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Agenda Item 5: Presentations – State / Industry / ICAO

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

(Presented by Pakistan)

SUMMARY

This paper underscores the critical need for enhanced aviation safety data sharing among Asia-Pacific (APAC) States to strengthen regional safety oversight. It proposes a structured and centralized mechanism for data collection, processing, and exchange, identifying priority safety events and establishing a governance framework to ensure data protection, confidentiality, and effective utilization for safety enhancements. Furthermore, the paper highlights the significant challenges faced by APAC States in developing robust Safety Data Collection and Processing Systems (SDCPS), a mandatory requirement under ICAO Annex 19 and Doc 9859. A key recommendation is the establishment of a centralized APAC Safety Data-Sharing System, which would serve as a user-friendly and standardized platform for aviation safety data management. While participation would remain voluntary, the system's demonstrated effectiveness and ease of use would encourage gradual adoption by States. The proposed initiative would facilitate the harmonization of Safety Performance Indicators (SPIs), Safety Performance Targets (SPTs), and State Safety Performance Management Systems, thereby significantly improving regional safety collaboration and compliance with ICAO standards.

1. INTRODUCTION

1.1. Aviation safety data is a cornerstone for identifying potential hazards, mitigating risks, and preventing accidents. However, many APAC States face fragmented and inconsistent data collection methodologies, which hinder the ability to analyze regional safety trends effectively. Additionally, the absence of well-structured and interoperable SDCPS limits the ability to share meaningful safety data across States and with the ICAO regional office under the 4th Component of the State Safety Programme (SSP) – Safety Promotion.

1.2. The Regional Aviation Safety Plan (AP-RASP) places a strong emphasis on the need for structured and proactive safety data exchange among APAC States. However, many States lack the necessary expertise, resources, and technological infrastructure to develop and maintain effective safety data management systems. Furthermore, the complexities associated with Safety Performance Indicators (SPIs), Safety Performance Targets (SPTs), and State Safety Performance Management Systems further exacerbate these challenges.

1.3. To address these challenges, this paper proposes the establishment of a Centralized APAC Safety Data-Sharing System, which would:

a) Provide a comprehensive, user-friendly, and standardized data collection and processing mechanism, eliminating the need for individual States to develop their own independent systems.

b) Facilitate seamless integration of aviation safety data across APAC States using a common taxonomy aligned with ICAO ADREP and ECCAIRS 2.

c) Enable the generation of de-identified, region-wide safety trend reports, fostering a culture of collaborative risk management.

d) Serve as a voluntary yet highly beneficial platform, where States are encouraged—but not mandated—to participate. The value derived from enhanced safety oversight and streamlined regulatory compliance would naturally drive adoption over time.

2. DISCUSSION

2.1. Importance of Data Sharing

2.1.1. The availability of accurate and timely safety data is fundamental to predictive risk management, enabling aviation authorities to proactively identify and mitigate emerging safety risks.

2.1.2. A structured and non-punitive data-sharing framework fosters Just Culture, encouraging voluntary safety reporting without fear of retribution, thereby enhancing the quality and quantity of safety data.

2.1.3. ICAO's Safety Management System (SMS) principles emphasize the necessity for States and industry stakeholders to share de-identified safety data to drive evidence-based decision-making.

2.2. Proposed Mechanism for Data Sharing

2.2.1. Priority Safety Events for Data Sharing:

To ensure meaningful and targeted data exchange, the following categories of safety occurrences should be prioritized:

a) Runway Incursions and Excursions

b) Controlled Flight into Terrain (CFIT)

c) Loss of Control In-Flight (LOC-I)

d) Airborne Conflicts and Separation Losses

e) Maintenance-Related Safety Events

f) Fatigue and Flight Duty Time Limitations (FDTL)

g) Safety Reports on Unruly Passengers and Security Breaches

h) Ground Handling Incidents and Ramp Safety Issues

i) Bird Strikes and Wildlife Hazard Occurrences

j) Engine Failures and Aircraft System Malfunctions

k) Dangerous Goods Incidents and Non-Compliance

l) Flight Crew and ATC Communication Failures

m) Deficiencies in Aerodrome Infrastructure Affecting Safety

n) Mid-Air Collisions and Near-Misses

o) Security Threats, Dangerous Goods, and Unauthorized Aircraft Interference

p) Any other data as decided by the secretariate

2.2.2. **Centralized APAC Safety Data-Sharing System:**

a) **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.

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

i) **Occurrence Reporting and Investigation Module:** Enables real-time reporting, classification, and investigation of safety occurrences.
ii) **Flight Data Monitoring (FDM) System:** Facilitates structured analysis of operational data to identify emerging risks.
iii) **Mandatory Occurrence Reporting (MOR) System:** Provides a standardized interface for mandatory safety data submission.
iv) **Safety Performance Indicator (SPI) and Target (SPT) Module:** Assists States in defining, tracking, and improving their SPIs and SPTs in alignment with ICAO SSP guidelines.
v) **Risk Assessment and Predictive Analytics Module:** Uses AI-driven analytics to predict potential safety risks based on historical data trends.
vi) **Investigation Reports Database:** A repository of de-identified investigation reports, allowing stakeholders to access historical cases for lessons learned.
vii) **Data Visualization and Dashboard Interface:** Provides real-time graphical representation of safety trends across APAC.
viii) **De-identified Safety Summaries:** To ensure confidentiality, state-specific information will be anonymized, generating aggregated safety insights for regional trend analysis.
ix) **User Access and Permissions Management:** The system will implement tiered access controls, ensuring that only authorized personnel from each State can access relevant data.
x) **Compliance and ICAO Alignment:** The system will integrate with ICAO's database, ensuring data harmonization and global benchmarking.

2.3. **Implementation Challenges and Mitigation Strategies**

2.3.1. **Legal and Confidentiality Concerns:** Establish a regional agreement to safeguard data integrity and uphold non-punitive use policies.

2.3.2. **Technology Development and Funding:** Encourage APAC States to contribute resources, technical expertise, and financial support for system implementation.

3. ACTION BY THE MEETING

3.1. The Meeting 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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