



**WORKING PAPER**

**ASSEMBLY — 39TH SESSION**

**TECHNICAL COMMISSION**

**Agenda Item 33: Aviation safety and air navigation monitoring and analysis**

**PROGRESS IN SAFETY PERFORMANCE MANAGEMENT**

(Presented by China)

**EXECUTIVE SUMMARY**

Element 3.1, “safety performance monitoring and assessment”, of ICAO Safety Management System (SMS) calls upon Member States to implement safety performance management based on risk management and information management. The Civil Aviation Administration of China (CAAC) has actively responded to the call of ICAO by conducting work in research, experiment and expansion of safety performance management.

This working paper presents an overview of the process in which the CAAC has recently carried out pilot projects in safety performance management as well as the results of those projects. In conclusion, the paper has also made specific proposals regarding ICAO’s work to provide guidance and unify approaches in the management of safety performance.

**Action:** The Assembly is invited to:

- a) request ICAO to summarize the methods used and experience and lessons learned by Member States in conducting safety performance management in order to unify the concepts and specific approaches of various Member States in this field and develop relevant guidance materials to enable them to conduct work in safety performance management in a scientific and standardized manner;
- b) request ICAO to organize training, exchange of experience and forums on the topic of safety performance management so as to provide guidance to Member States on their work in this field.

<i>Strategic Objectives:</i>	This working paper relates to the Safety Strategic Objective.
<i>Financial implications:</i>	
<i>References:</i>	

<sup>1</sup> Chinese version provided by China

## 1. INTRODUCTION

1.1 In 2013, ICAO published Annex 19, *Safety Management* and Doc 9859, the third edition of the *Safety Management Manual*, detailing the content of Element 3.1, “safety performance monitoring and assessment”, and called for the implementation of safety performance management based on risk management and information management.

1.2 In response to ICAO’s call, the CAAC, on the basis of regulations, risks and information management, has been actively pursuing work in research, experiment and expansion of safety performance management in a bid to achieve the transition from compliance-driven management to management of safety performance based on regulations.

1.3 From January 2015 to June 2016, the CAAC, based on pilot projects implemented in the central-south region of China in 2010 and one in Huaxia Airlines Limited in 2014, made an industry-wide selection of 11 representative airlines and 1 airport to be engaged in experiments in safety performance management for a period of one and a half years. A debriefing meeting was held on those pilot projects in June 2016. As the next step, the rich experience and results thus accumulated will be extended to the entire industry.

## 2. DISCUSSION

2.1 In 2010, the CAAC launched an experimental project in safety performance management at Huanghua International Airport in Changsha and gained initial experience in this approach and gradually extended it to nine other airports in central-south China.

2.2 In 2013, in the wake of the publication of Annex 19, *Safety Management* and Doc 9859, *Safety Management Manual* (Third Edition), the CAAC undertook more in-depth research and summary of the concepts, technical methods and practical experience in safety performance management. The purpose of safety performance management was then identified as one to monitor the risk level of service providers, validate the effectiveness of SMS implementation and achieve safety performance by service providers.

2.3 In 2014, the CAAC formally launched a safety performance management pilot project in Huaxia Airlines Limited. The pilot consisted five stages of pre-preparation, target-setting, revision of documentation, monitoring of operations and project summary and debriefing. Explorations carried out through the experimental project yielded initial results in the form of theoretical concepts, procedures and methods for safety performance management.

2.4 From January 2015 to June 2016, in order to further improve work in safety performance management and accumulate more and better experience and practical expertise, CAAC selected from across the industry 12 representative service providers (11 airlines and 1 airport) to be engaged in further pilot work in safety performance management.

- a) The principal purposes of the pilot projects were to explore the model and methods of safety performance management suited to the Chinese civil aviation industry, facilitate the efforts of service providers to enhance management of prominent issues, key links and processes, achieve an overall reduction of safety risks and a raise in the level of safety, and to study the possibility of establishment by the CAAC a performance-based safety regulation model to achieve greater efficacy and effectiveness in safety regulation.

- b) Organizations involved in the experiments and their respective responsibilities were as follows. The CAAC was responsible for the overall planning, progress and quality control of the pilot projects; the regional bureaus organized pilot projects in their respective jurisdictions and provided day-to-day supervision, inspection and guidance; the regulatory bureaus, in consultation with experimenting civil aviation enterprises and institutions, developed safety performance targets and provided safety performance regulation; the pilot service providers were responsible for the actual conduct of the experimental projects, the setting of safety performance indicators, targets and alerts and the exercising of routine monitoring and control; and the aviation science academies provided training, guidance and technical support for the pilot projects.
- c) In February 2015, CAAC issued *the CAAC Overarching Program for the Conduct of Pilot Projects in Safety Performance Management*, setting out general arrangements and specific work requirements for the relevant entities. From March to June 2015, training sessions on safety performance management were organized in multiple localities, drawing over 700 participants from administrative bureaus, regulatory bureaus and service providers.
- d) The various service providers involved in the experiments first made an assessment of differences existing in safety management in order to identify gaps between the current practice and the requirements of safety performance management, and in light of those differences, worked out specific pilot work plans.
- e) As risk management constitutes an important foundation for safety performance management, work was done by each pilot service provider to sort out and update the compilation of sources of hazards, unify the criteria for identifying hazard sources, standardize the setting of key words in the compilation, and conduct causation analysis, risk assessment and control on those sources.
- f) On the basis of risk management, each pilot service provider, through positive and reverse analysis of risks, information statistical analysis and personal interviews, established a system of safety performance indicators, assigned specific safety alert values to and course of action for those indicators, and on this basis, carried out trial operations of safety performance management and collected safety information necessary for monitoring safety performance indicators and exercising risk control.
- g) Each pilot service provider formulated working procedures for safety performance management and specified responsibilities, processes and methods for identifying safety performance management indicators, alerts, and monitoring/ controls.
- h) Regulatory bureaus under whose jurisdiction pilot service providers were located also participated in the work leading up to the establishment of the providers' safety performance management system, developed consultatively safety performance indicators and carried out monitoring work on a monthly basis on the progress of each pilot service provider's safety performance indicators.

2.5 In June 2016, CAAC convened a debriefing meeting on industry-wide pilot projects on safety performance management. At the meeting, various pilot service providers and the administrative bureaus involved presented progress in the experimental work on safety performance management, as well as results achieved and difficulties encountered, discussed common and salient issues, and proposed comments and recommendations for improvement.

2.6 Achievements of the experimental work:

- a) Pilot entities have deepened their understanding of safety and safety management work and formed a basic knowledge of the processes and methods of safety performance management;
- b) Pilot entities have established mechanisms for safety performance management, identified corporate and divisional responsibilities and set up systems and operational procedures for them;
- c) Pilot entities have set up a basic system of safety performance management indicators, covering essentially all key links and important areas of operations and safety management, such as safety monitoring, flight operations, mechanical work, traffic control, cabin, cargo and ground handling.
- d) A complete program for building up safety performance management systems has come into existence, encompassing organic and responsibility structures, schemes and procedures building, methods for identifying safety performance indicators, implementing procedures for safety performance management, and key issues, difficulties and problems likely to arise in implementation.
- e) Studies have been done and conclusions drawn on methods for identifying safety performance indicators, including reverse analysis of unsafe events, positive analysis of sources of hazards, statistical work on safety information and personal interviews with manager, etc.
- f) Studies have been done and conclusion drawn on methods for setting up alert values; improvements have been made on the standard deviation alert method contained in Doc 9859, and in light of research results on varied amount of information and different types of indicators, multiple alert modes have been developed, including multi-tiered alerts, and alerts according to rolling values, frequency of occurrence or proportional ratios;
- g) An integrated risk indicators algorithm has been studied and established to calculate both corporate overall and divisional risk indicators (e.g., flight safety indicators, maintenance risk indicators, etc.). Through these indicators, the overall risk level and trends thereof of a corporation and its business divisions can be ascertained.

2.7 The CAAC bureaus and offices have developed the safety performance indicators in consultation with pilot enterprises, received monthly information briefings on safety performance management, exercised overall control over the safety status in pilot enterprises and initially explored the safety performance regulatory model.