EASA
European Aviation Safety Agency

ICAO Annex 19
‘Safety Management’

Your safety is our mission.

An agency of the European Union

Outline

The case for Safety Management

ICAO Annex 19

Part I

The case for Safety Management

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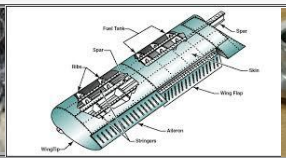
Concept of safety

- **What is safety**
  - *Zero accidents (or serious incidents)?*
  - *Freedom from danger or risks?*
  - *Error avoidance?*
  - *Regulatory compliance?*
  - *… ?*

- Controlled risk and controlled error is acceptable in an inherently safe system.
- Safety is a systems property, it can only be determined for the whole system under consideration.
- Safety constraints need to be enforced at all system levels. SMS provides the framework for this to happen in a systematic way.

Rate of accidents since 1945 & Evolution of safety thinking

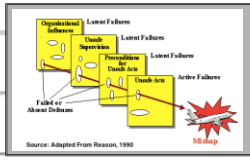

Technical

Better technology



Human

HF management, CRM, FRM etc…



Organisational

Quality Assurance, QMS
Threat & Error management

System safety

Safety management
SMS & SSP
addressing all of it :
better technology
Human & Organisational factors
compliance
risks
etc..

Global rate of accidents involving passenger fatalities per 100 million passenger miles, scheduled commercial air transport operations, excluding acts of unlawful interference

Why do we need to do more?

- Fast pace of technological change – new business models
- Changing nature of accidents
  - New types of hazards – emergence of **organisational accidents**
- Reduced ability to learn from experience
  - time to market for new products has greatly decreased
- Increasing complexity and coupling of system ‘components’
  - cause and effect are less and less related in a direct/linear way
- More complex relationships between humans and automation, role of software
- Changing regulatory and public views (perception) on safety

Organisational accidents

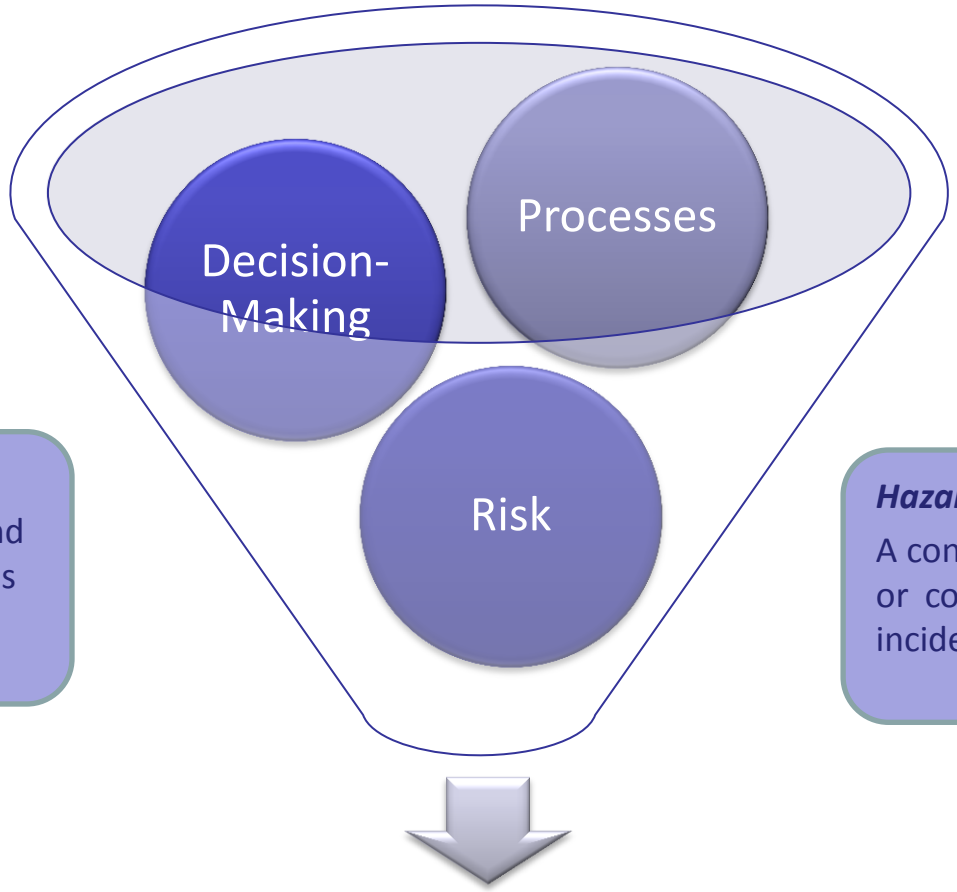
*The immediate cause of many accidents is identified as **human** or **technical** failure, but these in turn usually stem from **organisational failures** which are the responsibility of **management**.*

*"Individual accidents are by far the larger in number. Organisational accidents are comparatively rare, but often **catastrophic, events that occur within complex modern technologies**."*

"Organisational accidents have multiple causes involving many people operating at different levels of their respective companies…Organisational accidents are the product of recent times, or more specifically, a product of technological innovations which have radically altered the relationship between systems and their human elements."

James Reason, Managing the Risk of Organizational Accidents, Ashgate publishing, 1997.

What is a safety management system (SMS)?



Safety risk

The predicted probability and severity of the consequences or outcomes of a hazard.

Hazard

A condition that could cause or contribute to an aircraft incident or accident.

*A series of defined, **organisation**-wide processes that provide for effective risk-based decision-making related to a company's daily business.*

Key processes of an SMS

Hazard identification

- A method for identifying hazards related to the whole organisation (operational + systemic hazards)

Safety reporting

- A process for the acquisition of safety data not only related to product safety

Risk Management

- A standard approach for assessing risks and for applying risk controls

Performance Measurement

- Management tools for analysing how effectively the organisation's safety goals are being achieved

Safety Assurance

- Processes based on quality management principles that support continual improvement of the organisation's safety performance

QMS versus SMS

- Both QMS and SMS promote systems approach and continual improvement.
- QMS and SMS may use the same tools and techniques:
  - e.g. performance monitoring – Key Performance Indicators (KPIs),
  - management of business risks,
  - process mapping / system and process analysis,
  - auditing, surveys.
- An effective QMS will support the implementation of effective safety management processes.

BUT

- Quality management systems (QMS) are geared towards customer expectations and contractual/regulatory obligations.
- SMS is about identifying hazards and managing risks.
- Processes designed to produce a quality product/service alone will not guarantee safety (safety is a systems property, not a component property).

Part II

The case for Safety Management

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Starting point: ICAO High-level Safety Conference 2010

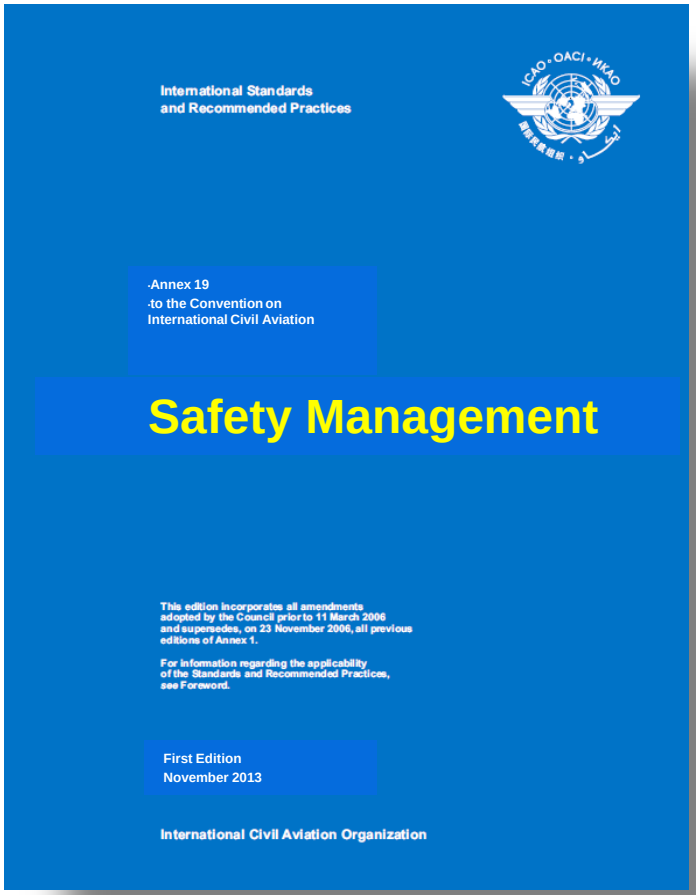
RECOMMENDATION 2/5: ICAO should develop, in close collaboration with States, international and national organizations, a ***new Annex dedicated to safety management responsibilities and processes*** which would address the safety management responsibilities of States framed under the State Safety Programme (SSP).

In response to the HLSC 2010 recommendation, the ICAO Air Navigation Commission recommended that the new Annex be developed in two phases:

- Phase 1 involved the consolidation of existing safety management provisions previously contained in as many as 6 different Annexes, into a single new Annex.
- The development of enhanced requirements is the focus of Phase 2 that started in November 2012.
- The first amendment of Annex 19 Edition 1 is scheduled for **November 2016**. It will then follow a **three-year amendment cycle**.

Transfer of common SSP/SMS elements from the existing ICAO Annexes

- **Annex 1**
  Personnel Licensing
- **Annex 6**
  Operation of Aircraft
- **Annex 8**
  Airworthiness
- **Annex 11**
  Air Traffic Services
- **Annex 13**
  Aircraft Accident & Incident Investigation
- **Annex 14**
  Aerodromes



ICAO Annex 19 – Contents

- Foreword
- Chapter 1 - Definitions
- Chapter 2 - Applicability
- Chapter 3 - State Safety Management Responsibilities
- Chapter 4 - Safety Management System
- Chapter 5 - Safety Data Collection, Analysis and Exchange

- Appendix 1 - State Safety Oversight System (8 critical elements of oversight)
- Appendix 2 - Framework for a Safety Management System (SMS): 4 components and 12 elements

- Attachment A - Framework for a State Safety Programme (SSP): 4 components and 11 elements
- Attachment B - Legal Guidance for the Protection of Information from Safety Data Collection and Processing Systems

Status of Annex components

STANDARDS

uniform application is recognised as necessary (differences to be notified to ICAO)

RECOMMENDED PRACTICES

uniform application is recognised as desirable (no need to notify differences to ICAO)

APPENDICES

form part of the Standards and Recommended Practices

ATTACHMENTS

comprise material supplementary to the SARPs, but do not have the value of SARPs (mostly guidance for application)

ICAO Annex 19 – addressee

STATES

SERVICE PROVIDERS

Foreword

Chapter 1 - Definitions

Chapter 2 - Applicability

Chapter 3 - State Safety Management Responsibilities

Chapter 4 - Safety Management System

Chapter 5 - Safety Data Collection, Analysis and Exchange *

Appendix 2 - Framework for a Safety Management System (SMS)

Appendix 1 - State Safety Oversight System

Attachment A - Framework for a State Safety Programme (SSP)

Attachment B - Legal Guidance for the Protection of Information from Safety Data Collection and Processing Systems *

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These provisions, transferred from Annex 13, provide the necessary foundation for the collection, protection, analysis and exchange of safety data to complement the SSP provisions.

ICAO Annex 19 – Applicability

Chapter 2:

- The Standards and Recommended Practices contained in this Annex shall be applicable to **safety management functions related to, or in direct support of, the safe operation of aircraft**.

ICAO Annex 19 – Applicability

Chapter 3 / Chapter 4:

- **approved training organizations** in accordance with Annex 1 that are exposed to safety risks related to aircraft operations during the provision of their services;
- **operators** of aeroplanes or helicopters authorized to conduct international commercial air transport / CAT (Annex 6, Part I or Part III, Section II);
- approved **maintenance organizations** providing services to operators of aeroplanes or helicopters engaged in international CAT (Annex 6, Part I or Part III, Section II);
- organizations responsible for the **type design or manufacture of aircraft**, in accordance with Annex 8;
- **air traffic services** providers in accordance with Annex 11; and
- **operators of certified aerodromes** in accordance with Annex 14.
- **international general aviation operators** of large or turbojet aeroplanes in accordance with Annex 6 Part II Section III.

ICAO Annex 19 – Applicability

International General Aviation

- The SMS of an international general aviation operator, conducting operations of large or turbojet aeroplanes in accordance with Annex 6, Part II, Sec 3, **shall be commensurate with the size and complexity of the operation**.
- Recommendation.— *The SMS should as a minimum include:*
  - *a process to identify actual and potential safety hazards and assess the associated risks;*
  - *a process to develop and implement remedial action necessary to maintain an acceptable level of safety; and*
  - *provision for continuous monitoring and regular assessment of the appropriateness and effectiveness of safety management activities*

SSP/SMS Components

Annex 19 and the EU/EASA System

Annex 19 - further information

ICAO Safety Management website:
http://www.icao.int/safety/SafetyManagement/Pages

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Thank you for your attention!

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