ELEVENTH AIR NAVIGATION CONFERENCE

Montreal, 22 September to 3 October 2003

Agenda Item 2: Safety and security in air traffic management (ATM)
2.1 Safety management systems and programmes :

SAFETY MANAGEMENT ACTIVITIES IN SINGAPORE

(Presented by Singapore)

SUMMARY

This paper provides an overview of the safety management activities in Singapore, in support of ICAO's initiatives to enhance aviation safety through the introduction of safety management requirements. The Civil Aviation Authority of Singapore has formalized its SMS for air traffic services and aerodrome operations. Through the Singapore Aviation Academy, Singapore is promoting SMS awareness internationally and providing urgently required training to equip States with the knowledge and expertise to implement SMS.

Action by the conference is in paragraph 5.

1. INTRODUCTION

1.1 In 2001, ICAO introduced new requirements in Annex 11 —*Air Traffic Services* and Annex 14 — *Aerodromes* for the adoption of safety management systems (SMS) by air traffic services (ATS) providers and operators of international aerodromes. The requirements called for States to implement ATS safety management programmes. ICAO also requires all aerodromes used for international operations to be certified by States by 27 November 2003 and for all certified aerodromes to have a SMS in place by 24 November 2005.

1.2 The ICAO global air traffic management (ATM) operational concept also calls for a system safety approach — a systematic and explicit approach defining all activities and resources devoted to the

management of safety. The approach requires the formal management of risks, in an integrated manner within an organization.

1.3 In support of ICAO's initiative to enhance aviation safety through the implementation of SMS and the adoption of a system safety approach, the Civil Aviation Authority of Singapore (CAAS) which operates Singapore's civil airports and provides air traffic services has formalized its SMS. A more systematic, proactive and integrated approach to managing safety within the organization has been established.

2. SMS MANAGEMENT STRUCTURE

2.1 Spearheaded by a top-level Safety Management Steering Committee (SMSC), the SMS initiative in CAAS is focused on the systematic management of safety in the areas of airport management, airport engineering, air traffic services, airport emergency services and the regulation of the local civil aviation industry. In each specific area, SMS in CAAS is driven by safety action groups.

2.2 The SMSC charts the direction for the implementation of SMS, and meets regularly to review the progress of SMS implementation and discuss new safety issues. An organization-wide SMS roadmap sets the milestones for the accomplishment of specific SMS elements such as the establishment of a safety policy, safety management principles, safety accountabilities and training. A CAAS SMS Manual, detailing these SMS elements in the organization, was completed last year.

3. ATS SAFETY MANAGEMENT PROGRAMME

3.1 ICAO Annex 11 and the *Procedures for Air Navigation Services — Air Traffic Management* (PANS-ATM, Doc 4444) require an ATS safety management programme to include the monitoring of safety levels, identification of hazards, implementation of remedial actions and safety reviews of ATS units. The CAAS ATS safety management programme addresses these elements.

3.2 Safety policy, principles and accountabilities

3.2.1 Safety is enshrined in the CAAS mission statement — "To provide the highest standard in safety, quality and service in civil aviation and airport operations". In accordance with its mission, CAAS aims to achieve a world class standard in safety. To demonstrate its top level commitment to safety, CAAS has developed a safety policy which recapitulates safety as one of CAAS' core values and sets out the general directions for effective safety management. Supporting the policy is a set of safety management principles which managers can then apply to manage safety in their day-to-day activities. All senior officers and managers are aware of their safety accountabilities and responsibilities, captured in their safety accountability statements.

3.3 Safety targets and incident reporting

3.3.1 At the operational level, safety targets have been established to ensure that the provision of ATS attain the highest safety standards. These targets, which are monitored on a monthly basis and reviewed annually, include the number of ATC incidents, number of birdstrikes, accuracy in NOTAMs and availability of critical systems such as the ATC system, navaids, radar, instrument landing system (ILS) and

communications systems. Any adverse trends detected would be acted upon promptly and remedial measures taken to address shortcomings.

3.3.2 An incident reporting system to capture air traffic incidents and system glitches has been put in place to facilitate the monitoring of safety levels. Air traffic incidents are investigated to determine the facts, conditions and circumstances pertaining to the incident, with a view to establish the cause(s) so that appropriate remedial and preventive measures, where necessary, could be implemented to avoid a recurrence. Lessons learnt from incidents are disseminated regularly to staff to heighten safety awareness.

3.4 Safety assessments

3.4.1 CAAS has a structured ATS safety assessment procedure - a formal, proactive and systematic process of identifying and resolving hazards arising from proposed changes in ATS systems, procedures or organization. Its objective is to take action to pre-empt problems that may arise due to the implementation of those changes, and hence maintain safe operations. For large-scale system implementation such as the third-generation Singapore ATC system — Long Range Radar and Display System (LORADS) III, a system safety case approach would be adopted as part of a comprehensive process to monitor project implementation from a safety viewpoint.

3.5 Safety audits

3.5.1 A framework for the conduct of regular safety audits of CAAS' operational ATS units viz the control towers and the Singapore ATC centre is being put in place. These audits are aimed at ensuring that processes comply with international standards and/or best practices. Shortcomings identified during the regular audits would be rectified promptly so as to maintain a high standard of safety in the operations of the ATS units. The need for safety enhancing measures would also be highlighted during these audits.

4. TRAINING IN SUPPORT OF ICAO'S SAFETY INITIATIVES

4.1 With ICAO's new safety initiatives, there is a need to make available relevant training to States. Recognizing this need, the Singapore Aviation Academy is committed to promoting awareness of and providing quality training in support of these initiatives.

4.2 Following the inclusion of SMS requirements in ICAO Standards and Recommended Practices (SARPs), the Singapore Aviation Academy (SAA) organized a Conference on Implementing Aviation Safety Management Systems in September 2002. The Conference, attended by more than 120 senior aviation officials from 17 countries, provided a good platform for regulatory authorities and the aviation industry to discuss and share international best practices in SMS in the areas of air traffic services, aerodrome operations and air safety.

4.3 Following the Conference, a Curriculum Development Panel drawn from some of the expert speakers at the conference developed a new course entitled *Safety Management Systems — Achieving World Class Safety Standards*. The course provides an understanding of the theory and practice of SMS to facilitate the design and implementation of an effective SMS to meet the new ICAO requirements. Over

50 participants from some 22 countries attended the first run of the course held from 28 July to 8 August 2003.

4.4 To cater to the overwhelming response for the course, the SAA has scheduled two more runs of the course — from 18 to 28 November 2003, and from 19 to 30 April 2004.

4.5 In addition, the SAA will be organizing a major Conference on ICAO Safety Audits on Air Traffic Services, Aerodromes, and Aircraft Accident and Incident Investigation from 5 to 7 April 2004. This is in response to Resolution A33-8 of the 33rd Session of the ICAO Assembly which directed that the ICAO Universal Safety Audit Programme be expanded to include Annex 11, Annex 13 — *Aircraft Accident and Incident Investigation* and Annex 14. These audits are scheduled to commence from 2004.

4.6 The conference will provide participants with an understanding of the rationale behind the new audit requirements and the scope of the audit, to assist States to prepare for the audit. Senior ICAO officials responsible for drawing up the new audit requirements and audit protocols of Annexes 11, 13 and 14 will share their knowledge and experiences through a combination of lectures, case studies and panel discussions.

4.7 Brochures and programme calendar of the above course/conference as well as other SAA training programmes will be distributed to delegates. Delegates can also refer to SAA's Web site www.saa.com.sg for latest updates and online registration.

5. ACTION BY THE CONFERENCE

5.1 The conference is invited to:

a) note Singapore's efforts in formalizing its ATS safety management programmes, in support of ICAO's initiatives to enhance aviation safety through the introduction of safety management requirements and a system safety case approach;

b) note Singapore's commitment in promoting SMS awareness and providing SMS training; and

c) note the upcoming Conference on ICAO Safety Audits on Air Traffic Services, Aerodromes and Aircraft Accident and Incident Investigation organized by the Singapore Aviation Academy to assist States in their preparation for the upcoming ICAO Universal Safety Oversight Audit of Annexes 11, 13 and 14.

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