS elements, define national functional and technical needs, and develop an implementation plan.

Outputs: Gap analysis report, high-level SDCPS architecture, and an approved national roadmap.

2.3.2. **Phase 2: Development of Core Modules (6–24 months)**

States design or procure core SDCPS modules—including SMOR, SVOR, accident/incident and investigation modules, regulatory oversight modules, FDM interfaces, and safety assessment tools—along with taxonomy engines, central databases and data pipelines.

Outputs: Prototype SDCPS modules, configured taxonomies, and initial system integration.

2.3.3. **Phase 3: Integration, Testing and Adoption (24–30 months)**

All modules are integrated into a single SDCPS, followed by system testing, data-quality validation, establishment of data-protection measures, user training and formal adoption as the State's primary safety data platform.

Outputs: Fully integrated and tested SDCPS, trained users, operational governance arrangements and formal SSP/oversight integration.

2.3.4. **Phase 4: Full Operationalization and Maturity (30–36 months)**

States achieve full operational use of the SDCPS, implement advanced analytical and predictive capabilities, enhance dashboards, and continuously improve data quality and taxonomies while evaluating system effectiveness.

Outputs: Mature SDCPS delivering comprehensive safety intelligence, supporting SPIs and risk-based oversight, and generating good practices for regional sharing.

2.4. **Bi-Annual SDCPS Progress Reviews**

To support and oversee the phased implementation by States, the ICAO APAC Regional Office (or a designated volunteer State or expert group) should establish a Regional SDCPS Monitoring Framework, operating in coordination with APRAST meetings and related activities. This framework should:

a) monitor and record States' progress against the four implementation phases described in Section 2.4;

b) identify States requiring targeted technical or capacity-building assistance;

c) conduct, upon request and based on needs assessments, SDCPS-focused technical missions to review national SDCPS designs, evaluate data quality and integration, and provide guidance on governance, data protection and analytics; and

d) publish a bi-annual regional report summarizing overall progress, common challenges, examples of good practices and recommendations for further regional action.

2.5. **Role of ICAO APAC regional office and regional support sessions:**

2.5.1. Doc 10159 highlights the importance of regional collaboration, sharing and exchange of safety data and safety intelligence, and the role of regional safety groups in supporting States. It is proposed that ICAO APAC RO conduct a series of regional SDCPS implementation support sessions. These sessions would help ensure that States are working according to a common plan, progressing through the same stages, and building systems that are compatible, interoperable and aligned with ICAO provisions and AP-RASP Regional Goal 3.

3. ACTION BY THE MEETING

3.1 The Meeting is invited to:

a) Endorse the proposed minimum SDCPS content, data-collection mechanisms and phased implementation strategy, and encourage States to conduct gap analyses and develop national SDCPS plans accordingly.

b) Request ICAO APAC Regional Office to establish a regional SDCPS monitoring framework, including annual reviews, technical missions, and to deliver a structured programme of SDCPS implementation support sessions.

c) Encourage APAC States to actively participate in regional activities, share experience and best practices, and support the integration of SDCPS-related indicators into AP-RASP monitoring to strengthen regional progress and risk-based oversight.

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