ICAO

INTERNATIONAL CIVIL AVIATION ORGANIZATION

Tenth Meeting of the Regional Aviation Safety Group for the AFI Region (RASG-AFI/10)

7 November 2024

Agenda Item 4: Status of implementation of the GASP safety goals, targets and indicators including the priorities set for the RASG-AFI Region

4.3. Other Safety initiatives

Implementation of Safety Intelligence in Cameroon

(Presented by Cameroon)

SUMMARY
The proposed amendment 2 to ICAO Annex 19 recommends the implementation of intelligent safety data analysis at the national level, emphasizing the critical role of collecting and analyzing safety data to proactively identify risks. This information paper examines Cameroon's approach to fulfilling these requirements, highlighting the State's transition from traditional data analysis methods to more advanced technological solutions. Action by the Meeting: The meeting is invited to a) Note the information presented in this paper b) Encourage regional knowledge sharing in intelligent safety data analysis

Strategic Objectives	**Safety**

1 INTRODUCTION

1.1. The proposed Amendment 2 to ICAO Annex 19 recommends that States establish a strategy for the development of safety intelligence to support safety management and decision-making. This recommendation underscores the critical importance of leveraging data analysis to enhance aviation safety at the national level.

1.2. To support the development and implementation of the safety intelligence strategy provisions proposed in Annex 19 Amendment 2, ICAO, in coordination with expert groups, is working on the publication of the new ICAO Doc 10159 — Safety Intelligence Manual. This document is expected to provide valuable guidance to States in their efforts to enhance their safety intelligence capabilities.

1.3. While awaiting the publication of this document, it is invaluable for States to share their experiences in deploying safety intelligence at a national level. This knowledge sharing can help States make the most of the data gathered through their Safety Data Collection and Processing Systems (SDCPS) using up-to-date data analysis technologies.

1.4. In response to this evolving landscape, Cameroon has embarked on a phased implementation strategy for safety data intelligence. This information paper outlines Cameroon's journey from basic Excel analysis to more sophisticated data visualization and analysis using Power BI. As the volume of collected safety data continues to expand, Cameroon is actively exploring the integration of advanced data analysis tools to further enhance its capabilities and align with global best practices in aviation safety management.

2. DISCUSSION

Evolution of Cameroon's Safety Data Collection and Analysis

2.1. ICAO Annex 19 mandates that States establish a safety data collection and processing system (SDCPS). This system consists of integrated processes and schemes designed to capture, store, aggregate, and enable the analysis of safety data and safety information. In line with this mandate, Cameroon initiated its safety data collection efforts in 2012 by implementing the first set of safety event notification forms.

2.2. In the initial phase of safety intelligence development, Cameroon relied on Microsoft Excel and ECCAIRS 4 for analyzing the safety data collected through these notification forms. This basic approach allowed us to produce graphs to illustrate trends and evolutions, informing high-level decision-making processes. While rudimentary, this method served as a crucial starting point for Cameroon's journey towards more sophisticated safety data analysis.

2.3. Since the inception of the safety notification system in 2012, Cameroon has witnessed a consistent increase in the number of notifications received from various industry stakeholders, including airlines, Air Navigation Service Providers (ANSPs), and airport managers. This growth can be attributed to the improved notification culture within the aviation sector. However, as the volume of information expanded, the limitations of basic Excel analysis became apparent, making it increasingly challenging to effectively analyze all the received data.

Implementation of Advanced Safety Data Intelligence

2.4. Recognizing the need for more sophisticated analysis capabilities, Cameroon took a significant step forward in 2023 by adopting Microsoft Power Business Intelligence (Power BI) as its primary tool for safety data analysis. This transition marked the next stage in Cameroon's safety intelligence journey, enabling more comprehensive and dynamic data processing.

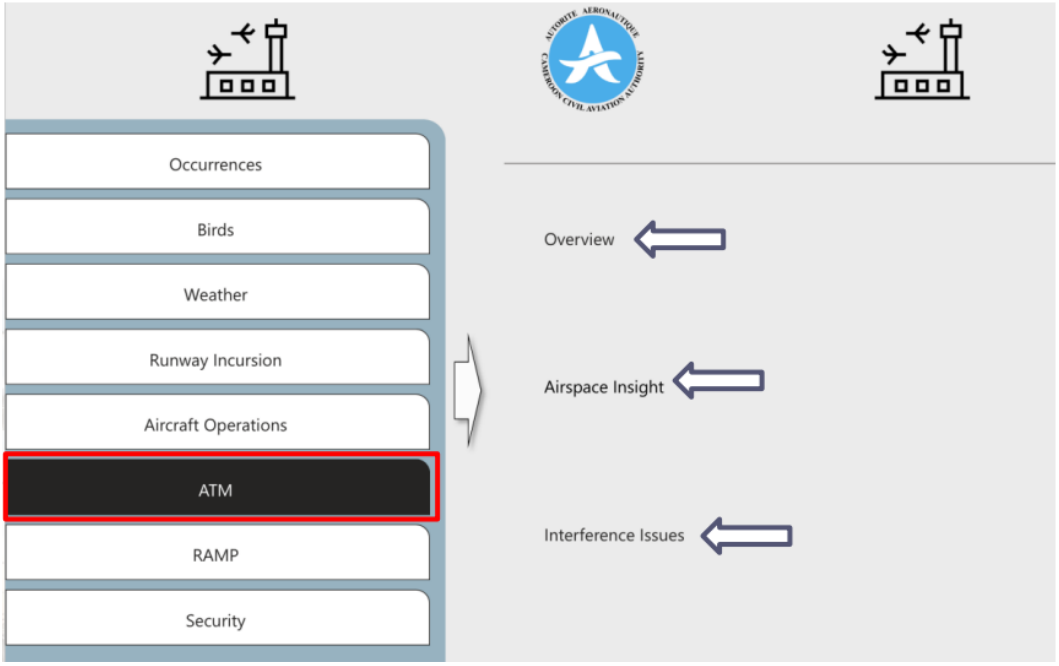

Figure: Analysis of the event category associated with the highest safety risk

2.5. Cameroon developed a customized interface within Power BI to extract valuable information from the notifications received across different domains of aviation safety. The welcome page of the online Power BI safety data analysis platform showcases this tailored approach, focusing on the main safety risk areas such as: Bird strikes, Weather-related incidents, Runway incursions, Air Traffic Management (ATM) events, RAMP incidents, Security issues.

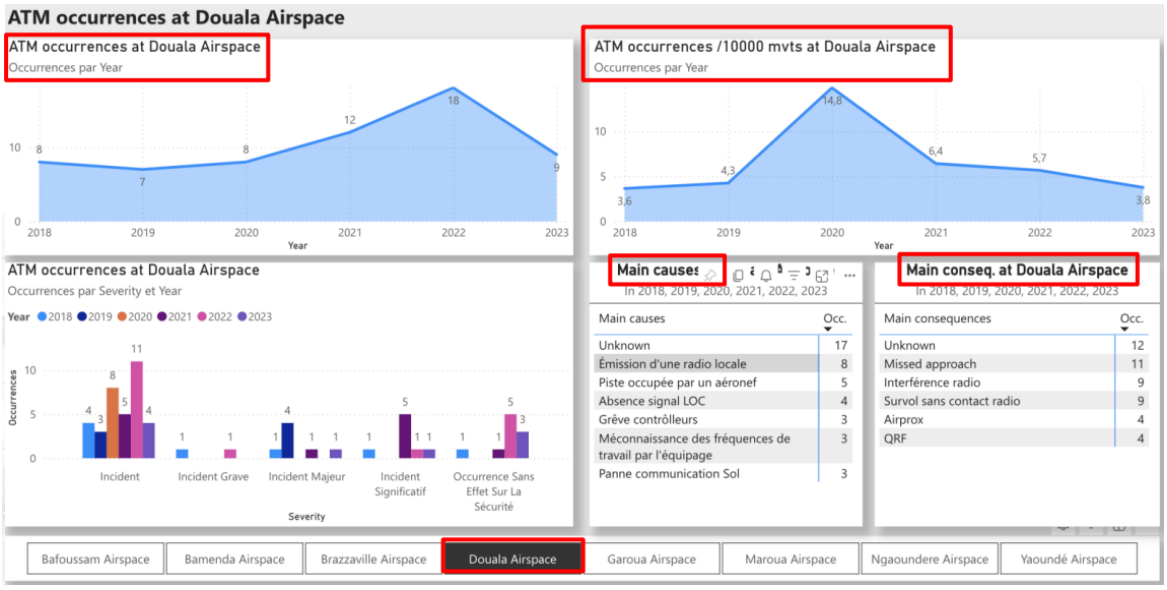

Figure: Advanced analysis ATM occurrences in the Douala Airspace.

2.6. For each of these domains, Cameroon designed a customized interface that serves as a dynamic dashboard for data analysis. This approach allows for:

- Domain-specific analysis: Providing in-depth insights into each safety area.
- Platform-specific analysis: Enabling detailed examination of data from individual

airports/airspace (e.g., Douala, Yaoundé-Nsimalen, Garoua).
- Trend analysis: Identifying patterns related to the causes of safety occurrences and their consequences, based on information from notification forms and subsequent analyses.

2.7. The transition to Power BI has significantly expanded Cameroon's safety data intelligence capabilities compared to the previous Excel-based system. Key improvements include:
- Comprehensive dashboards for each safety domain;
- Platform-specific incident dashboards; and
- Trend analysis for incident causes and consequences.

2.8. A major advantage of the new system is its ability to update automatically as new notifications are received from industry stakeholders. This feature enables Cameroon to:

- Obtain actionable insights from all incidents notified since 2012;
- Share informed and actionable insights with the aviation industry;
- Make national-level and airport/airspace-level decisions based on real data spanning a longer period.

Impact and Future Directions

2.9. The adoption of advanced analytical tools has made safety data intelligence a tangible reality for Cameroon. This new approach allows for the efficient analysis of large volumes of data, generating actionable insights that contribute to the ongoing improvement of aviation safety.

2.10. As the volume of collected safety data continues to grow, Cameroon is proactively exploring the integration of even more advanced data analysis tools to further enhance its capabilities. This forward-looking approach aligns with the broader industry trend of leveraging data science, advanced analytics, and artificial intelligence to extract actionable insights from safety data.

3 ACTION BY THE MEETING

3.1 The meeting is invited to:
a) Note the information presented in this paper; and
b) Encourage regional knowledge sharing in intelligent safety data analysis.