



International Civil Aviation Organization

WORKING PAPER

AN-Conf/13-WP/203¹

20/9/18

(Information Paper)

English and Chinese only

THIRTEENTH AIR NAVIGATION CONFERENCE

Montréal, Canada, 9 to 19 October 2018

COMMITTEE B

- Agenda Item 6: Organizational safety issues**
6.2: Implementation of safety management
6.2.3: Developing safety intelligence

PROMOTION OF SAFETY PERFORMANCE MANAGEMENT

(Presented by China)

EXECUTIVE SUMMARY

In accordance with the requirements of Annex 19, the Civil Aviation Administration of China (CAAC) has carried out research, pilot and promotion on safety performance management in civil aviation industry under the guidance of Doc 8959 “Safety Management Manual”. From 2010 to 2016, the pilot work of safety performance management was conducted in airports in Central and Southern Regional of China and in 12 airlines in China. On the basis of summarizing the pilot experience, CAAC issued the “Civil aviation safety performance management promotion program” (Administrative Document) and “Safety performance management guidance manual for civil aviation production and operation entities” (Management Document) in April 2017. In 2018, CAAC issued the “Regulations on civil aviation safety management” (CCAR-398) to continuously promote safety performance management throughout the civil aviation industry.

1. INTRODUCTION

1.1 This document mainly introduces the background and methods of civil aviation safety performance management in China, especially focuses on safety performance management pilot and promotion. Finally, some suggestions are proposed for ICAO to provide guidelines of safety performance management and unify practice of safety performance management.

1.2 Annexes 1, 6, 8, 11, 13, and 14 were revised by ICAO to refine the framework requirements for implementing SMS to state parties in 2008. ICAO published annex 19 “Safety Management” and revised Doc 9859 “Safety Management Manual” in 2013, in which the requirements for element 3.1 “safety performance monitoring and evaluation” were described. The fourth edition of Doc 9859 “Safety Management Manual” was published in 2018, in which the requirements and practices of safety performance management were further elaborated, and more referable examples were provided on SMI.

¹ English and Chinese versions provided by China

1.3 According to the requirements of ICAO, CAAC actively promotes the research, pilot and promotion of safety performance management, and establishes safety performance management that meets both the requirements of ICAO and the actual requirements of China civil aviation. In 2010, CAAC officially launched the pilot work of safety performance management of Changsha Huanghua International Airport, and gradually extended to other nine airports in Central and Southern Regional of China. In 2014, CAAC officially launched the pilot work of safety performance management of China Express and accumulated certain experience and achievements. In 2015, CAAC continued to select 11 representative airlines and one airport for the one-year and a half pilot work of safety performance management. On the basis of summarizing the pilot experience, CAAC issued the “Civil aviation safety performance management promotion program” (Administrative Document) and “Safety performance management guidance manual for civil aviation production and operation entities” (Management Document) in April 2017. In 2018, CAAC issued the “Regulations on civil aviation safety management” (CCAR-398) to continuously promote safety performance management throughout the civil aviation industry.

2. DISCUSSION

2.1 The pilot process of safety performance management

2.1.1 In 2010, CAAC officially launched the pilot work of safety performance management of Changsha Huanghua International Airport, initially accumulated the experience of safety performance management, and gradually extended to other nine airports in Central and Southern Regional of China.

2.1.2 In 2014, CAAC officially launched the pilot work of safety performance management of China Express. The one-year pilot work was divided into preliminary preparation stage, safety performance indicator setting stage, document revision stage, operation monitoring stage and pilot summary stage.

2.1.3 In order to improve the technical methods of safety performance management and accumulate more and better experience, CAAC continued to select 11 representative airlines and one airport for the pilot work of safety performance management in 2015. In June 2016, the summary of the pilot work was held. The cases and methods of the pilot work were collected.

2.2 Safety performance management promotion requirements

2.2.1 In order to implement the requirements of annex 19, improve the SMS efficiency comprehensively and continuously improve the management mechanism based on safety performance, CAAC issued the “Civil aviation safety performance management promotion program” in April 2017 according to the “13th five-year plan for civil aviation safety production of China” and the “Reform plan of ‘enhancing safety supervision capacity’ of CAAC”.

2.2.2 The program explains the role and status of safety performance management in SMS and makes it clear that safety performance management is an important means to validate and verify the effectiveness of SMS implementation. It is required that the promotion work of safety performance management should be carried out in a planned, step-by-step, and hierarchical manner. The experience and problems should be constantly summarized and improved during the promotion process.

2.2.3 The program clarifies the promotion process of safety performance management into three stages. In the first stage, the safety performance management mechanism applicable to civil aviation organizations should be established and the supervision based on safety performance should be tried out.

The second stage is to establish an applicable supervision mechanism based on safety performance. In the third stage, safety performance management mechanism and supervision mechanism based on safety performance should be continuously improved. From the first stage to the third stage, the safety performance management efficiency of civil aviation organizations and the supervision efficiency based on safety performance are gradually improved. Meanwhile, the differentiated safety supervision will be achieved.

2.3 The implementation of safety performance management

2.3.1 The “Safety performance management guidance manual of civil aviation organizations” released in 2017 provides technical guidance for the implementation of safety performance management. According to the guidance manual, the implementation steps of safety performance management are as follows.

2.3.2 Safety performance indicators setting stage: the safety performance indicators can be divided into consequence type, operation type, safety management type, and safety foundation type. For the operation type indicators, forward analysis methods and backward analysis methods are recommended. The forward analysis methods are from the hazards to the intermediate unsafe activities or status, and then to the final serious consequence. On the contrary, the backward analysis methods are from the final serious consequence back to the intermediate activities or status, and then to the hazards. For the safety management type indicators and the safety foundation type indicators, brainstorming method, SMS factor method, system factor method, etc. are recommended. The ability and effect of safety management as well as resource allocation is reflected by these safety performance indicators. Through the setting of safety performance indicators, the safety performance management and risk management are closely integrated, and the monitoring of safety performance indicators can reflect the effectiveness of risk control measures. Specific steps include:

- 1) Safety performance indicators are determined through a variety of approaches;
- 2) Determining the target value and warning value of each safety performance indicator;
- 3) Identifying the monitoring data source and acquisition way for each safety performance indicator
- 4) Determining control measures for each safety performance indicator (action plan)

2.3.3 Document revision stage: after the safety performance indicators are designed, if it is found that the acquiring ways of safety performance indicators monitoring data need to further expand, such as adding safety check items or introducing automatic systems, the documents involving data collection of safety performance indicators need to be revised. If it is found that the control measures involving the adjustment of workflow, the documents involving control measures of safety performance indicators need to be revised.

2.3.4 Operation monitoring stage: the purpose of safety performance management is not only to evaluate whether the safety performance objectives are achieved, but more importantly to achieve continuous improvement of the organization's safety performance through safety performance management. The improvement of safety performance management can be classified into three levels:

- 1) The improvement of safety performance levels: it is necessary to carry out in-depth cause analysis to find out the root causes of the unsatisfactory safety trend, the breach warning value and the failure of the safety performance target, then revise the safety action plan, or strengthen the implementation and supervision of the safety action plan, so as to improve the organization's safety performance.

2)The improvement of safety performance indicators and targets system: The safety performance indicator system should be evaluated according to the changes of internal environment (including department responsibilities, personnel structure, operation environment, working environment, etc.) and external environment (including new regulations issued by CAAC and new operation specifications, etc.). The safety performance indicator system should be adjusted if it is not tally with the actual operation situation. Similarly, the target value of each safety performance indicator should be adjusted on the basis of the rationality evaluation according to the changes of internal and external environments.

3) The improvement of safety performance management system: service providers shall periodically to review and improvement of safety performance management system. The review contents should include at least: procedures, organizational structure, technical methods of safety performance management, the suitability and effectiveness of safety performance indicators and target system, and the effectiveness of safety performance management. After the review of the safety performance management system, the safety performance management program should be further revised and improved to continuously promote service providers' safety performance management.

2.4 CAAC plans to establish an industry-wide comprehensive safety performance monitoring system based on the integration of the safety performance data, the mandatory reporting information, wireless QAR data (QAR wireless base station is under construction), the surveillance information, etc. Then these big data can be used to monitor the safety performance level of civil aviation industry in a more scientific and comprehensive manner.

3. CONCLUSION

3.1 ICAO should provide guidance to states parties on safety performance management through training, experience exchange and forums.

3.2 ICAO should provide guidance on the methods, tools and documents of safety performance management to service providers based on the summary of good experience of state parties. Examples on SMI should be classified by different factors, such as service provider type, the scale of service provider, etc.

3.3 ICAO should provide guidance on the methods and tools of safety performance supervision to state parties based on the summary of good experience. The problems and difficulties in data collection, analysis and integration should be solved jointly. The guidance documents of safety performance supervision should be provided.

— END —