

Global Safety Management System

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Content

- Safety management systems and programmes
- State responsibility
- Understanding Safety
- ICAO provisions on safety management
- ICAO Safety Management Systems Manual (Doc 9859)
- Eleventh Air Navigation Conference outcomes

ICAO purposes

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.

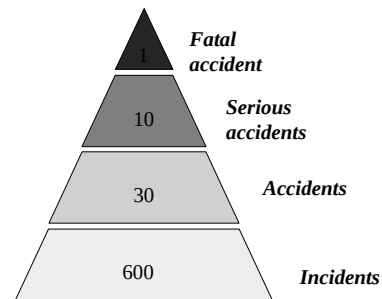
The State responsibility

- The State is responsible for providing a regulatory safety framework which forms the basis of the safety management requirements
- Where a State is also an ATM service provider:
 - It is important keep clear distinction between the regulatory functions and the service provision functions
 - The regulatory division must maintain effective safety oversight of the ATM service provisions

What is Safety?

- **Safety** is the state in which the risk of harm to persons or property damage is reduced to, and maintained at or below, an acceptable level through a continuing process of hazard identification and risk management.

1:600 Rule



Approach to Safety Management, ... may be considered from two different perspectives

- **Traditional.** Historically, aviation safety focused on compliance with increasingly complex regulatory requirements. This approach worked well up until the late 1970s when the accident rate levelled off; accidents continued to occur in spite of all the rules and regulations.
- This approach to safety *reacted* to undesirable events by prescribing measures to prevent recurrence. Rather than defining best practices or desired standards, such an approach aimed at ensuring minimum standards were met.
- With an overall fatal accident rate in the vicinity of 10-6 (i.e. one fatal accident per million flights) further safety improvements were becoming increasingly difficult to achieve using this approach.
- **Contemporary.** In order to keep safety risks to an acceptable level, contemporary safety management is shifting from a reactive to a *proactive* mode. In addition to a solid framework of legislation, regulatory requirements, approved procedures, and the enforcement of those requirements, a number of other factors are considered to be effective.

Approach to Safety Management, *Contemporary proactive mode;*

- a) Application of scientifically-based, risk management methods;
- b) Senior management's commitment to the management of safety;
- c) A corporate safety culture that fosters safe practices, encourages safety communications and actively manages safety with the same attention to results as financial management;
- d) Effective implementation of Standard Operating Procedures (SOPs), including the use of checklists and briefings;
- e) A non-punitive environment to foster effective incident and hazard reporting;
- f) Systems to collect, analyze, and share safety-related data arising from normal operations;

Approach to Safety Management, *Contemporary proactive*

Systems to collect, analyze, and share safety-related data arising from normal operations;

g) Competent investigation of accidents and serious incidents, identifying systemic safety deficiencies;

h) Integration of safety training (including Human Factors) for operational personnel;

i) Sharing safety lessons learned and best practices through the active exchange of safety information; and

j) Systematic safety oversight aimed at assessing safety performance and reducing or eliminating emerging problem areas.

ICAO Requirements, *Safety Management System*

- **Additionally, new Standards and Recommended Practices (SARPS) for Safety Management System will be introduced to Annexes 6, 11, and 14, Volume I (Nov/06).**
- **States must certify that all certified aerodromes must count with an implemented safety management system (SMS). Guidelines appear in the Manual on Certification of Aerodromes (Doc 9774).**
- **Complementary procedures also were introduced in the PANS-ATM (Doc 4444).**

ICAO Requirements, *Safety Management System*

- **The Safety Management Manual, Doc 9859, provides guidance for fulfilling the requirements of the SARPs of Annexes 6, 11, and 14 with respect to the implementation of safety programmes and safety management systems. Some of these requirements are expanded upon in the ICAO Procedures for Air Navigation Services — Aircraft Operations (Doc 8168) and Procedures for Air Navigation Services-Air Traffic Management (PANS-ATM, Doc 4444).**
- **The manual also assist States in the fulfilment of the SARPs of Annex 13 with respect to the investigation of accidents and incidents, including recommendations to States for the promotion of accident prevention by analysis of accident and incident data and by the prompt exchange of safety information.**

Safety Management System

- States shall require that individual operators, maintenance organizations, air traffic service providers and certified aerodrome operators implement ***Safety Management Systems*** approved by the State:
 - a) Identify actual and potential safety hazards;
 - b) Ensure that remedial action necessary to maintain an acceptable level of safety is implemented; and
 - c) Provide for continuous monitoring and regular assessment of the safety level achieved.

Safety Management System

A **Safety Management System** is an organized approach to managing safety, including the necessary organizational structures, accountabilities, policies and procedures. It provides organizations with:

- the capacity to anticipate and address safety issues before they lead to an incident or accident
- the ability to deal effectively with accidents and incidents so that valuable lessons are applied to improve safety

safety program

...an integrated set of regulations and activities aimed at improving safety, in an integrated and coherent manner.

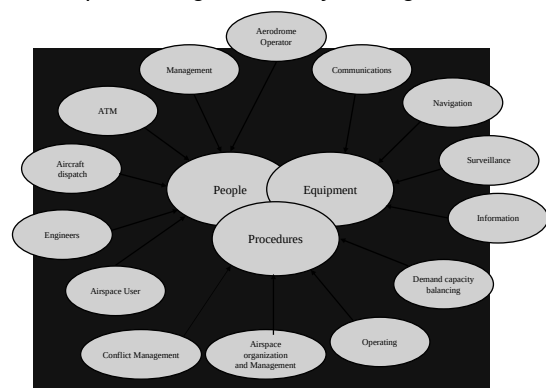
- A safety program may include many safety activities aimed at fulfilling the program's objectives; as well provisions for such diverse activities as incident reporting, safety investigations, safety audits, safety promotion, etc.
- Safety program embraces those regulations and directives for the conduct of safe operations in aviation from the perspective of aircraft operators and those providing air traffic services, aerodromes and aircraft maintenance.

Safety Management Program

Implementation of safety management programs refers to the day to day keep safety oversight management by the service providers

- States shall establish systemic and suitable ATS safety management programs with defined levels and objectives (PANS-ATM, in force since November 2003)
- The acceptable level of safety shall be established by the States. As appropriate, the target levels of safety (TLS) will be established through regional air navigation agreements.
- Prior to any significant change to the safety-related ATC system, a safety assessment will be carried out, proving that an acceptable safety level may be obtained
- SMS includes the establishment of runway safety programs.

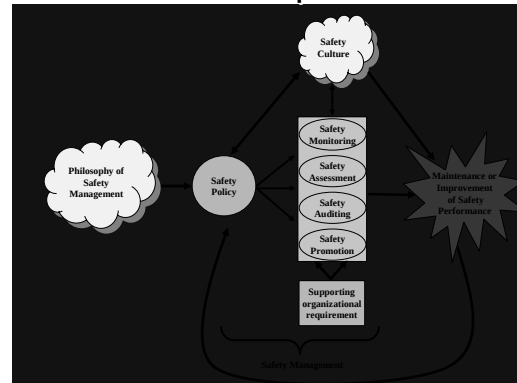
An integrated ATM Safety System requires Integrated safety management



The new Manual on Safety Management for Aerodromes and Air Traffic Services (Doc 9859)

- Provides detailed guidance on implementation of the provisions of Annexes 6, 11, 14 and the PANS-ATM
 - First Draft was endorsed by 11th Air Navigation Conference (Montreal, Sep/Oct 2003)
 - Current version in ICAO NET web
 - Based on the same approach to safety as recommended by the ATM Operational Concept (Doc 9854)

The Concept of SMS



Lifecycle management

- Safety not an “add on”
- Design safety into the whole system
- Life cycles of a system
 - from the:
 - concept phase
 - design and development phase
 - operation and maintenance phase

Next steps...

- Uniform approach in accordance with the AN-conf/11 outcomes
- Globally standardized safety management processes and practices
 - Avoids unnecessary duplication
 - Collect right data to monitor level of safety
- Broader view of ATM system expectations
- System Safety Approach

Preparation of an Operations Manual (Doc 9376) which provides detailed guidance to operators in such areas as training and the supervision of operations, and includes direction on the need to maintain an accident prevention programme;

Airworthiness Manual (Doc 9760) which provides guidance for the conduct of a continuing airworthiness programme;

Manual on Certification of Aerodromes (Doc 9774) which describes the salient features of a safety management system to be included in the aerodromes manual for certified aerodromes;

Human Factors Training Manual (Doc 9683) which describes in greater detail much of the underlying approach to the human performance aspects of accident prevention in this Manual;

Safety Oversight Audit Manual (Doc 9735) which provides guidance for the systematic conduct of safety audits, in particular for licensing, air operations, and airworthiness matters;

Human Factors Guidelines for Safety Audits Manual (Doc 9806) which provides guidelines for anyone preparing for or conducting a safety oversight audit which includes consideration of human performance and limitations – the source of most accidents;

Manual of Aircraft Accident and Incident Investigation (Doc 9756) which provides information and guidance to States on the procedures, practices and techniques that can be used in aircraft accident investigations;

Cabin Attendants' Safety Training (Doc 7192) which provides for the training for cabin attendants required by Annex 6;

Human Factors Guidelines for Air Traffic Management (ATM) Systems (Doc 9758);

Human Factors Guidelines for Aircraft Maintenance Manual (Doc 9824);

Line Operations Safety Audit (LOSA) Manual (Doc 9803); and

Human Factors Digest No. 16 — Cross-Cultural Factors in Aviation Safety (Circ 302).