International Civil Aviation Organization

WORKING PAPER

ASSEMBLY — 38TH SESSION

TECHNICAL COMMISSION

Agenda Item 29: Aviation Safety – Monitoring and Analysis

ISSUES AND CHALLENGES RELATED TO
SAFETY DATA ANALYSIS AND ELECTRONIC SAFETY TOOLS

(Presented by the Republic of Korea)

EXECUTIVE SUMMARY
ICAO has been transitioning the international safety strategy towards a proactive and risk-based safety management framework in order to further promote the global aviation safety. For the successful implementation of new safety management framework, efficient and effective electronic tools are needed for the collection, processing, analysis and exchange of a number of aviation safety data that are essential in order to improve aviation safety.
This paper provides information on the experiences of the Republic of Korea (ROK) on the development of electronic safety tools, and presents issues and challenges related to safety data analysis and the use of electronic safety tools.
Action: The Assembly is invited to: a) note the information presented in this paper;   b) urge ICAO to develop more guidelines for Member States to have practical and useful safety information generated from the data collected, processed, analyzed and exchanged by electronic safety tools; and   c) urge ICAO to continue to improve functionalities of electronic tools and explore ways to facilitate the exchange of data between electronic safety tools developed by Member States and ICAO.

Strategic Objectives:	This working paper relates to the Safety, and Environmental Protection and Sustainable Development of Air Transport Strategic Objectives.
Financial implications:	Not Applicable.
References:	Doc 9859, *Safety Management Manual* Doc 10004, *Global Aviation Safety Plan* A38-WP/91: A strategic plan for the evolution of electronic tools for the global aviation community

1.   **INTRODUCTION**

1.1   Since accident/incident rates have been slowly decreased while air traffic volume has rapidly grown, ICAO has been transitioning its international strategy on the safety management from a prescriptive and compliance-based approach to a proactive and risk-based approach in order to further improve the global aviation safety.

1.1.1   In this regard, ICAO incorporated new requirements on the transitioning safety management framework into each Annex concerned including the Safety Management System (SMS) and the State Safety Programme (SSP), which have been combined in the new Annex 19 applicable in November 2013. Also, ICAO updated Global Aviation Safety Plan (Doc 10004) and Safety Management Manual (Doc 9859) for smooth launch of the new safety management framework.

1.1.2   Furthermore, since January 2013, ICAO has implemented the Universal Safety Oversight Audit Programme Continuous Monitoring Approach (USOAP CMA). This data-driven and risk-based approach requires Member States to provide ICAO with various types of data related to national safety oversight activities, which enable ICAO to continuously monitor and determine each State's safety risk profile indicated by the lack of effective implementation (LEI), present level and projected growth of State aviation activities related to critical elements (CEs), progress of the implementation of the SMS and SSP.

1.2   The transition to a proactive and risk-based approach in the safety management and the USOAP will increasingly require ICAO and Member States to collect, process, analyze and exchange a tremendous amount of aviation safety data that are essential to improve aviation safety, which has already been recognized at the 37th Session of the Assembly (Resolution A37-3).

2.   **DEVELOPMENT OF ELECTRONIC SAFETY TOOLS**

2.1   It is requisite that efficient and effective electronic safety tools be developed by ICAO and Member States to accommodate and manage multiple aviation safety data in a systematic manner towards the successful implementation of new safety management framework and USOAP-CMA.

2.1.1   In this regard, ICAO has developed various electronic safety tools as described in A38-WP/91 and A38-WP/50 in order to facilitate the provision and communication of safety-related data with Member States.

2.2   The Republic of Korea (ROK) has also developed National Aviation Resource Management and Information System (NARMI) in 2007 as an integrated web-based system to centralize all safety data available in about 20 different databases. And to assist in avoiding duplicative efforts and saving time and resources on the development of electronic safety tools in the world, the ROK has internationally shared the following systems:

> a) **SARPs Management and Implementation System (SMIS):** The SMIS was developed in 2006 as a web-based system for Civil Aviation Authorities (CAAs) to manage overall framework of compliance with the SARPs in a sustainable manner regardless of the size of the organization. Also, it assists in processing and managing numerous ICAO State letters and USOAP-related data in a timely manner; and

b) **Safety Oversight Management System (SOMS):** The SOMS was developed in 2009 as a web-based system for CAAs to manage overall framework of safety oversight activities on all the civil aviation sectors in an efficient and effective manner regardless of the size of the organization.

2.3   Furthermore, the ROK also joined the ICAO's SARPs Management and Reporting Tool (SMART) development project in 2012 in support for developing various modules under the SMART system such as Compliance Checklist/Electronic Filing of Difference (CC/EFOD), State Aviation Activities Questionnaires (SAAQ) and Protocol Questionnaires (PQ) and mission planning tool, which contributed to the successful launch of USOAP-CMA this year. The ROK will continue its support in 2013 to advance the SMART system and to develop the Foreign Air Operator Surveillance Database (FAOSD) for the Asia and Pacific Office of ICAO.

3.   **ISSUES AND CHALLENGES**

3.1   A key enabler for the successful implementation of the new safety management framework is how a number of data, as "safety source," are collected, processed, analyzed and exchanged for the hazard identification and risk management in a proactive manner, and how those data are transformed into practicable and useful information, as "safety knowledge," through detailed analysis.

3.2   While various electronic safety tools have been developed for the better collection, processing and exchange of "safety source," not enough guidelines are available on the methodologies for analyzing those collected "safety source" to generate and improve "safety knowledge." The ROK has also encountered a difficulty of accumulating "safety knowledge" due to a lack of standardized methodologies for analyzing a number of safety data collected through the NARMI, which need to be integrated, classified, refined and analyzed in support for developing safety targets and indicators as a part of implementing the SSP.

3.3   Furthermore, with the full launch of ICAO USOAP-CMA from this year, there has been a growing demand for Member States to take a number of actions which require a significant amount of time and effort much more than that under USOAP-Comprehensive Systems Approach (CSA). Member States are required to submit and keep up-to-date information of the safety oversight activities through the USOAP CMA online framework. This task includes the review of constantly amended Annex provisions and a great number of PQs and SAAQs and the update of the State's implementation status and corresponding evidences on the CMA online framework in a continuous basis. In order to reduce State's administrative burden on submitting the information online, ICAO should continue to improve the user-friendliness of the online framework.

3.4   Member States including the ROK have already developed an internal system for better management of the USOAP-CMA related data, which eventually needs to be submitted to ICAO. In an effort to assist such States, ICAO considers exploring ways to facilitate the exchange of data between electronic safety tools developed by Member States and ICAO.

4.   **CONCLUSION**

4.1   Even though the development of electronic safety tools has contributed to the improvement of collecting, processing and exchanging safety data amongst aviation stakeholders, Member States still have difficulties in improving their "safety knowledge" by analyzing "safety source" for the successful implementation of the proactive safety management framework. Accordingly, ICAO should develop more guidelines concerned for Member States.

4.2   Since ICAO and Member States have spent much effort to develop efficient and effective electronic safety tools in response to evolving safety management framework, those tools could be more efficient, effective, harmonized and sustainable if they are communicable with each other.

4.3   Through cooperation with Member States, ICAO should find a better way to facilitate the exchange of data between electronic safety tools developed by Member States and ICAO to minimize time and workload imposed on Member States.

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