60th CONFERENCE OF DIRECTORS GENERAL OF CIVIL AVIATION ASIA AND PACIFIC REGIONS

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AGENDA ITEM 3: AVIATION SAFETY

SHARING SAFETY DATA ACROSS APAC STATES: A FRAMEWORK FOR EFFECTIVE DATA EXCHANGE

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SUMMARY

This paper highlights the need to strengthen aviation safety data sharing among APAC States to enhance regional safety oversight. It proposes a regional centralized, structured system for collecting, processing, and sharing safety data while ensuring confidentiality and promoting safety improvements. The paper outlines current challenges in implementing Safety Data Collection and Processing Systems (SDCPS) in line with ICAO Annex 19 and Doc 9859. It recommends developing a unified APAC Safety Data-Sharing System—a standardized, user-friendly platform to align SPIs, SPTs, and State safety management efforts. Though voluntary, the system's effectiveness is expected to encourage broad participation and support regional ICAO compliance.

SHARING SAFETY DATA ACROSS APAC STATES: A FRAMEWORK FOR EFFECTIVE DATA EXCHANGE

1. INTRODUCTION

1.1 Many APAC States continue to work toward strengthening their aviation safety data systems; however, challenges such as varying data collection methods and limited interoperability of Safety Data Collection and Processing Systems (SDCPS) can make it difficult to effectively identify regional safety trends. These limitations may also affect the timely and consistent sharing of valuable safety information among States and with the ICAO regional office, particularly in support of the Safety Promotion component of the State Safety Programme (SSP). While the APAC Regional Aviation Safety Plan highlights the importance of structured data sharing, not all States currently have the necessary resources, infrastructure, or specialized expertise to fully implement and maintain advanced data systems. Additionally, managing Safety Performance Indicators, Safety Performance Targets, and Safety Performance Management Systems can be a complex process that requires sustained support.

1.2 To support APAC States in overcoming these challenges, this paper proposes the development of a Centralized APAC Safety Data-Sharing System. Designed as a user-friendly and standardized platform, the system would help simplify data collection and processing while promoting harmonized integration across the region using ICAO-compliant taxonomies such as ADREP and ECCAIRS 2. It would also enable the production of de-identified safety trend reports, encouraging collaboration and informed decision-making. Participation in this initiative would be entirely voluntary, and the system's practical benefits—such as enhanced regional oversight and support for ICAO compliance—are expected to gradually attract wider engagement from States over time.

2. DISCUSSION

Importance of Data Sharing

2.1 Accurate and timely safety data is essential for predictive risk management, allowing aviation authorities to proactively identify and address emerging safety risks. Establishing a structured, non-punitive data-sharing framework supports the principles of Just Culture by encouraging voluntary safety reporting without fear of retribution, thereby improving both the quality and volume of available safety data. Aligned with ICAO's Safety Management System (SMS) principles, the sharing of de-identified safety data among States and industry stakeholders is a key enabler of evidence-based decision-making and continuous safety improvement.

Proposed Mechanism for Data Sharing

2.2 **Selection of Priority Safety Events for Data Sharing:**

As the first step, it is proposed that APAC States work collaboratively to identify and agree on key types of aviation safety data most useful for regional risk analysis and safety improvement, in alignment with ICAO guidance, particularly the ADREP Taxonomy Document. A dedicated team or committee may be formulated to lead this effort, facilitating mutual consultation and consensus-building. This group may help determine priority data categories—such as occurrence reports, safety performance indicators, and de-identified operational data—and decide which specific events fall under each category. Such coordination will promote consistency, relevance, and mutual trust, forming a strong foundation for an effective regional data-sharing framework.

2.3 **Centralized web-based APAC Safety Data-collection / Sharing System:**

1) **Core Structure and Components:** The system will be designed as a multi-layered, cloud-based platform with a secure interface for States to submit, store, process, and retrieve safety data.

2) **Modular Architecture:** The system will consist of interconnected functional modules, including:

a) **Occurrence Reporting and Investigation Module:** this module will enable real-time reporting, classification, and investigation of safety occurrences. It shall provide standardized interfaces for submitting the data of events as determined by the collaborative team established for this purpose.

b) **Safety Performance Indicator (SPI) and Target (SPT) Module:** This module will assist the APAC region and the States in defining, tracking, and improving their SPIs and SPTs. The SPIs and SPTs established by the region will be followed by the states. This will help in standardizing the practices across the region, further paving the way for developing the Regional Level and State Level SEIs.

c) **Risk Assessment and Predictive Analytics Module:** This Modules will use manual as well as AI-driven analytics to predict potential safety risks based on data submitted by the states.

d) **Investigation Reports Database:** A repository of de-identified investigation reports shall allow states / stakeholders to access historical cases for lessons learned.

e) **Data Visualization and Dashboard Interface:** This module shall provide real-time graphical representation of safety trends across APAC Regional Office as well as the states.

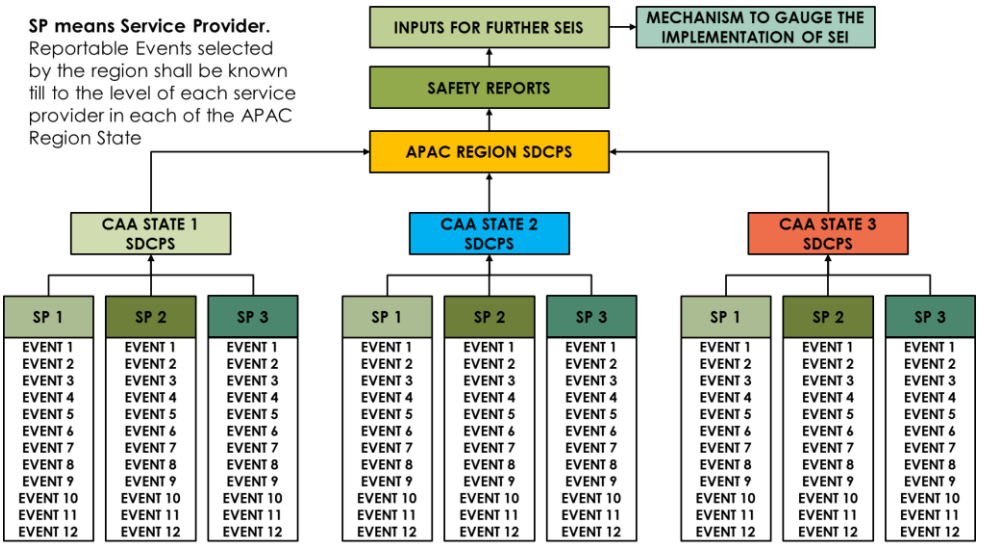
f) **De-identified Safety Summaries:** To ensure confidentiality, state-specific information will be anonymized, generating aggregated safety insights for regional trend analysis.

g) **User Access and Permissions Management:** The system will implement tiered access controls, ensuring that only authorized personnel from each State can access relevant data.

h) **Compliance and ICAO Alignment:** The system may integrate with ICAO's database, ensuring data harmonization and global benchmarking.

2.4 **Conceptual Framework:**

The image below explains the conceptual framework of the regional SDCPS. Once the APAC Region selects a standardized set of reportable safety events, each service provider within the APAC States will submit data on these events through their respective State's SDCPS. The State Civil Aviation Authority will then analyze the submitted data and will forward it to the APAC Regional SDCPS database through the same system. This structured process will ensure a consistent and harmonized flow of safety information from the service provider level to the regional level, enabling effective monitoring, risk analysis, and implementation of Safety Enhancement Initiatives across the region.



Implementation Challenges and Mitigation Strategies

2.5 **Legal and Confidentiality Concerns:** To ensure the success of a regional safety data-sharing initiative, it will be essential to establish a formal *REGIONAL AGREEMENT* that clearly defines the legal, ethical, and procedural safeguards for handling safety data. Such an agreement will help build mutual trust among States and service providers, fostering open communication and reliable reporting across the region. The agreement should address the following key aspects:

1) **Data Integrity:** Measures will be put in place to prevent unauthorized alteration, misuse, or loss of submitted data. This includes secure data transmission protocols, data encryption, and controlled access systems.

2) **Non-Punitive Use Policy:** It is critical to maintain a Just Culture approach by ensuring that the data shared is not used for punitive or disciplinary action. The agreement will emphasize that the objective of data sharing is solely for safety enhancement, learning, and proactive risk mitigation.

3) **De-identification and Anonymity:** Service provider and personnel-specific data will be anonymized to protect individual identities and promote open and voluntary reporting. Only aggregated or de-identified data will be visible at the regional level.

4) **Legal Protections Across Jurisdictions:** The agreement should take into account the legal systems of participating in States and harmonize procedures to avoid conflicts. This may involve developing common data-sharing protocols and confidentiality clauses accepted by all APAC member States.

2.6 **Technology Development and Funding:** The establishment of a robust, cloud-based APAC Safety Data Collection and Processing System (SDCPS) will require significant technical and financial investment. To support this, the following actions are proposed:

1) **Resource Sharing:** APAC States will be encouraged to pool their resources by contributing technical expertise, IT infrastructure, and data management support. States with advanced systems may offer guidance or even host parts of the infrastructure.

2) **Financial Support:** A regional funding mechanism may be established, where States contribute proportionally based on their capacity. Funding can also be sought from international aviation bodies or development partners.

3) **Capacity Building:** Joint efforts will be made to train personnel at both the regional and national levels in using the new system, analyzing data, and maintaining system security and performance.

4) **Collaborative Development:** The technology platform will be developed using modular architecture to allow customization by each State while maintaining interoperability. Multiple options may be considered to reduce costs and promote long-term sustainability**.**

3. ACTION BY THE CONFERENCE

3.1 The Conference is invited to:

a) Endorse the proposal for establishing a Centralized APAC Safety Data-Sharing System.

b) Establish a dedicated task force within RASG-APAC to oversee system design, implementation, and governance.

c) Encourage voluntary contributions from States in the form of technical expertise and funding.

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