



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

Montréal, 20 to 22 March 2006

Theme 2: Improving aviation safety

Topic 2.2: Management of aviation safety

**INTRODUCTION OF SAFETY MANAGEMENT SYSTEMS TO
SINGAPORE AIR OPERATORS AND MAINTENANCE
ORGANIZATIONS**

(Presented by Singapore)

SUMMARY

This paper provides an overview of the key considerations and plans by the Civil Aviation Authority of Singapore to work towards introducing safety management system requirements for the Singapore aerospace industry.

1. INTRODUCTION

1.1 The Civil Aviation Authority of Singapore (CAAS) embarked on the implementation of its safety management system (SMS) in December 2001. The SMS was conceived to provide an integrated and systematic approach to the management of safety in operational areas such as the running of the Singapore aerodromes and air traffic control services, as well as in regulatory safety oversight areas.

1.2 Following the establishment of this SMS, the CAAS started in 2004 to put in place a strategy to introduce SMS concepts to the Singapore aerospace industry. This is also in line with ICAO's latest initiatives in 2005 to require States to mandate the implementation of SMS by their air operators and approved maintenance organizations.

1.3 This paper provides an overview of the key considerations and plans by the CAAS to work towards the introduction of SMS requirements for the Singapore aerospace industry.

2. KEY CONSIDERATIONS

2.1 The CAAS has regulatory safety oversight of seven Singapore air operators including Singapore Airlines, 130 commercial aircraft under its registry and 85 approved maintenance organizations. The task to provide safety oversight will continue to grow in breadth and depth as Singapore's aerospace industry is poised for growth in the Asia/Pacific Region. For instance, last year, the industry registered a record output of S\$5.2 billion, a 17 per cent increase over 2004. Annual compound growth rate of the industry over the last fifteen years was more than 12 per cent.

2.2 Given the highly regulated nature of the aerospace industry where organizations are already required to have comprehensive quality assurance programmes and are subject to regular safety audits, several key considerations have to be taken into account when developing a plan to introduce SMS to Singapore air operators and maintenance organizations. These include:

- a) the need to ensure that the organizations have a good knowledge of SMS concepts and principles, and their benefits to enhancing safety;
- b) the assurance that the SMS roll out plan will build on the foundation of existing safety regulations and programmes;
- c) the need to adopt a pragmatic but focused approach during the initial implementation phase by concentrating on key SMS elements.

2.3 SMS awareness

2.3.1 In early 2005, the CAAS conducted a survey to assess the level of SMS awareness among the 85 approved maintenance organizations. Although these organizations have quality assurance systems and various safety programmes such as investigation processes and safety training in place, the survey results indicated that only 23 per cent had some form of SMS awareness within the organization. This finding prompted the CAAS to focus initial efforts on raising SMS awareness within the industry.

2.3.2 An annual "Aviation Safety (SMS) Forum" with the theme "SMS Horizon for MRO/AOC" was held in July 2005 to spearhead our efforts to raise SMS awareness among management staff of maintenance organizations. The forum discussed the basic safety management system concepts and how they interact with, integrate and expand on the various safety programmes already in place. Progressive SMS themes for future aviation safety forums are planned as follows:

- a) SMS Implementation and Hazard/Risk Management;
- b) AOC/MRO SMS Implementation Review; and
- c) SMS: The Way to a Safe and Successful Business.

2.3.3 The CAAS also offers an intensive two-week "Integrated Safety Management Systems - Achieving World Class Safety Standards" course aimed at providing crucial SMS training in developing key competencies for personnel involved in the establishment of SMS within their organizations. This course covers a wide range of SMS-related topics, such as elements of an integrated SMS, human performance limitations, proactive hazard and risk management, and reporting and investigation programmes. It is currently being offered twice annually (in April and November) by the Singapore

Aviation Academy (SAA), a training arm of the CAAS, and attracts both local and overseas participants. More details are available at the SAA website at www.saa.com.sg.

2.4 Building on existing safety systems

2.4.1 It should be noted that existing safety regulations and programmes already contain some SMS features. For instance, the concept of management accountability has already been addressed through the requirement for an accountable manager in existing regulations. Existing safety programmes also have incident reporting and investigation, human factors training, safety documentation and safety audits, which are key elements of an SMS.

2.4.2 In addition, some safety programmes implemented by the industry are already comprehensive as these organizations have been scrutinized by key stakeholders over the years. For instance, most maintenance organizations in Singapore also hold regulatory approvals from other Civil Aviation Authorities (CAA). They have over the years established and refined their safety programmes to meet the requirements of each CAA. (Some of the larger maintenance organizations hold approvals from more than twenty CAAs and can be audited up to 140 times annually by regulators, customers and their own internal quality assurance system.)

2.4.3 These existing safety regulations and mature safety programmes will provide Singapore air operators and maintenance organizations with a solid foundation on which to build their SMS. On the other hand, organizations must ensure that their SMS integrates and encompasses these programmes, and not allow the SMS to become merely another add-on safety programme. To this end, the CAAS is currently studying how best to introduce SMS regulations that will, amongst other objectives, build on, integrate and encompass existing safety programmes.

2.5 Focusing on key SMS elements

2.5.1 In view of the above consideration to build upon existing safety regulations and programmes, any SMS roll out plan should focus on ensuring that the key SMS elements are appropriately integrated in the organizations' safety and quality assurance programmes. This would allow organizations to ensure a smooth transition as well as reap quick results and early benefits from the introduction of SMS. For a start, the following elements which are complementary to existing processes and embody the main principles of SMS should be considered:

- a) the systematic management of safety through integration of the various safety programmes as a core business process of the organization;
- b) the proactive management of hazards and risks to complement existing reactive incident investigation processes; and
- c) the emphasis on the role of human performance and limitations in socio-technical systems such as aviation.

3. **IMPLEMENTATION PLAN**

3.1 To ensure that safety is viewed as a management responsibility with the SMS being the integrating force behind the organization's safety programmes, regulations being drafted to mandate the implementation of SMS will be performance-based in nature. This will allow each organization to set up their own SMS to meet the safety objectives without having to follow a fixed, CAAS-prescribed method of compliance. It will also allow individual organizations to be able to better scope their safety management system to suit the size and complexity of their operations.

3.2 The CAAS is targeting to issue the relevant regulations by end 2006, to be effective in 2009. The three-year implementation schedule will provide time for air operators and maintenance organizations to put in place the necessary organizational structures, systems and processes to meet the new SMS regulations.

3.3 Between 2007 and 2009, the CAAS will actively encourage air operators and maintenance organizations to set up their own SMS. SMS implementation in individual organizations will be assessed during this period to ensure that progress is made towards meeting the effective date of the regulations in 2009. This plan will ensure that Singapore air operators and maintenance organizations will have no difficulty in meeting ICAO's proposed target date of January 2009 for the adoption of Standards relating to SMS.

4. **CONCLUSION**

4.1 The conference is invited to note the efforts by the CAAS to introduce the concept of safety management systems to Singapore air operators and maintenance organizations.

— END —