

**57th CONFERENCE OF
DIRECTORS GENERAL OF CIVIL AVIATION
ASIA AND PACIFIC REGIONS**

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AGENDA ITEM 3: AVIATION SAFETY

**DATA COLLECTION, ANALYSIS, INTEGRATION AND
SHARING FOR BETTER TREND MONITORING AND
DECISION MAKING**

Presented by the Islamic Republic of Pakistan

INFORMATION PAPER

SUMMARY

ICAO Annex 19 chapter 5 & DOC 9859 (Safety Management Manual Clause 5.1.5 requires States to establish Safety Data Collection and Processing Systems (SDCPS) to capture, store, aggregate, and enable the state to analyze the safety data /information to support their safety performance activities.

This information paper describes the efforts of Pakistan CAA for establishment of a digital platform to achieve this objective. PCAA SDCPS has eight modules and covers the data collection, storage, retention and analysis of almost all the critical events as defined by ICAO in GASP.

The continuous data collection will enable PCAA for better analyses of critical safety events and ensure Safety oversight of all operators.

DATA COLLECTION, ANALYSIS, INTEGRATION AND SHARING FOR BETTER TREND MONITORING AND DECISION MAKING

1. INTRODUCTION

- 1.1. Pakistan CAA has established SDCPs to fulfil the requirements of ICAO Annex 19 which requires that “States shall establish safety data collection and processing systems (SDCPS) to capture, store, aggregate and enable the analysis of safety data and safety information”
- 1.2. The purpose of SDCPS is to integrate the data generated by various sources on a single platform and create auto generated reports / information for various levels of management, for both Regulatory and Airport & Operations divisions.

2. DISCUSSION

Scope:

- 2.1 The SDCPS initially encompasses the 8 modules as defined in this paper while 4 modules are in concept phase. The objective is to consolidate all the critical information on one-page dashboard where the top management can look into the sensitive matters and the decision may be taken on the basis of analysis. Operators and state can monitor the SPI and SPTs through the alert level.

Sources of Safety Information

- 2.2 SDCPS encompasses all data / information generated through following sources:
 - a) Voluntary Hazard Reporting System
 - b) Wildlife Hazard reports
 - c) Incident / occurrence reports w.r.t. aerodromes / aircrafts.
 - d) Unserviceability of ANS / APS equipment
 - e) Flight movements throughout Pakistan
 - f) SPIs and ALoSP
 - g) Safety Assessments and Reviews
 - h) Flight standard MORs
 - i) Airworthiness MORs
 - j) DAAR Audits
 - k) Flight Standard Audits
 - l) AW Audits
 - m) Licensing Data

SDCPS Dashboard

- 2.3 A dynamic dashboard has been established to integrate the summaries of safety data generated by operational activities of aviation stakeholders at one place. Main dashboard consists of following modules:
 - a) Voluntary Hazard reporting Module
 - b) Wildlife / bird hits reporting Module
 - c) Incidents / occurrence reporting module
 - d) Unserviceability reporting module
 - e) Aircraft movement reporting module

- f) Safety performance module
- g) Flight standards MOR Module
- h) Airworthiness MOR Module

Voluntary Hazard Reporting Module

- 2.4 Voluntary hazard reporting system is a mandatory requirement for implementation of SSP / SMS, as required by ICAO Annex 19 (Clause 5.1.3). This module has been established by automating the existing manual system of hazard reporting.
- 2.5 Any employee of any of the stakeholders working in Aviation Industry may report a hazard through CAA online voluntary hazard reporting system.
- 2.6 The online hazard reporting form is available on CAA website as well as through mobile app downloadable from Google Play Store. Each hazard report shall be assigned a unique auto ID Number by the system for identification and traceability.
- 2.7 The SDCPS shall be able to present various analyses on Dashboard.

Wildlife Reporting Module

- 2.8 Wildlife / bird strikes data is one of the most important data w.r.t. flight safety. Wildlife reporting module shall contain all the reports of animal / bird strikes to the aircraft in Pakistan.
- 2.9 To standardize the Wildlife / bird strikes reporting system, an online mechanism has been developed for collection (reporting), authentication, data management and analysis and reporting.
- 2.10 Airlines will be bound to submit the wildlife hit report within 24 hours. Each airport shall nominate a “wildlife / bird hit portal admin” who will be responsible for verifying the reported bird hit.

Incidents / Occurrence Reporting Module (IOM)

- 2.11 The daily IOU report is the key reporting system which consists of Incidents, Occurrences & Unserviceability relating to the aerodrome facilities, ANS equipment and safety related events concerning aircraft operation.
- 2.12 Incidents and occurrence module (IOM) has been developed to collect and analyze the data by digitizing the existing sources of data reporting i.e. IOU. The main benefit of this module is that all events are being reported through same medium increasing the authenticity of the data
- 2.13 Information of the incidents / occurrences can be collected through this module. All possible events as defined in Annex19, Annex 13 or under the heading of incidents, serious incidents or precursor have been included in this module:

<ul style="list-style-type: none"> • Bird / animal hit* • Air Pocket • Aircraft Crash (On Airport) • Aircraft Crash (Off Airport) • Airspace Violation 	<ul style="list-style-type: none"> • Fuel shortage • Hijacking • Hydraulic Failure • Midair collision • Non-Standard RT • Pressurization Failure 	<ul style="list-style-type: none"> • Smoke in Aircraft • Taxiway Excursion • Taxiway Incursion • TCAS (TA) • TCAS (RA) • Duplication of target
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<ul style="list-style-type: none"> • Belly Landing • Bomb threat • Emergency to Aircraft in Air • Engine on fire • Entry in Restricted Area • Drone / UMV • Unidentified aircraft • FOD • Violation of apron / safety rules *** • Diversion • Fire Incident Non-Aircraft at Airport • Fire Incident Non-Aircraft outside Airport • Go around 	<ul style="list-style-type: none"> • Projectile Fired towards Aircraft • Radio Communication Failure (RCF) • Route violation • Runway Incursion • Runway Excursion • Severe Turbulence Holding • Medical Emergency in air • Occurrence (Misc.) • Runway Blockage • Oil / Fuel Spillage • Technical Problem in Aircraft on Ground 	<ul style="list-style-type: none"> • Vehicle / equipment hits aircraft • Aircraft incident on ground • Emergency decent • Aborted Take Off • Laser Beam • Missed Approach • Target Missed • Vehicle / equipment hits other vehicle / equipment • Vehicle / equipment hits building / infrastructure • Employee Accident During Operations • Flight cancelled
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2.14 Many of these events are clubbed to report the SPIs and ALoSP. Also multilevel reports are generated for consumption of operational level and strategic level decision makers in Pakistan civil aviation authority.

Unserviceability Reporting Module

2.15 The unserviceability reporting module has the capability to keep records of equipment inventory along with their histories of un-service abilities.

2.16 All major and important operational equipment has been included in the Master Data. The whole inventory of operational equipment has been categorized as follows:

Aircraft Stand System	Building Transport System	Radars
Any Other Operational Equipment	Generators / Air Conditioners	Radio Nav Aids
Baggage Handling System	Met Instruments	RFF And Operational Vehicles
Building Management System	Operational Areas	Telecom Channels
	Passenger Boarding Bridges	Visual Aids

2.17 Like the IOM, on receipt of information regarding any unserviceability from the respective reporting sections at airports and locations, concerned Comm. Ops. Office will feed the data in the relevant areas.

Aircraft Movement Reporting Module

2.18 This module fetches live data from Flight Information Revenue Management System (FIRMS) being entered by ATC personnel.

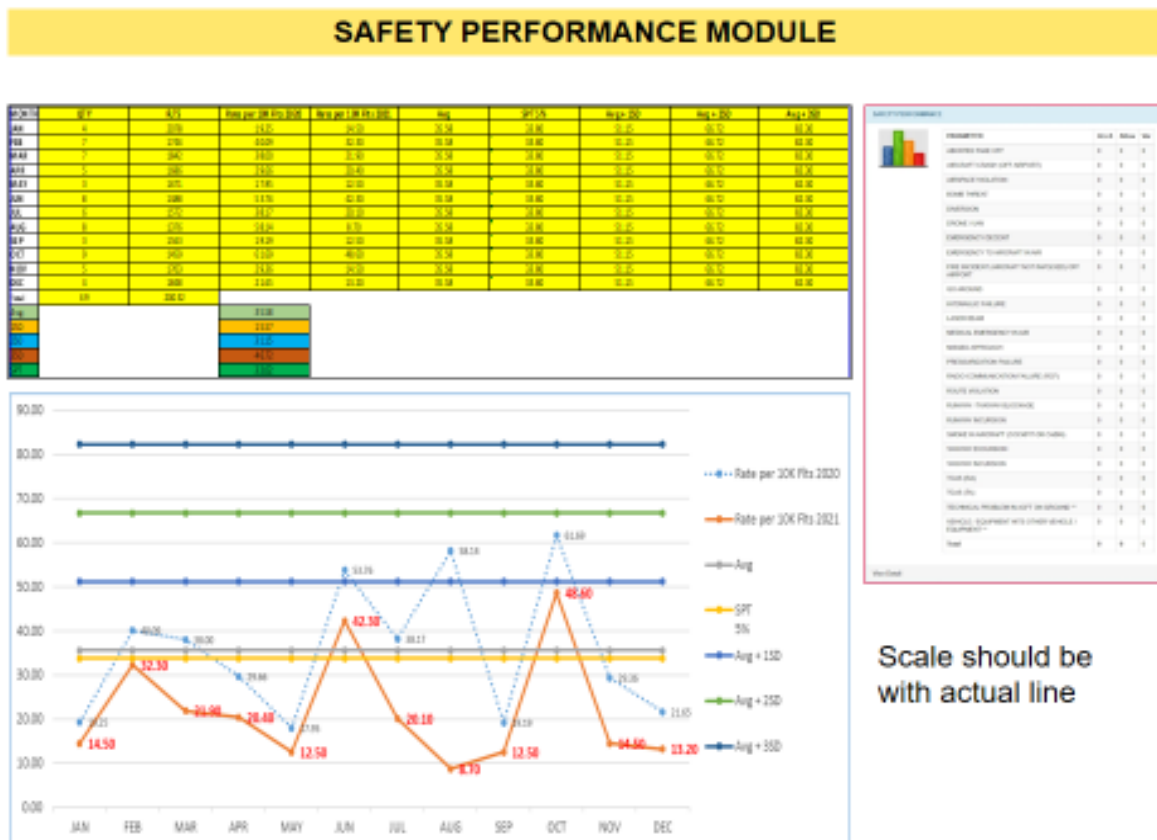
2.19 Flights within Pakistan airspace flights are categorized as Domestic, International, local, training and military. Transit flights are the major chunk of this figure.

Safety Performance Reporting Module

2.20 One of the objectives of instituting SDCPS is to oversee the safety performance of all stakeholders in the aviation industry.

2.21 The state in collaboration with regulatory bodies and Service Providers, has established 9 Key Safety Areas containing 31 SPIs with 47 Safety events. Data for measuring these SPIs is fetched from the occurrence module as well as AW SPIs module. These KSAs, SPIs and Events are stated below:

2.22 SPIs, SPTs and Safety Alerts are being monitored through this module. Safety Alerts shall be generated once the occurrence of safety event breaches the annual average by +1SD / +2SD / +3SD. (SD is standard deviation)



Flight Standards MOR Module

2.23 This module has been established to automate the MOR submission by the operators in Pakistan to Flight Standards Directorate. All airlines are bound to submit the MOR of 15 events selected by FSD within 48 hours of the occurrences. All the operators have been issued secured log in and the data entry mechanism is accessible through CAA website.

2.24 Data of all major operators in Pakistan is since 2020 is available in the database of this module. FSD and state can see the data of all operators but each of the operator can see its own data only.

Airworthiness Management System

- 2.25 Airworthiness Directorate has established its own Airworthiness Management Software to manage all its audits inspections and tasks. This software has the database of aircrafts and related licenses of all Pakistan registered aircrafts.
- 2.26 This software is a standalone system and fulfils the requirements of AW directorate. This software is also considered a part SDCPS.
- 2.27 MOR of AW is well known as CAAF-114 which is a part of the Airworthiness Management System. Airlines operators have been granted protected logins and IDs to enter the mandatory occurrence reports online. As soon as an MOR is submitted by the Operator, it appears on SDCPS dashboard as well.
- 2.28 AW has defined 10 SPIs for operators in the state. Five for maintenance organizations and five for Airworthiness Management setup. The SPIs may be revised w.r.t the trend analysis in the country as well as in the region

Data Security

- 2.29 All users of SDCPS are issued secured logins and IT department has kept backup of the data in multiple layers.

Data Sharing

- 2.30 SDCPS modules have the ability to exor the relevant data to excel as well as PDF formats. The data may be shared with industry stakeholders and other states in region on as and when basis and deemed appropriate by the state authorities.

Data Driven Decision Making

- 2.31 Data from SDCPS as well as standalone modules of SDCPS used by regulatory bodies is used in NAST as well as sit meeting.
- 2.32 Data is also used to create data-based surveillance plans by the regulatory bodies.
- 2.33 The backup of the data is also available with IT branch of PCAA

3. ACTION BY THE CONFERENCE

- 3.1 The Conference is invited to note the information contained in this Paper.

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