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

Sendai, Japan
28 July - 1 August 2025

AGENDA ITEM 3: AVIATION SAFETY

ENHANCING AVIATION SAFETY THROUGH REGIONAL DATA SHARING

(Presented by Indonesia, Malaysia, the Philippines, Singapore, Thailand, co-sponsored by Vietnam)

SUMMARY

Following the establishment of the regional data sharing initiative presented at the 59th DGCA Conference, this paper provides an update on its implementation progress and key developments. The paper outlines the elements that have enabled effective data sharing among participating States, including governance framework, standardisation efforts, and data quality management processes. Analysis of more than 7,000 occurrences has yielded preliminary safety insights, such as patterns in Ground Proximity Warning System (GPWS) alerts across different aircraft types, and refined approaches to data collection for bird strike assessment. The paper demonstrates how regional collaboration in safety data sharing can support both safety trend analysis and improvements in data collection methodologies.

ENHANCING AVIATION SAFETY THROUGH REGIONAL DATA SHARING

1. INTRODUCTION

1.1 At the 59th DGCA Conference, Indonesia, Malaysia, the Philippines, Singapore and Thailand jointly established the first in the region safety data sharing initiative among States to enhance aviation safety. The initiative focuses on sharing and analysing safety occurrence data collected through States' mandatory occurrence reporting systems. The initial list of seven categories of safety occurrences (see below) to be shared were determined based on factors such as the relevance to the high-risk occurrence categories in this region, past occurrence trends and the assessed level of risk by the participating five States.

(i) Traffic Collision Avoidance System – Resolution Advisory (TCAS-RA),
(ii) Deviations from Air Traffic Controller (ATC) assigned altitude,
(iii) Ground Proximity Warning System (GPWS) or Terrain Awareness and Warning System (TAWS),
(iv) Severe turbulence,
(v) Windshear,
(vi) Bird strikes,
(vii) Dangerous goods incidents.

1.2 Since the signing of the Memorandum of Understanding (MOU) in October 2024, a comprehensive Procedural Handbook was developed, detailing implementation processes and data governance and confidentiality protocols. This initiative has made significant progress with more than 7,000 occurrences across the seven agreed categories between January 2023 and February 2025 collected. Participating States have shared data and developed dashboards for the initial batches of safety occurrences.

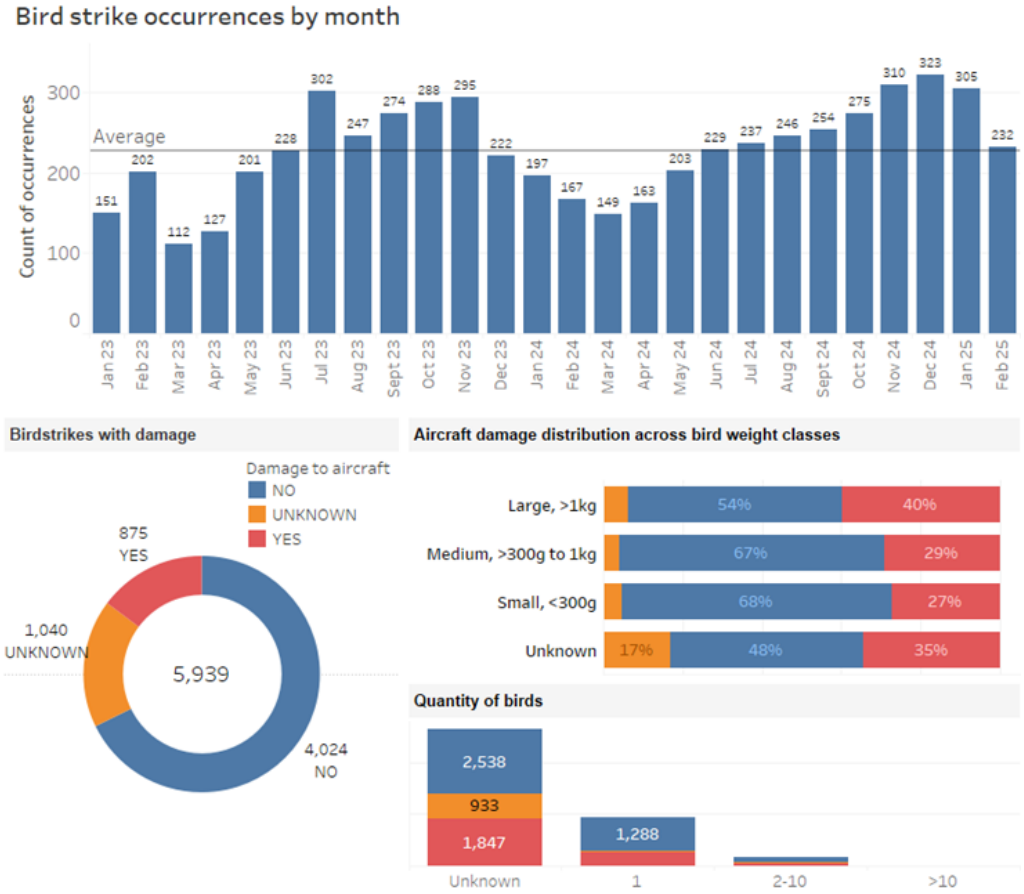
2. DISCUSSION

Initial analysis and insights

2.1 Analysis of the shared occurrences revealed that bird strikes constituted the majority of the occurrences (approximately 5,900). A notable increase in bird strikes was observed towards the year end, confirming seasonal trends in bird movement patterns.

2.2 While bird strikes by larger birds typically result in damage to aircraft (40% of bird strikes by birds weighing more than 1kg), the consolidated data showed that smaller birds have also resulted in aircraft damage in a notable number of occurrences (~27% of all strikes by small birds and ~29% of all strikes by medium birds). This finding has led participating States to enhance their data collection by including additional fields such as bird size categories (by weight), location of damage, and number of birds involved in each strike. The refined data collection will support more comprehensive wildlife hazard assessment and management strategies.

2.3 Beyond the sharing of occurrence data, the participating States also shared qualitative information to raise awareness and derive deeper insights. For example, Singapore shared with the participating States the sighting of large flocks of Asian openbill storks in Singapore, which are typically native to northern Southeast Asia. Given that such large birds could potentially cause significant damage to aircraft, this sharing enabled the participating States to be more vigilant and take proactive measures to keep them away from aerodromes during their northward migration.



**'Unknown' indicate fields where the data was not available or provided at the time of submission.*

Figure 1: Regional data sharing - bird strike dashboard (Jan 2023 – Feb 2025)

2.4 Another area of interest was the analysis of Ground Proximity Warning System (GPWS) alerts as a precursor event to Controlled Flight into Terrain (CFIT). There were more GPWS alerts in the modes 1 to 4 as compared to modes 5 and 6. This meant that there could be higher risks associated with excessive sink rate and closure rate (modes 1-4) as compared to modes 5 and 6, which are typically associated with incorrect landing configuration. From the analysis of aircraft types involved, it was noted that some aircraft models had a higher number of GPWS alerts. Some reasons discussed could be that such aircraft models are typically deployed for non-precision approaches in this region, and could also be installed with older avionics systems. While the current data suggests that airports utilising non-precision approach procedures may experience higher rates of GPWS alerts, particularly those related to sink rate and closure rate (modes 1-4), further analysis would be required to determine whether these aircraft models inherently contribute to the higher alert rates observed.

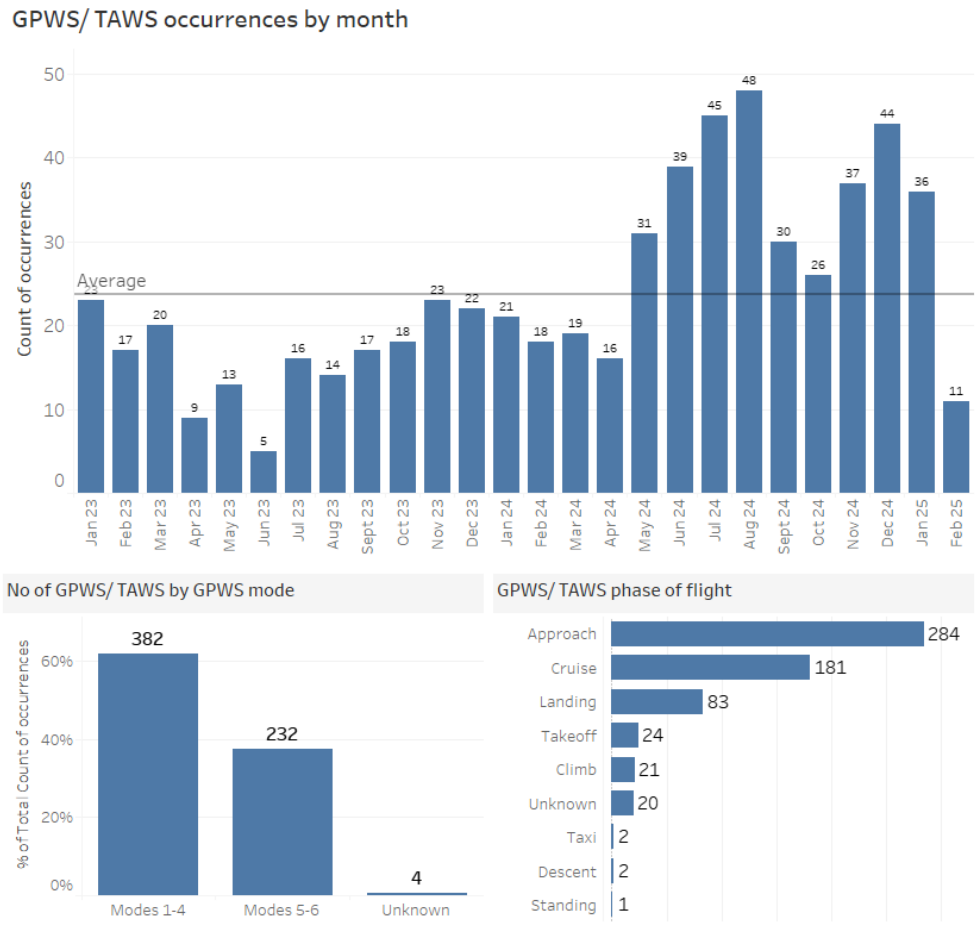


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Figure 2: Regional data sharing - GPWS/ TAWS dashboard (Jan 2023 – Feb 2025)

2.5 The analysis of consolidated data has provided opportunities to examine safety patterns across a wider dataset. The GPWS alert analysis benefited from multiple data sources to understand aircraft and system characteristics, while the bird strike analysis led to refinements in data collection parameters. These examples demonstrate potential areas where regional data sharing can contribute to safety understanding.

Key learning points

2.6 The regional data sharing initiative has achieved its initial implementation objectives. Several key elements have proven crucial to the initiative's success.

2.7 Data governance principles and robust data confidentiality and protection protocols are critical to build trust in the sharing of data. These high-level protocols are captured in the Memorandum of Understanding (MOU) signed by each participating State. It demonstrates commitment to share data solely for enhancing safety and not for other purposes such as enforcement. Apart from the MOU, the initiative has also developed a Procedural Handbook to detail procedures to support data confidentiality and protection.

2.8 The data shared has been de-identified at two levels – i) data provided by States does not include data identifying any organisations or personnel; and ii) data shared by States is sent to the Data Custodian, such that the participating States preserve anonymity in the provision of the occurrences. CAA Thailand, the existing Data Custodian, plays a pivotal role in ensuring consistent management practices and maintains data integrity throughout the data collection processes. The de-identification process has proven particularly effective in encouraging comprehensive data sharing while preserving confidentiality.

2.9 The standardisation of data elements has also enhanced the quality and usability of shared information. Participating States have successfully implemented common taxonomies aligned with CAST/ICAO Common Taxonomy Team (CICTT) standards and unified data templates. This standardisation has streamlined data collation and processing, and enabled more effective analysis. Additionally, systematic processes for identifying and eliminating duplicate entries, particularly for occurrences reported to multiple authorities, have enhanced data accuracy and reliability.

2.10 The initiative is expanding its scope of shared occurrences, with participating States now considering the sharing of new occurrence categories. These include runway incursions, unstabilised approaches (that continued to land), and wildlife sighting. These additions will further enhance the initiative's capability to identify and address safety concerns in the region.

3. ACTION BY THE CONFERENCE

3.1 The Conference is invited to:

a) Note the progress made in the regional data sharing initiative, and

   i. the need for an agreed set of data governance principles and robust data confidentiality and protection protocols supported by detailed procedures; and

   ii. standardised use of taxonomy and related data to facilitate data collation.

b) Note the preliminary safety information presented through this initiative, as additional reference for the development of safety initiatives.

c) Support the expansion of this regional data sharing initiative by encouraging interested States/Administrations in the Asia-Pacific region to participate in the initiative, or to attend as observers if they require more understanding of the initiative before deciding on participation.

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