



WORKING PAPER

**DIRECTORS GENERAL OF CIVIL AVIATION CONFERENCE
ON A GLOBAL STRATEGY FOR AVIATION SAFETY**

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Theme 2: Improving aviation safety

Topic 2.2

**IMPLEMENTATION OF SAFETY MANAGEMENT
SYSTEMS (SMS) IN STATES**

(Presented by the Secretariat)

SUMMARY

This paper discusses the importance of safety management systems (SMS) as a means to ensure international civil aviation safety in a rapidly expanding industry and within resource limitations of oversight authorities. The discussion is presented in the context of ICAO's activities to support the implementation of SMS in States across all safety-related disciplines, and includes the need for the commitment by States to cooperate with ICAO in SMS implementation.

Action by the Conference is in paragraph 6.

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 an approach to the management of safety based exclusively upon regulatory compliance. It is essential to complement the regulatory approach to the management of safety 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/services 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 agree 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 and last step, oversight authorities verify achievement of the agreed safety performance or its lack thereof, and operators/services providers correct observed deviations.

1.3 Performance-based approaches to the management of safety are best exemplified by safety management systems (SMS), and the maturity achieved by the SMS concept allows for its implementation on a global basis.

2. THE MANAGEMENT OF SAFETY

2.1 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.

2.2 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.

2.3 SMS, on the other hand, involve the on-going and routine collection and analysis of 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. They continuously collect and analyze big volumes of data that provides for a principled basis to the definition of activities and the 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.

2.4 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 business 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. ACTIVITIES BY ICAO

3.1 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.

3.2 Work on Key Activity A8 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. This manual 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). Doc 9859 is posted on the ICAO-NET (http://www.icao.int/icaonet/index_ie.html).

3.3 In continuation of the work that builds upon the harmonized provisions and Doc 9859 discussed in paragraph 3.2 above, the following critical tasks will be completed over the next two years:

- a) analysis of all Annexes to assess the feasibility of developing Standards and Recommended Practices (SARPs) to support performance-oriented regulatory approach to the management of safety in States;
- b) development of model regulations to support a performance-based regulatory approach to the management of safety in States;
- c) development of guidance material for the integration of safety management programmes by national oversight authorities, as well as the application of safety management systems and practices in aviation organizations; and
- d) development and delivery of a programme of seven training courses, one in each ICAO Regional Office to assist States to implement the harmonized provisions discussed in paragraph 3.2 above.

This will complete the first phase of the implementation of Key Activity A8, planned to coincide with the next ordinary session of the ICAO Assembly in September 2007.

3.4 In the programme of training courses under paragraph 3.3 d) above, three training courses are planned for 2006, and four training courses are planned for 2007. These courses will build upon the harmonized safety management provisions and Doc 9859. The objective of the courses is to develop participants' knowledge and understanding of safety management concepts and requirements for air operators, maintenance organizations, air traffic services providers and aerodrome operators, as well as to provide the means to assist with the implementation of the Standards and Recommended Practices (SARPs) on safety management.

3.5 The target audience for the courses are representatives from civil aviation authorities with responsibilities regarding the implementation of safety programmes, and the oversight and/or implementation of safety management systems, in the areas of aircraft operations, air traffic services, and

aerodromes. Since it is expected that participants who complete these courses will lead the implementation of SMS within their States, the course will include a final exam on a pass-fail basis.

3.6 Further and detailed information about the courses will be transmitted to States in due time. In the short term, the cooperation of States is critical for the success of the programme of training courses, in two specific areas. First, States may elect to sponsor one of the seven training courses. Second, States may elect to provide experts in safety management to supplement the ICAO course delivery teams.

3.7 It is recognized that the global training requirements for the introduction of Safety Management go well beyond the training courses planned by ICAO. In order to cater for this, ICAO is developing a “train the trainers” course, to standardize the delivery of the training by experts in safety management from States willing to cooperate with ICAO in this critical task. ICAO is also encouraging States to engage in bilateral or multilateral cooperation on the subject.

4. **FUTURE WORK**

4.1 Work beyond the first phase can only be outlined in broad terms at the present time, since the need and direction of follow up activities will, to a large degree, be dictated by the experience obtained during the first two years of deploying the activity. The following is envisioned:

- a) the development of focal points and enablers to further pursue safety management activities, including safety management training, on a regional basis;
- b) the establishment of safety data collection and analysis systems in States;
- c) the development of safety data analysis capabilities in States;
- d) the establishment of regional systems for the exchange of safety information and analysis;
- e) the networking of regional systems for the exchange of safety information and analysis with ICAO; and
- f) the enactment of national legislation(s) to protect all relevant sources of safety information, while allowing for the proper administration of justice in States (Assembly Resolution A35-17, resolving clause 1 refers).

5. **CONCLUSIONS**

5.1 Under the prevailing situation in international civil aviation, it is becoming increasingly difficult to dissociate safety from efficiency. Aviation organizations, no matter their core business activity or geographical location, must not only be safe but also efficient. Even organizations that are not directly involved in a measurable production activity, such as civil aviation administrations, are under pressure to discharge their mandate in the face of ever-diminishing resources, thus facing efficiency issues. Hence, the value and importance of SMS.

5.2 SMS presents the international aviation community with a principled, data driven approach to the prioritization of resources towards safety concerns that hold the greatest risk potential,

and towards activities likely to produce the biggest return on resources invested. In this manner, SMS presents the international aviation community with a clear means to do more with less.

5.3 The full potential of SMS will however, only be realized when the concept is adopted on a global basis, by all Contracting States and, through States, by as many aviation organizations as possible. In order for this global implementation to take place, States need to be fully aware and informed about the SMS concept and the means and tools for its implementation.

6. ACTION BY THE CONFERENCE

6.1 The Conference is invited to:

- a) support the implementation of safety management systems across all safety-related disciplines in all States;
- b) engage in far-reaching cooperation with ICAO in the programme of training courses, discussed in paragraphs 3.4, 3.5 and 3.6 above, by sponsoring one of the seven training courses and/or by providing experts in safety management to supplement ICAO delivery teams;
- c) encourage States that are in a position to do so to assist other States in the implementation of safety management through the provision of expert advice, tools and other means; and
- d) commit to the earliest possible implementation of SMS on a global basis following the adoption of the related provisions by Council.

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