



International Civil Aviation Organization

NORTH AMERICAN, CENTRAL AMERICAN AND CARIBBEAN OFFICE

Regional North American/Caribbean (NAM/CAR) Air Traffic Management (ATM) Meeting

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NAM/CAR ATM - WP/06

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Agenda Item 4: Programmes related with the implementation of an Air Traffic Management (ATM) safety management system, Air Traffic Services (ATS), incidents investigation and runway safety (runway incursions) Quality Assurance.

ATM SAFETY MANAGEMENT SYSTEM

(Presented by the Secretariat)

SUMMARY

This Working Paper discusses the importance of AT safety management system as a mean to ensure international civil aviation safety envisaging a rapid increase of the global air traffic.

References:

- CAR/SAM Regional Guidance Material on ATS Quality Assurance Programmes
- Annex 11 - *Air Traffic Services - 13th ed*
- Doc 9859 – *Safety Management System*

1. Introduction

1.1 Compliance with Standards and Recommended Practices (SARPs) continues to be a cornerstone of international civil aviation safety. However, a rapidly expanding industry and resource limitations within oversight authorities make it increasingly difficult to sustain a safety management approach exclusively based on regulatory compliance. It is essential to complement the regulatory approach of safety management with a performance-based approach.

1.2 A performance-based approach to the management of safety can be presented as a three-step process. In the first step, oversight authorities and operators/services providers agree on the safety performance to be expected from the operators/service providers while conducting their core business functions. Safety performance is usually expressed through a metrics comprising safety indicators and safety targets. In the second step, oversight authorities and operators/services providers concur on the safety requirements necessary to achieve the safety performance agreed upon in step one. Safety requirements usually include the array of tools and means (programmes, systems, procedures, technology and so forth) available to operators/services providers. In the third step oversight authorities verify achievement of the agreed safety performance or its lack thereof, and operators/service providers correct observed deviations.

2 Analysis

2.1 Safety has always been the most important issue in all aviation activities. This is reflected in the aims and objectives of ICAO as stated in Article 44 of the *Convention on International Civil Aviation* (Doc 7300), which charges ICAO with ensuring the safe and orderly growth of international civil aviation throughout the world. The Strategic Objectives of ICAO for 2005 to 2010 include Strategic Objective A: Safety – *Enhance global civil aviation safety*, Key Activity A8: Support the implementation of safety management systems across all safety-related disciplines in all States.

2.2 This work has already started, with a proposal for harmonizing safety management provisions in Annex 6 — *Operation of Aircraft*, Part I — *International Commercial Air Transport — Aeroplanes*, and Part III — *International Operations — Helicopters*, Annex 11 — *Air Traffic Services*, and Annex 14 — *Aerodromes*, Volume I — *Aerodrome Design and Operations*. The *ICAO Safety Management Manual* (Doc 9859) has been developed as essential guidance material to support the implementation of the harmonized provisions relating to safety management in Annexes 6, Parts I and III, 11 and 14, Volume I.

2.3 Doc 9859, posted on the ICAO-NET (http://www.icao.int/icaonet/index_ie.html) is a unified source of safety management information. It includes a section that discusses generic safety management concepts, applicable across aviation activities, followed by sections on specific activities (operators, maintenance organizations, air traffic service providers and aerodrome operators).

3. The management of safety

3.1 The efficient and effective management of any aviation organization, regardless of the nature of its functions or its size, requires the management of basic and traditional business processes: financing; budgeting; communicating; allocating resources; and so forth. In recent years, managing safety has been added to the list of basic and traditional business processes. Managing safety should now be as much a part of running an aviation organization as managing any of the traditional business processes. The term **safety management** conveys the notion that the management of safety is a business process that must be considered at the same level and along the same lines as any other business process.

3.2 Certain approaches for the management of safety are set in motion only after some triggering event, such as an accident, incident or reportable event, discloses a safety concern. For this reason, such approaches may be considered outcome-driven and reactive. They need an outcome in order to react and engage the safety management process. In these approaches, responsibility for monitoring outcomes and the remedial action to the safety concerns that are underlying such outcomes may be scattered within the organization, depending on the sector(s) involved (flight operations, maintenance, ramp, cabin and so forth) in the event leading to the outcome. Furthermore, lines of accountability for safety monitoring and safety responses may not always be clearly articulated and, if they are, safety accountability generally stops at the middle management level.

3.3 SMS, on the other hand, involves the collection and analysis of on-going and routine safety data during the course of the activities that an organization must pursue every day while conducting its core business functions, in addition to reacting to outcome data. For this reason, SMS may be considered process-driven and proactive. Great volumes of data are continuously collected and analyzed, which provide for a principled basis to the definition of activities and allocation of resources to address safety concerns in a proactive manner. The term **system** conveys the notion of an integrated set of processes aimed at managing safety that crosses departmental boundaries, thus addressing safety concerns from an integrated, broad perspective.

3.4 An SMS is thus a systemic approach to the management of safety that includes the necessary organizational structure, accountabilities, policies and procedures. In order to reinforce the notion of safety management being a managerial process, SMS requirements include provisions for an organization to establish lines of safety accountability throughout the organization, as well as at the senior management level.

3.5 Doc 9859 represents the first stage of the adoption process of a harmonized approach with regard to safety management based on systems, described on the global ATM operational concept, organised in such a way that firstly, the basic safety management principles be dealt with, which are common both to aerodromes as well as to ATS. That manual has specific sections for the implementation of the general principles of a safety culture in the aerodromes and the ATS.

3.6 Doc 9859 defines a close correlation between philosophy of safety management and this concept of a safety culture. The philosophy defines a way of thinking of safety; safety culture is the result of this way of thinking translated into actions, so that the organizational culture be oriented towards safety.

3.7 The risk measures only specify the occurrence frequency, whereas risk involves both the frequency as well as the seriousness. In the risk measure, the seriousness is implied in the occurrence which frequency is specified. Therefore, one might expect that an acceptable limit of incidents would be significantly different from a limit expressed in terms of deadly aircraft accidents.

4 Safety management ATM

4.1 Based on the requirements of Annexes 11 and 14 and Doc 4444, PANS-ATM, in force since November 2003, ICAO has developed new provisions for the implementation of safety management system (SMS) so that States may develop an action plan for its implementation. Likewise, a CD titled ICAO Runway Safety Toolkit was provided by the ICAO NACC Office to all the States of the NAM and CAR Regions.

4.2 The Global Aviation Safety Plan (GASP), included in ICAO website (www.icao.int/icao/en/anb), has been established as the global mechanism allowing consolidated coordination and notification of safety-related activities carried out throughout the world and presents at the same time an overview of all these activities in a sole document. The objectives of the Global Aviation Safety Plan (GASP) Programme are: to reduce the number of deadly accidents, regardless of the air traffic volume; and to achieve a significant decrease of the global accident rates, stressing the regions where these remain high.

4.3 The regional and national implementation of a safety management system and the goals to accomplish in ATM safety should take these objectives into consideration to ensure that they will help accomplishing global objectives.

5 Classification of incidents and causal safety factors

5.1 An investigation system is facilitated if the accident and incident events and causal factors are classified using a standard scheme, and the classified data are inserted in a database. A classification scheme (also known as *taxonomy*) comprises an event class hierarchy. ICAO has kept a global accident and serious incidents database notified by the States through the Accident/Incident Reporting (ADREP) System. The latest version of this system contains a widely expanded taxonomy including many categories related with ATS. The information of this system, including copies of the taxonomies, may be found in the Internet under <http://eccairs-www.jrc.it/>

5.2 The ECCAIRS (European Co-ordination Centre for Aviation Incident Reporting Systems) were adopted by ICAO with the aim of implementing taxonomies to facilitate the exchange of occurrence data between States and between States and ICAO. The ECCAIRS software is available to States at no cost and ICAO will distribute it through the Regional Offices. The Meeting should encourage the use of ECCAIRS, plan and monitor the level of ADREP/ECCAIRS implementation, and encourage States/Territories to share safety data.

5.3 States/Territories should also ensure that when entering data on safety incidents, note should be taken that the validity of the information derived from any database only will be as accurate as the data on which it is based. Therefore, it is important that the accuracy of the entered data be verified.

6. ATS Quality Assurance Programmes

6.1 Since year 2003 the ICAO NACC Office has undertaken several special implementation projects (SIP) for the Central Caribbean, the Eastern Caribbean and Central America with the aim of providing assistance for the implementation of Quality Assurance Programmes. Most of the States, Territories and International Organizations have reported substantial progress in the implementation of these programmes.

6.2 The implementation of ATS Quality Assurance Programmes has proven to be an efficient tool which fosters enhancements on ATM safety management through the establishment of several complementary programmes for the assessment of ATS performance such as the programmes of incidents notification and investigation; incidents prevention; verification and training for ATC proficiency; proficiency in the use of aeronautical language and of English language; and verification of the use of aeronautical phraseology.

6.3 In spite that these implementations have been successful in reducing incidents, there is still a big number of deficiencies concerning the ATC coordination cycle, and therefore it is necessary to consider other aspects regarding ATM performance assessment in order to attain an evolution towards an effective regional ATM safety management systems in the NAM and CAR Regions.

6.4 The implementation of an ATM safety management programme demands that related performance objectives be defined, and that suitable regional mechanism allowing to prove that these objectives are being met be established, which implies undertaking new tasks to measure the performance of the ATM system. Among these aspects are: sharing information on incidents and accidents in the web, the classification of risk and the suitable measures for its solution, as well as the regional collaboration for the harmonization and exchange of experiences, the results of the assessment of ATM performance shall not be under the minimum accepted levels concerning safety.

6.5 Considering the need for effectively evolve towards a regional ATM safety management system, the ICAO NACC Office has scheduled several events in order to assist States, Territories and International Organizations with this implementation.

7 Suggested actions

7.1 Taking into consideration the information presented in this Working Paper, the Meeting is invited to approve the following:

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CONCLUSION NAM/CAR ATM/1 REGIONAL ATM SAFETY MANAGEMENT SYSTEM

That the States/Territories/International Organizations of the NAM/CAR Regions:

- a) develop an action plan to implement an ATM safety management system through suitable systemic programmes;
- b) establish the acceptable levels and objectives with regard to safety, within the airspace and aerodromes of their jurisdiction;
- c) take the timely measures for the development of an ATM safety culture;
- d) foster analysis and co-operation meetings among their related specialist in order to share experiences for the effective implementation of ATM safety programmes; and
- e) participate in the activities carried out by ICAO in order to facilitate the implementation of a regional ATM safety management system.