



WORKING PAPER

THIRTEENTH AIR NAVIGATION CONFERENCE

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COMMITTEE B

Agenda Item 7: Operational safety risks

7.1: Facilitation of data-driven decision-making in support of safety intelligence to support safety risk management

METHODOLOGY FOR GATHERING AND ANALYSING SAFETY DATA

(Presented by the Dominican Republic)

EXECUTIVE SUMMARY

Although technology covers everything in the modern world, when it comes to implementing programmes or using applications to help States comply with ICAO Standards, matters are not always so simple. This is because the programmes and applications often have to be integrated into existing systems, which almost always entails a contract with a company, which costs money.

Furthermore, the change in organisational culture required for more effective oversight, in terms of resource optimisation, takes time. Therefore, the sooner such an initiative is begun, the better for the system.

This paper presents a simple outline for first steps in gathering and analysing safety data for decision-making and safety risk assessment in a context of increasingly complex and automated programmes and applications, in support of State safety programme (SSP) implementation.

Action: The Conference is invited to:

- a) raise awareness in States about the need to bring a change in safety management culture, with simple processes that optimise resources; and
- b) request ICAO to take action to foster the creation of uniform processes in States that promote the sharing of safety data.

1. INTRODUCTION

1.1 From time to time, States must implement or deliver activities with little or no guidance. This is the case for the gathering, analysis and sharing of safety data, one of the elements of State safety assurance in the framework for implementing and maintaining the State safety programme (SSP) under Annex 19 — *Safety Management*.

¹ Spanish version provided by the Dominican Republic.

1.2 Under this element, States are required to establish mechanisms to ensure the capture and storage of data on safety risks and hazards. The data stored is prepared as safety information to support decision-making.

1.3 In view of the importance of data-driven decision-making by States and the complexity of analysing safety data in the initial phase of implementation and obtaining useful information, we are presenting as an alternative a safety information management process. The main goal is to gather and analyse safety data and disseminate safety information using a simple and practical methodology that serves to process and extract information to support safety decisions, without investing more resources than usual.

2. SAFETY INFORMATION MANAGEMENT PROCESS

2.1 The first step is to create a reporting channel for service providers, for both the voluntary/confidential report and the serious incident and accident report. This could be by email, voicemail or any other available means of contact. These reports feed into the database of the safety data collection and processing system (SDCPS). The main source of information on safety occurrences is the air navigation service provider, the largest State service provider with the most complex operations, whose safety management system (SMS) is approved and certified by the State. The data provided by this entity allow for a crosscheck on safety occurrences in the course of operations for the whole of the State aviation system, which guarantees the quality of the data used for effective decision-making and continual improvement of safety.

2.2 The next step is to develop a safety information management process in which all of the safety data gathered from reports is turned into valuable information. The process is composed of three overarching phases of activity: *safety data gathering*; *safety data analysis*; and *dissemination of safety information*.

2.3 The *safety data gathering* phase is carried out using the reporting systems created. Service providers access the reporting system by the approved channels. On receiving a report, we check the information provided for compliance with the quality standards and determine whether the event has a safety impact. All reports are recorded in the *Safety Matrix*, which was created with the Microsoft Excel spreadsheet application. The matrix has the following fields:

- | | |
|------------------------------|-------------------------------|
| a) Safety occurrence number | g) Owner/operator |
| b) Origin/source | h) Type of service provider |
| c) Is there a safety impact? | i) Aircraft registration |
| d) Date of occurrence | j) Aircraft manufacturer |
| e) Place of occurrence | k) Aircraft model |
| f) Details of occurrence | l) Type of occurrence (ADREP) |

2.4 *Safety data analysis* is performed periodically, for the main purpose of turning all the data gathered in the previous phase into information. To facilitate the analysis of all the safety data recorded for the reference period, an interactive Microsoft Excel table is used to summarise, analyse,

explore and present the safety data. In addition to the interactive tables, interactive graphs display the data in the tables to show comparisons, patterns and trends. Together, the interactive tables and graphs allow for dynamic decision-making including the prioritisation of oversight activities on the basis of areas of greatest risk, and the determination of the issues to be highlighted in the regular safety bulletins issued to service providers. The data analysed informs the *Report on Safety Occurrences* which is submitted to members of the *Safety Review Committee (CRSO)*. The following search criteria can be used to turn data into useful information for decision-makers:

- a) *Safety occurrences by type of occurrence*: This search option lists all occurrences impacting safety by type of occurrence, in accordance with the accident/incident data reporting (ADREP) taxonomy developed by ICAO;
- b) *Safety occurrences by aerodrome*: This search option lists all occurrences impacting safety by aerodrome of occurrence;
- c) *Type of occurrence by aerodrome*: This search option lists all occurrences impacting safety by type of occurrence in accordance with the ADREP taxonomy, and also by aerodrome of occurrence;
- d) *Safety occurrences by type of service provider*: This search option lists all occurrences impacting safety by type of service provider according to the details of the operating certificate;
- e) *Type of occurrence by type of service provider*: This search option lists all occurrences impacting safety by type of occurrence in accordance with the ADREP taxonomy, and also by type of service provider;
- f) *Safety occurrences by month*: This search option lists all occurrences impacting safety by month of occurrence;
- g) *Type of occurrence by month*: This search option lists all occurrences impacting safety by type of occurrence in accordance with the ADREP taxonomy, and also by month of occurrence;
- h) *Safety occurrences by airline/operator*: This search option lists all occurrences impacting safety by airline/operator involved;
- i) *Type of occurrence by airline/operator*: This search option lists all occurrences impacting safety by type of occurrence in accordance with the ADREP taxonomy, and also by airline/operator;
- j) *Safety occurrences by aircraft manufacturer*: This search option lists all occurrences impacting safety by aircraft manufacturer; and
- k) *Rate of safety occurrences by airline/operator*: This is a percentage figure for the number of recorded occurrences of an airline/operator compared to total operations in a given period.

2.5 *Safety information dissemination* is carried out periodically, for the main purpose of circulating general and critical safety information to stakeholders.

3. **CONCLUSION**

3.1 Changes in organisational culture take time. Often, when it comes to seasoned safety oversight personnel and methodologies and systems that rely heavily on people, there is great reluctance to leave the comfort zone.

3.2 This simple process is a first step in moving from a conventional to a proactive oversight framework that allows for the use and analysis of safety data in decision-making. ICAO is developing specific guidance material for process standardisation, and technologies and systems are being implemented that automate data analysis and optimise resources.

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