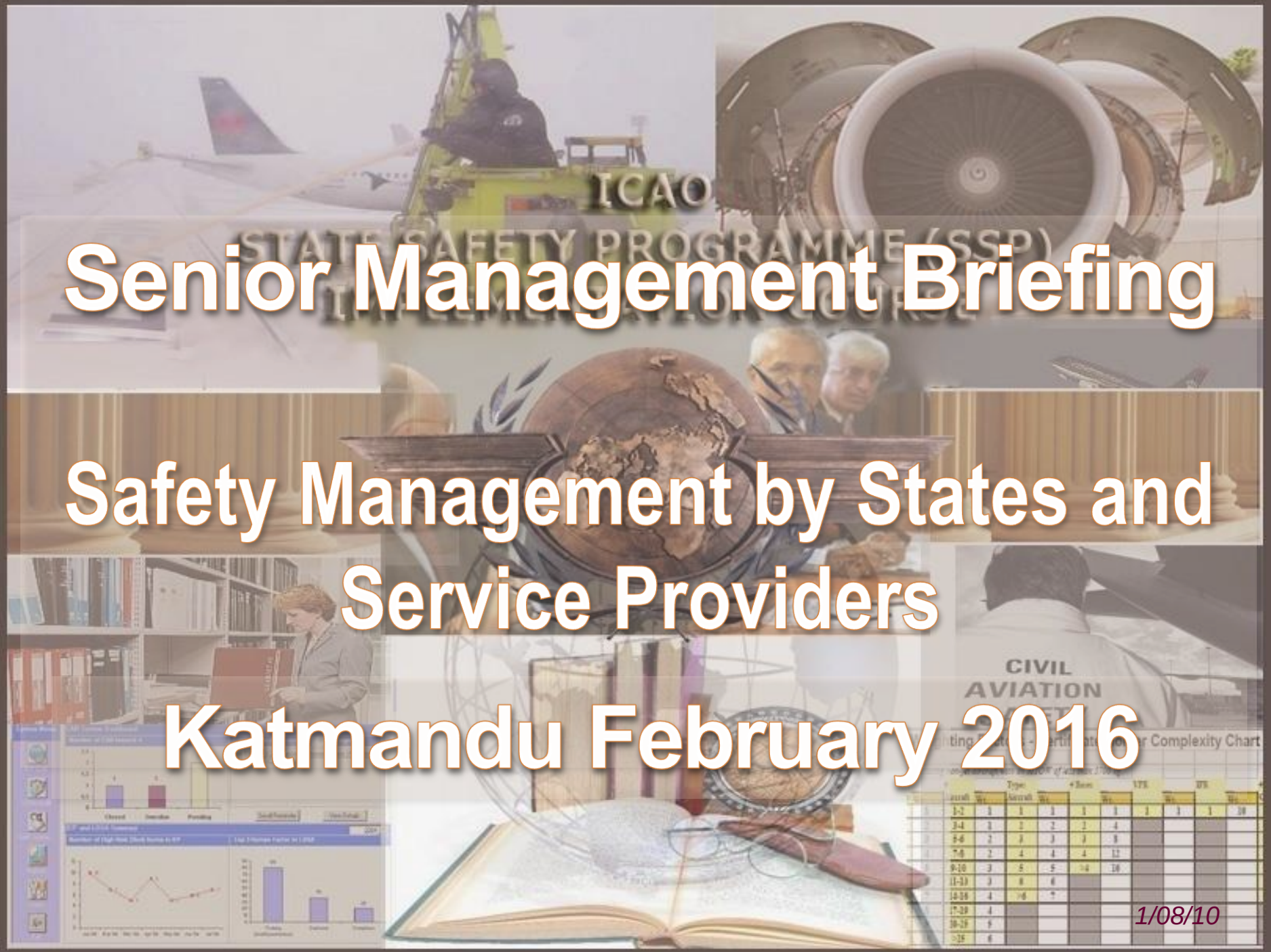


Senior Management Briefing

Safety Management by States and Service Providers

Katmandu February 2016

1/08/10

Production

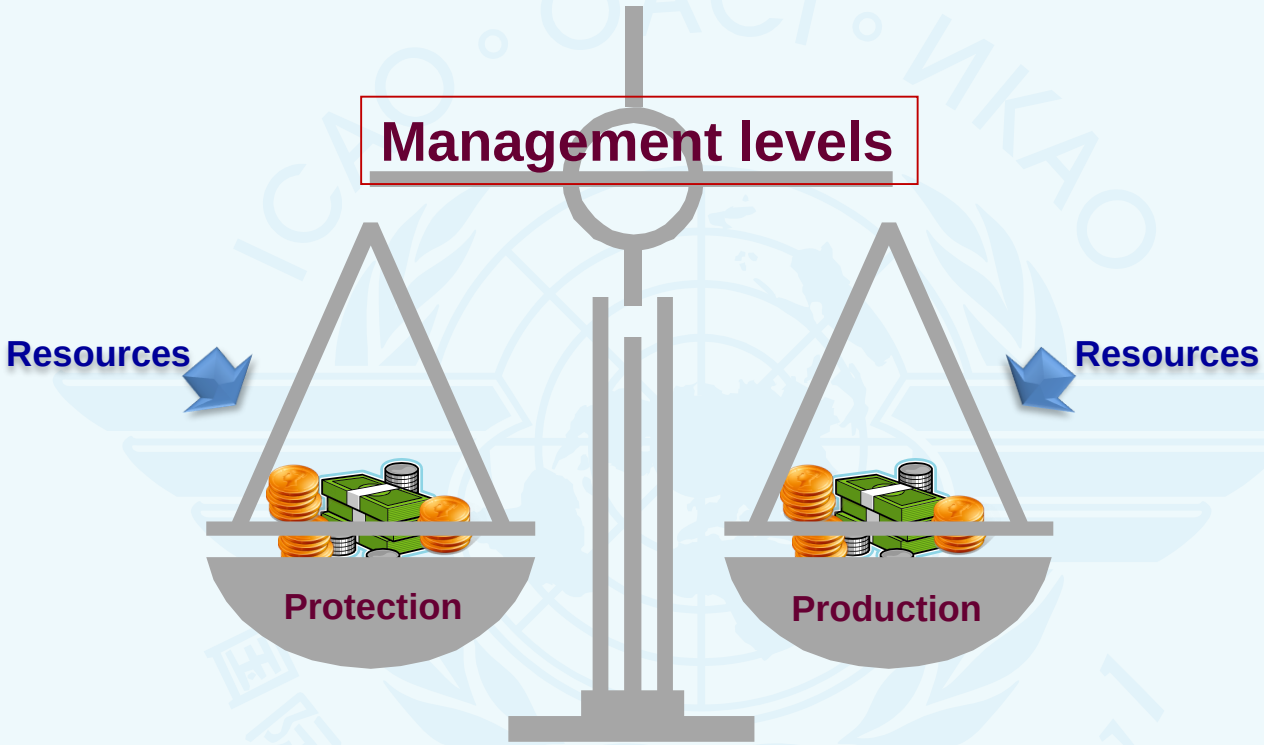
SMS in Action


AIR CANADA

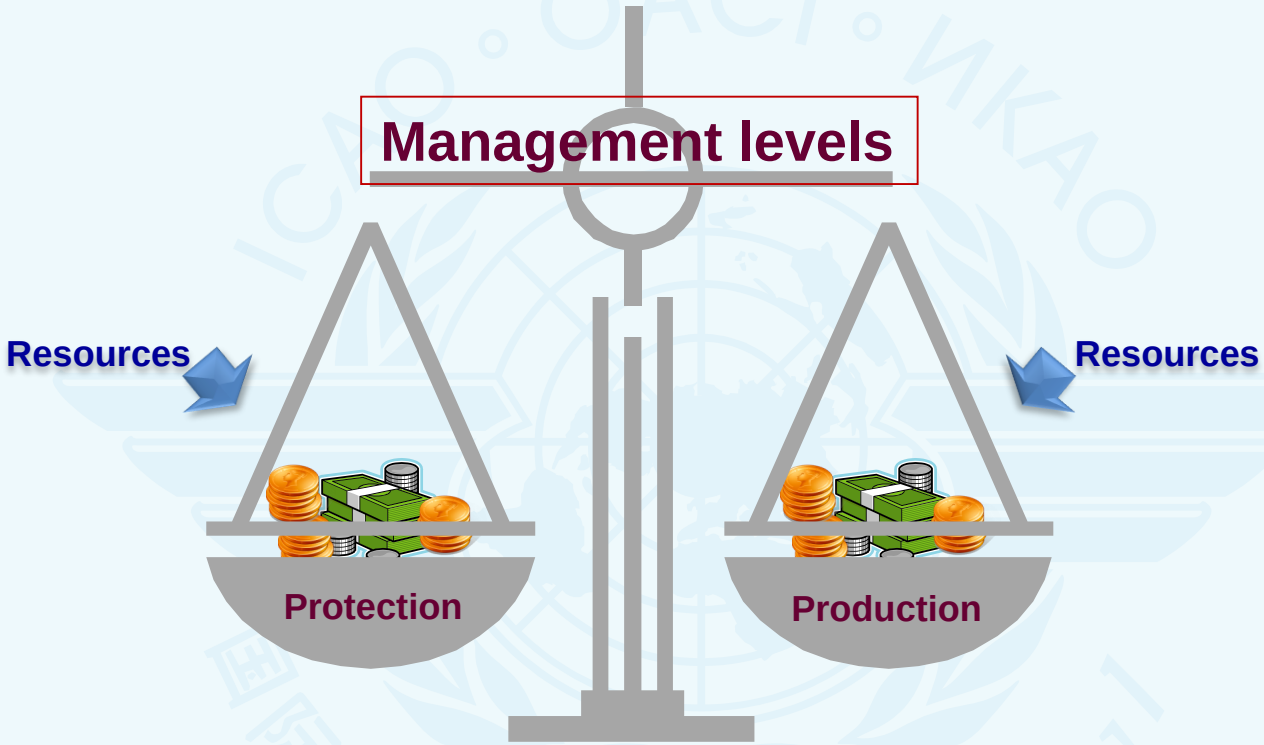
The safety stereotype

What is the fundamental objective of a business organization?

The Management Dilemma



Senior Management-Authority, Responsibility & Delegation



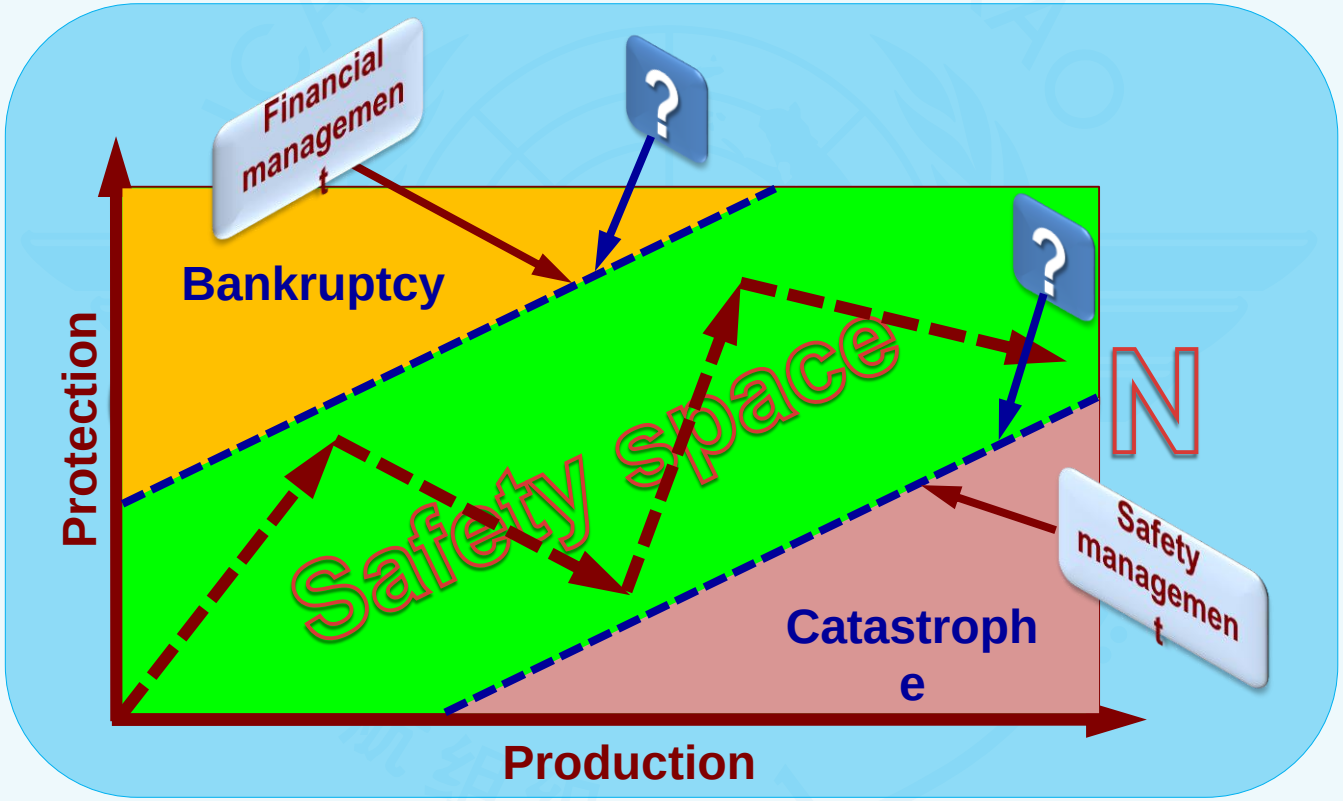
BANKRUPTCY 2000

NO PRODUCTION-BANKRUPTCY 2008

NO PRODUCTION-BANKRUPTCY-EOS B757

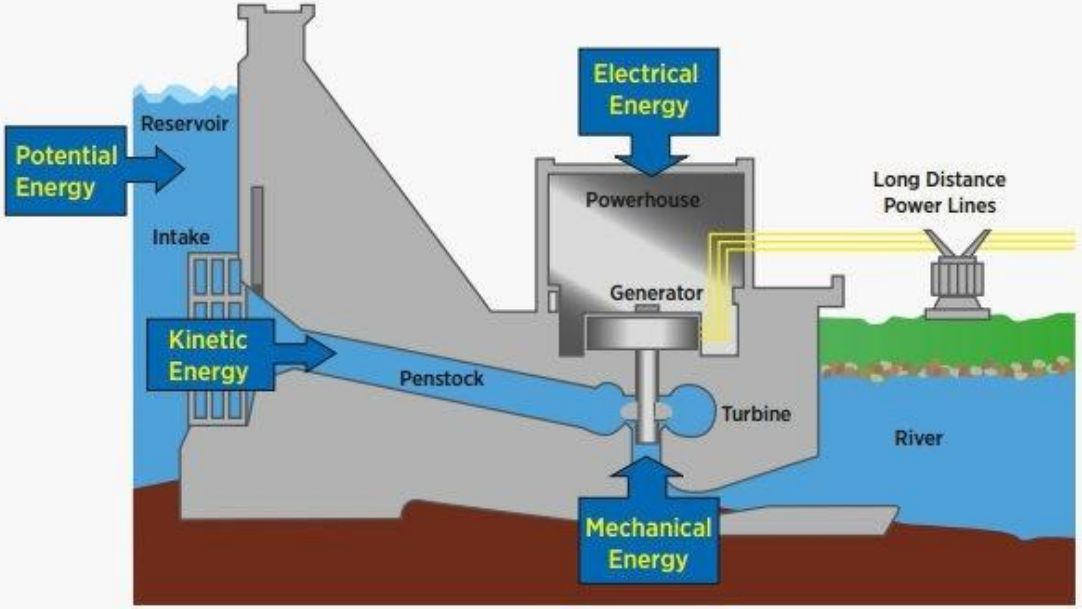
AIR FLORIDA 90-WASHINGTON 1982-CATASTROPHY

Safety Space



SMS-WHAT IS NEEDED?

SMS SYSTEM REQUIREMENTS-DATA



DATA-BUYING, BORROWING, STEALING!

Data Mining-Desert Operations

SAFETY CULTURE REQUIREMENTS

SMS-OBSTACLES TO EFFECTIVE IMPLEMENTATION?

LACK OF REPORTING-WHY?

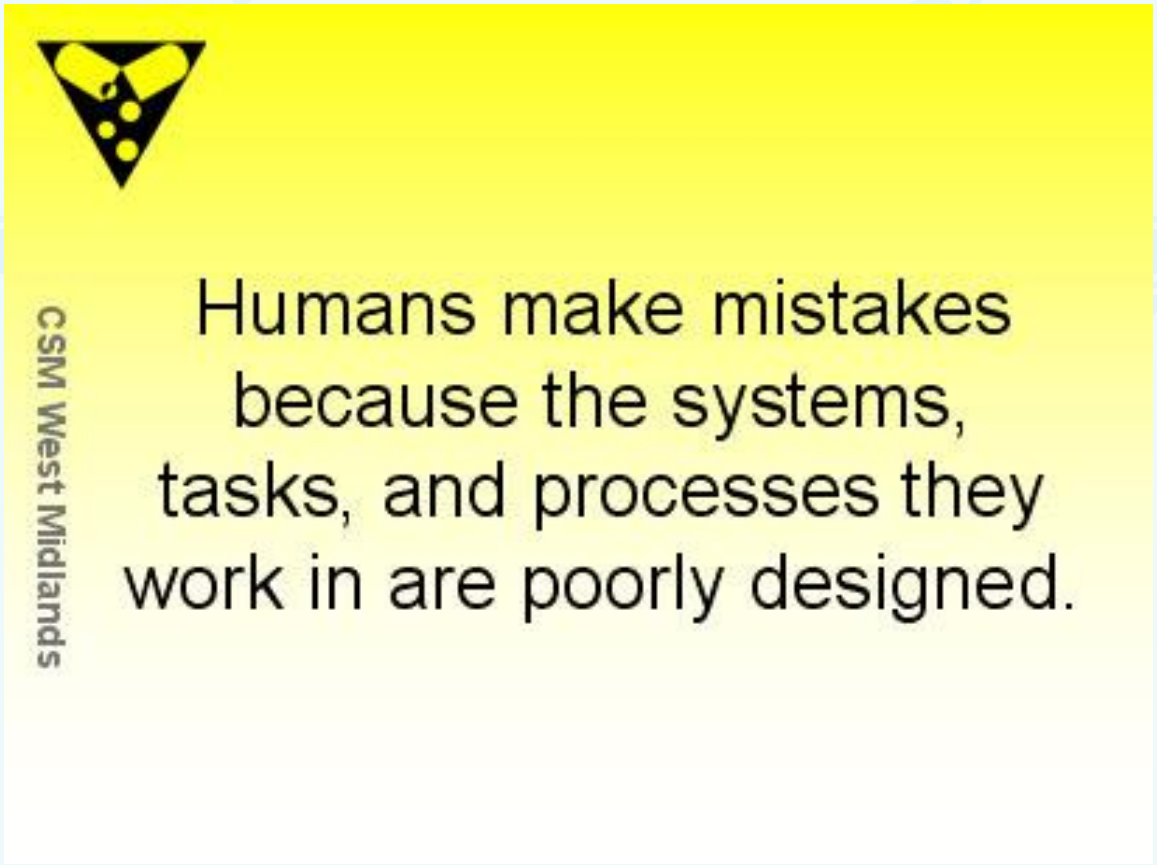
Effective safety reporting – Five basic traits

Just Culture-Obstacle to Effective SMS

A just culture is one in which personnel feel free to report errors and conditions – even their own errors – without fear of the bounce back upon themselves or their coworkers.

Maintenance Reporting?

BLAME-A ROLE IN RISK MANGEMENT?



Will this crew do it again?

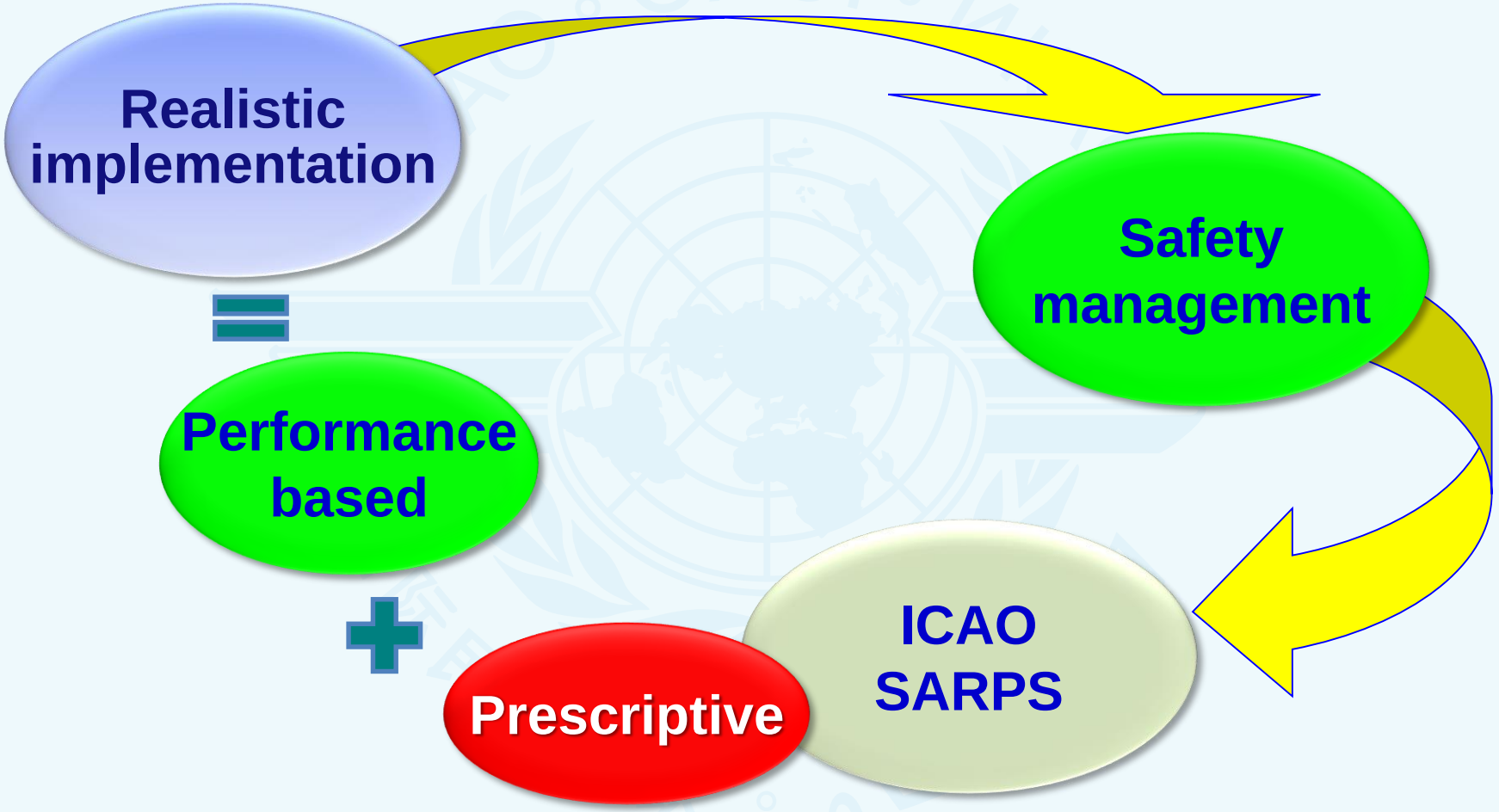
Objectives

- To introduce the senior management to the concepts and principles underlying the management of safety by States and service providers
- To explain the safety management SARPS related to the State Safety Programme (SSP) and Safety Management Systems (SMS)
- To describe the ICAO SMS and SSP framework, its components and elements as the means to implement the SSP and explain the role of the SSP in supporting the implementation of SMS by service providers

Contents

- Part I - Basic safety management concepts
- Part II - Hazard identification and risk management
- Part III - Safety management requirements
- Part IV - Introduction to Safety Management Systems (SMS)
- Part V - Introduction to State Safety Programme (SSP)

An essential concept



Part I – Basic safety management concepts

To start.....

Consider

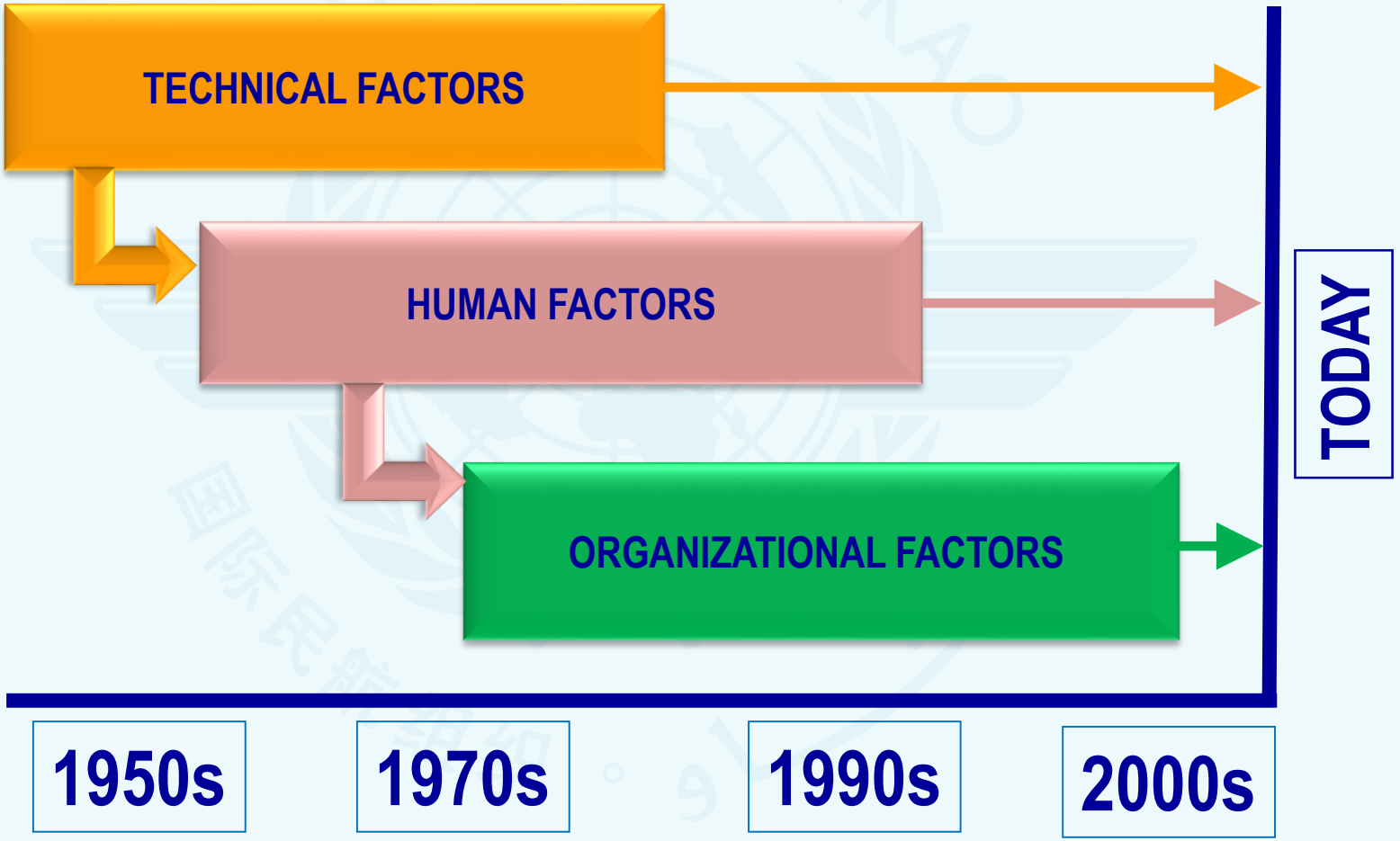
- The elimination of accidents (and serious incidents) is unachievable
- Failures will occur, in spite of the most accomplished prevention efforts
- No human activity or human-made system can be guaranteed to be absolutely free from hazard and operational errors
- Controlled safety risk and controlled error are acceptable in an inherently safe system

Before safety management

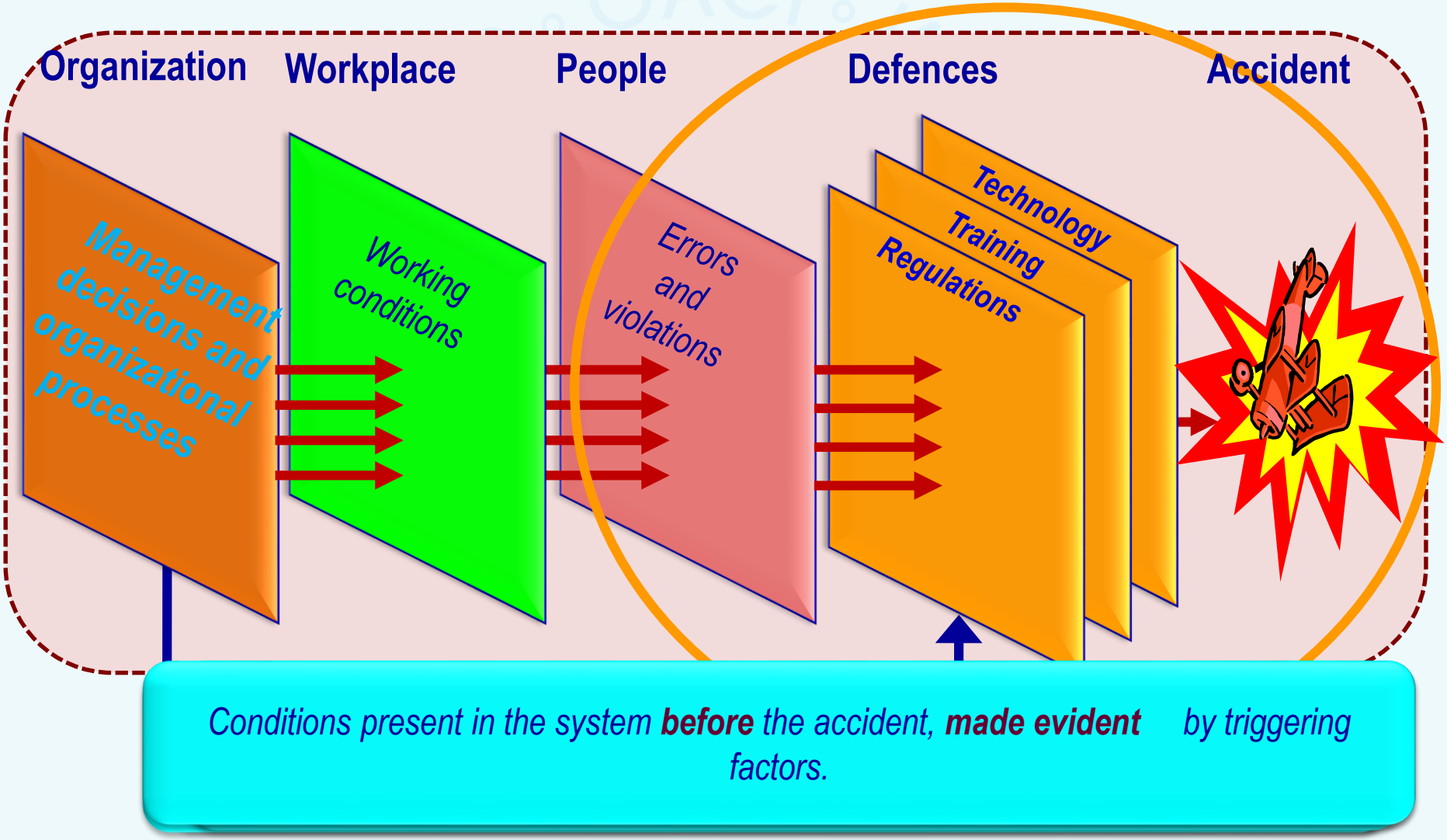
Traditional approach

- **Preventing accidents**
  - **Accident investigation - Focus on outcomes (causes)**
- **Regulatory compliance**

The evolution of safety thinking



A concept of accident causation



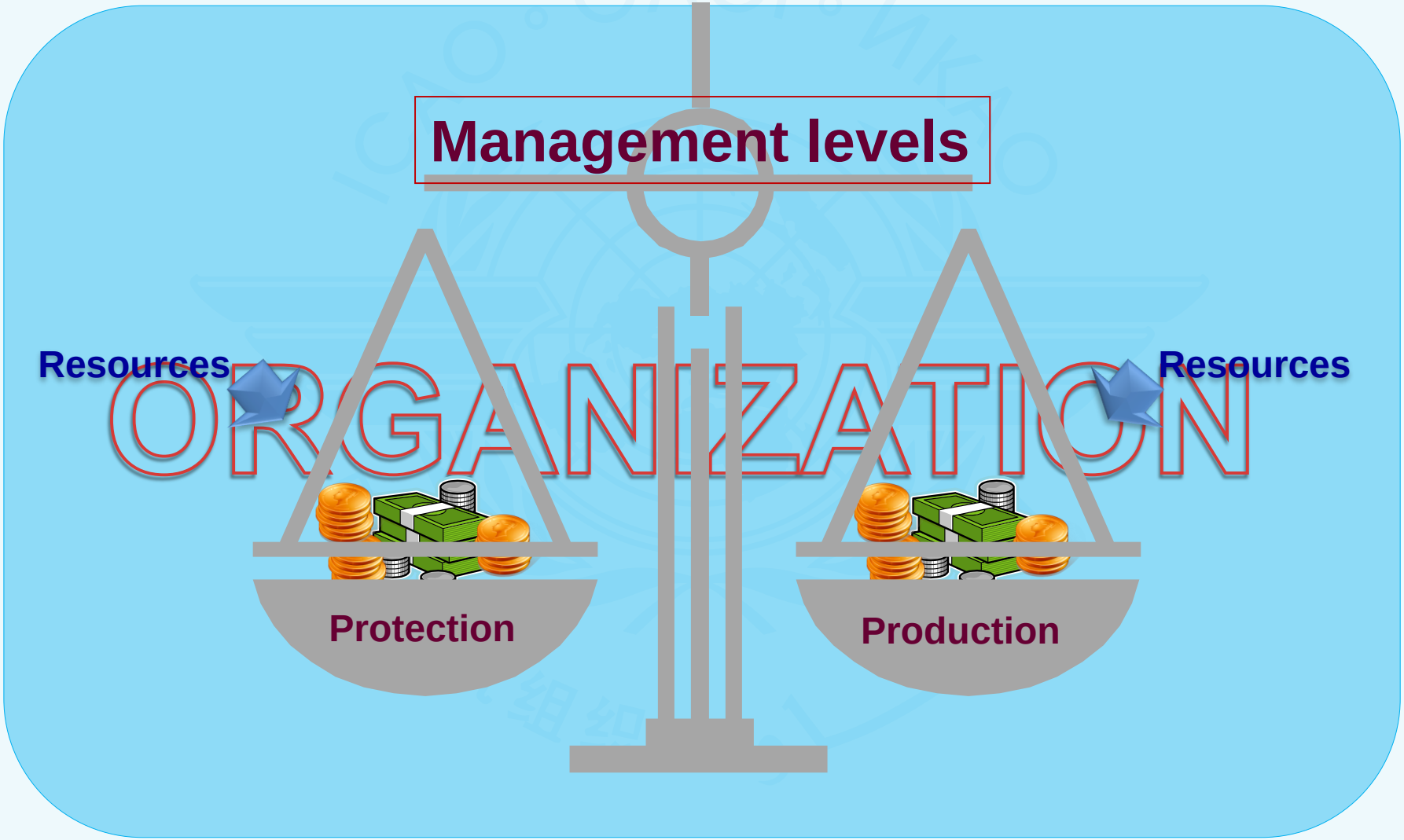
The safety stereotype

What is the fundamental objective of a business organization?

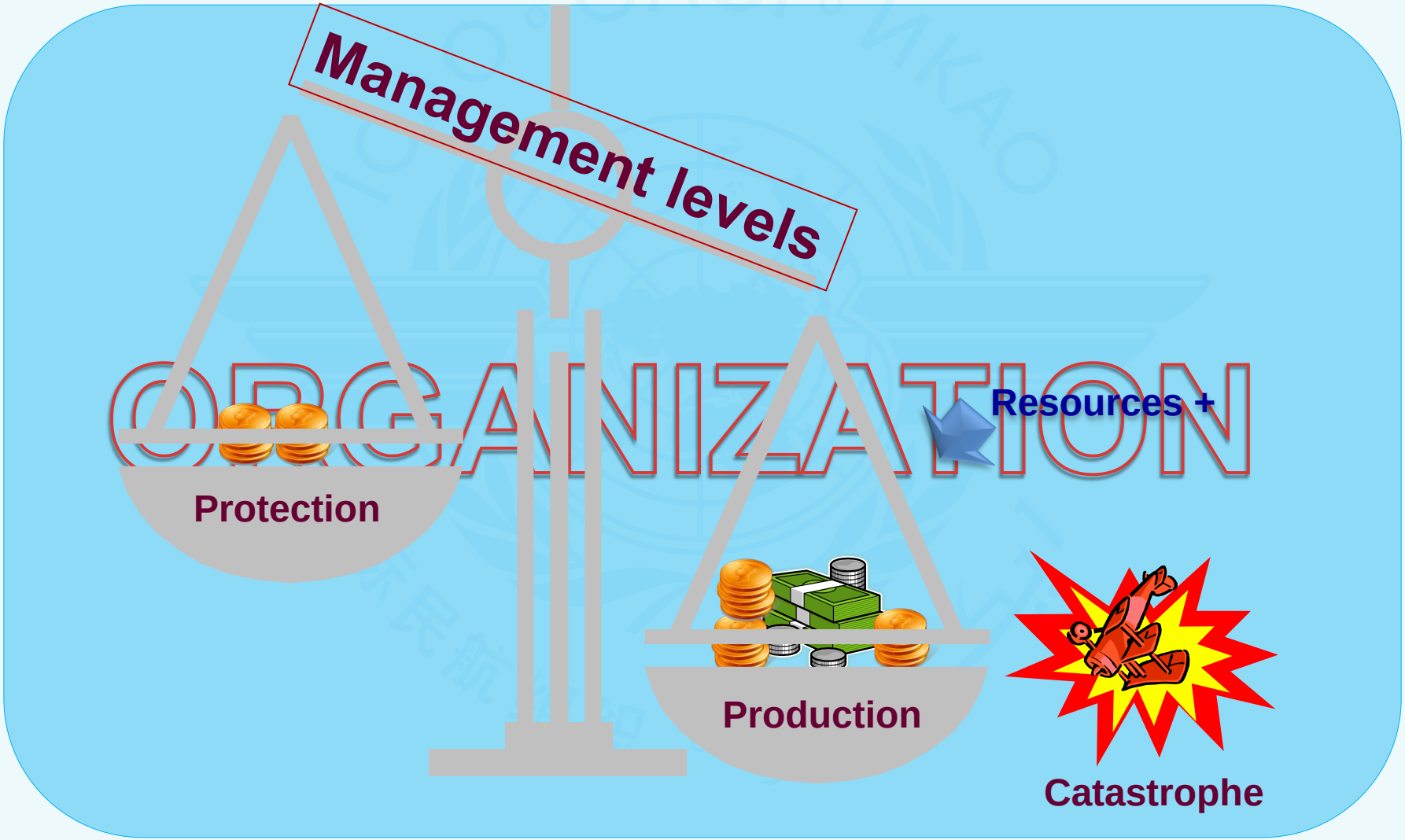
R: To achieve its production objectives

- Provision of services require a constant balance between:
- Production goals (maintaining regular aerodrome operations during a runway construction project)
- Safety goals (maintaining existing margins of safety in aerodrome operations during runway construction project)
- An analysis of an organization's resources and goals allows for a balanced and realistic allocation of resources between protection and production goals, which supports the needs of the organization

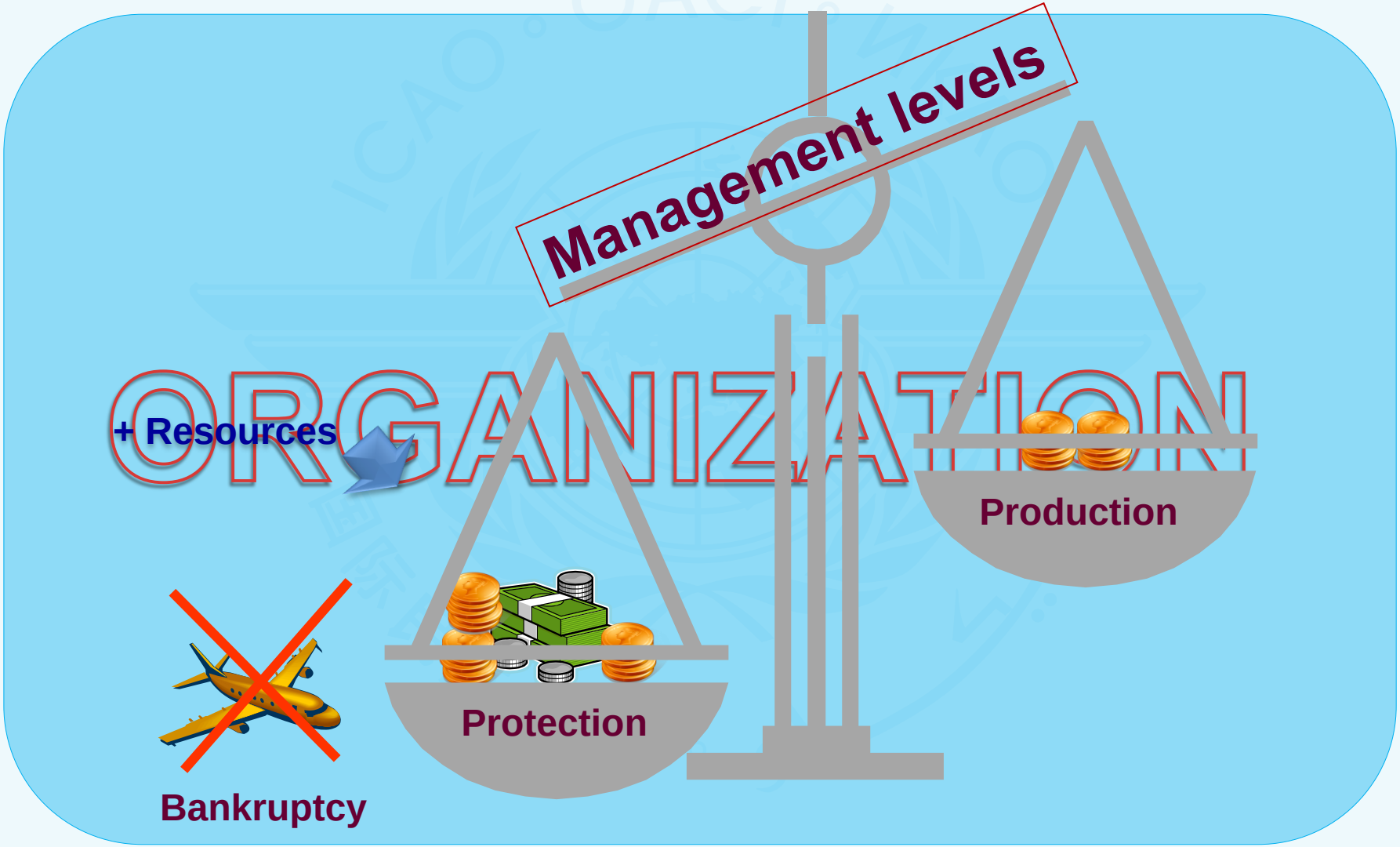
The management dilemma



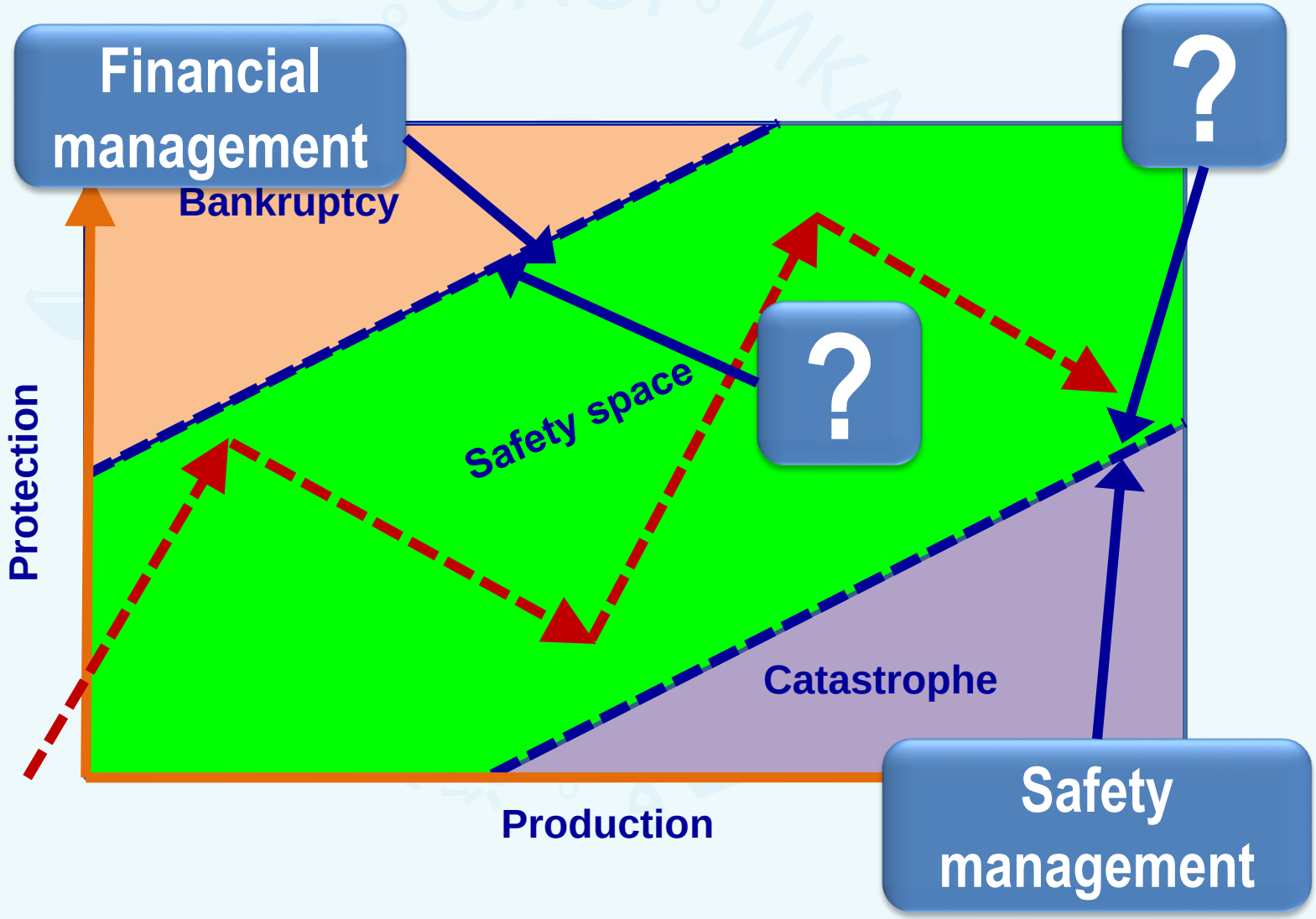
The management dilemma



The management dilemma



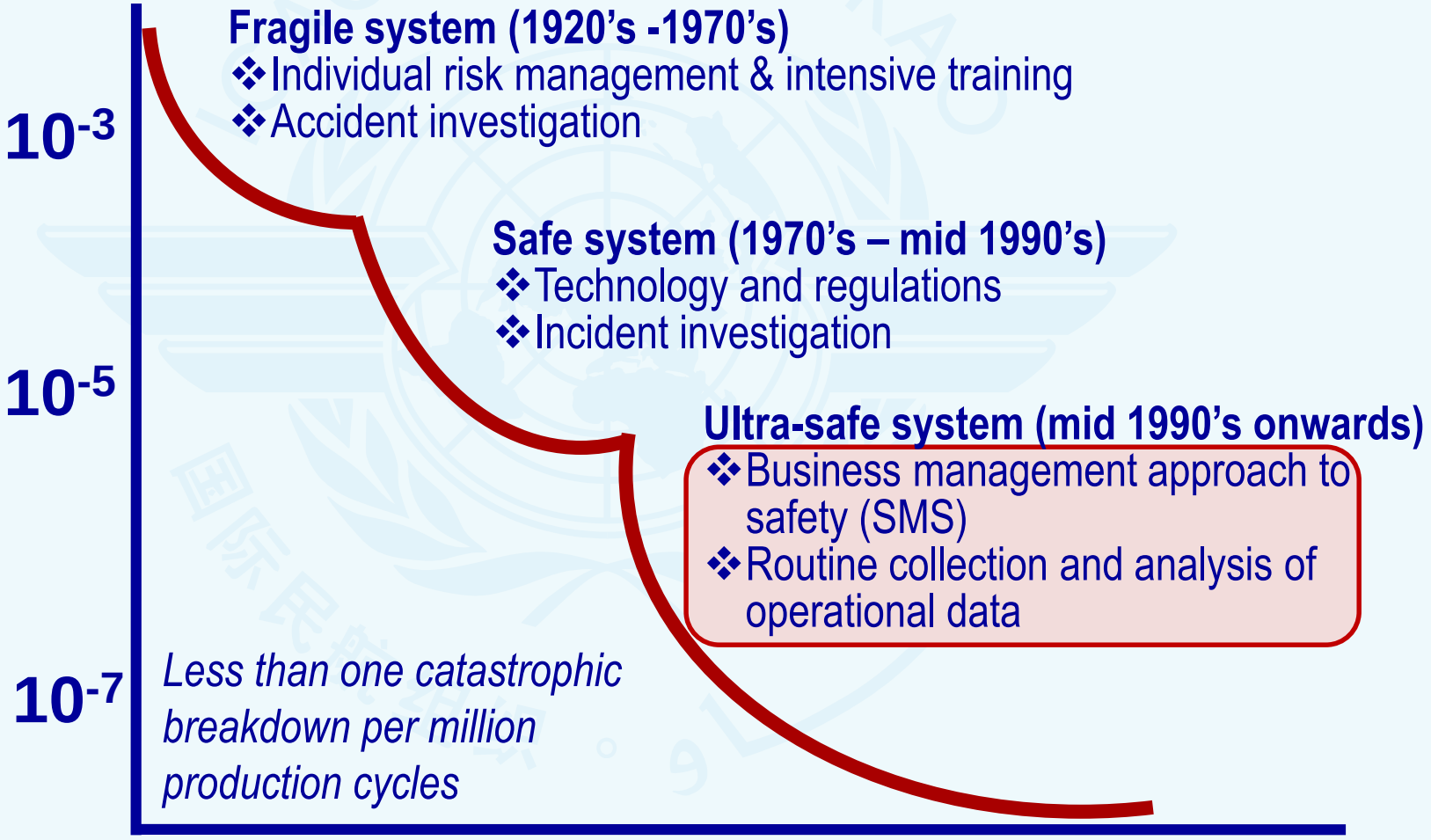
Safety space



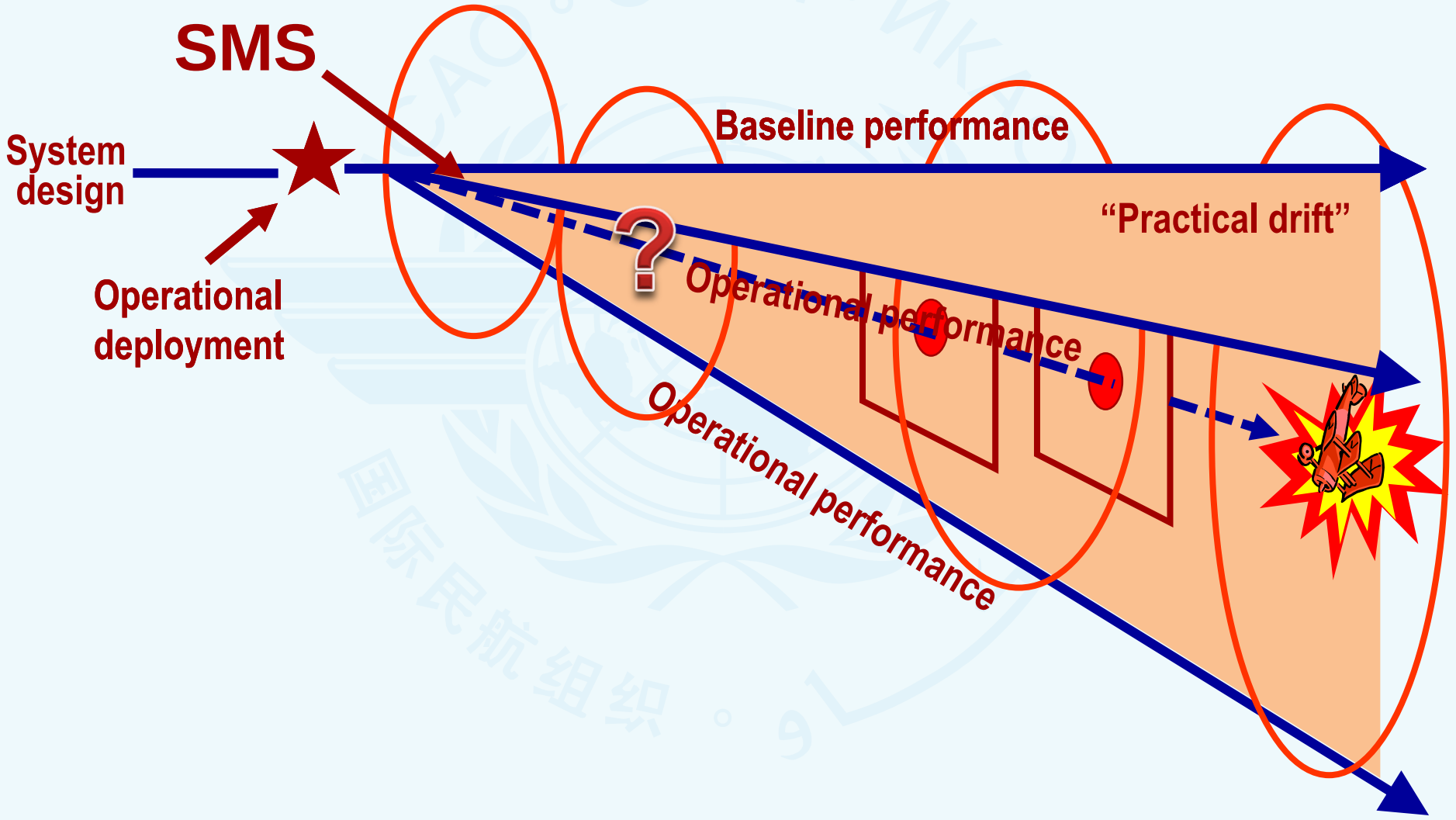
Concept of safety (Doc 9859)

- **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**

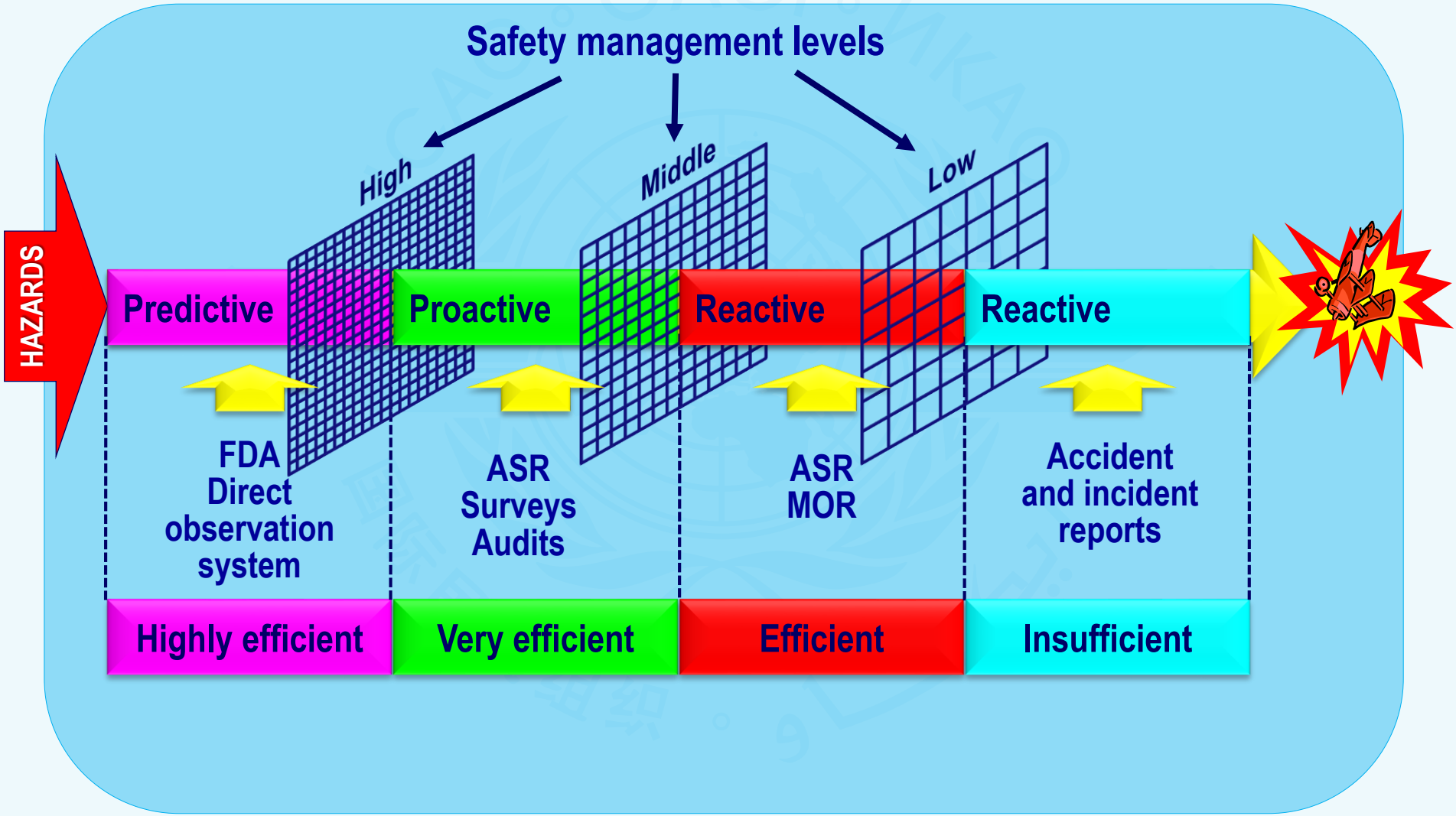
Why SM? – The first ultra-safe industrial system



Why SM? An imperfect system



Strategies – Levels of intervention and tools



Three possible organizational cultures

Regarding the management of information

	Pathological	Bureaucratic	Generative
Information	Hidden	Ignored	Sought
Messengers	Shouted	Tolerated	Trained
Responsibilities	Shirked	Boxed	Shared
Reports	Discouraged	Allowed	Rewarded
Failures	Covered up	Merciful	Scrutinized
New ideas	Crushed	Problematic	Welcomed
Resulting organization	Conflicted organization	"Red tape" organization	Reliable organization

Part II – Hazard identification and risk management

Three key definitions

- **Hazard** – Condition or object with the potential of causing injuries to personnel, damage to equipment or structures, loss of material, or reduction of ability to perform a prescribed function

- **Consequence** – Potential outcome(s) of the hazard

- **Safety Risk** – The assessment, expressed in terms of predicted probability and severity, of the consequence(s) of a hazard taking as reference the worst foreseeable situation

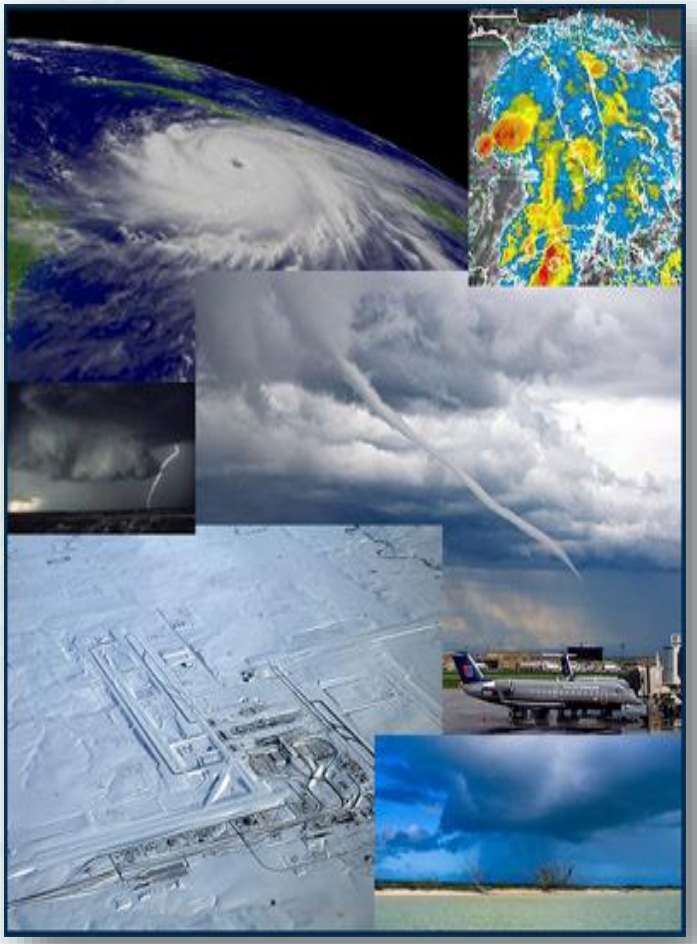
Three key definitions

➢ **Example**

- **Unclear aerodrome signage is a hazard**
- **A runway incursion is one of the consequences of the hazard**
- **The assessment (quantification) of the consequences of the potential runway incursion expressed in terms of probability and severity is the safety risk**

Examples of natural hazards

- Severe weather or climatic events:
  - ***E.g.: hurricanes, major winter storms, tornadoes and wind shear.***
- Geophysical events:
  - ***E.g.: earthquakes, volcanoes, tsunamis, floods and landslides.***
- Geographical conditions:
  - ***E.g.: adverse terrain or large bodies of water.***
- Environmental events:
  - ***E.g.: wildfires, wildlife activity, and insect or pest infestation.***

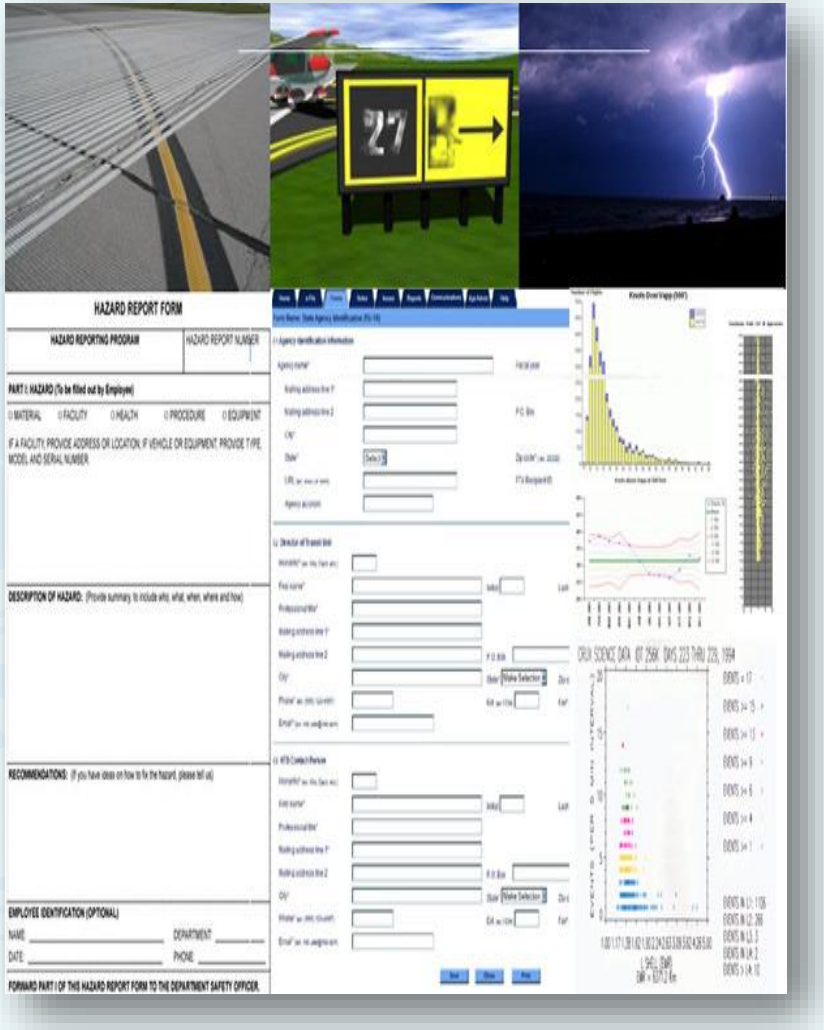


Examples of technical and economics hazards

- Major trends related to:
  - **Growth.**
  - **Recession.**
  - **Cost of material or equipment.**
  - **Etc.**
- Deficiencies regarding:
  - ***E.g.: aircraft and aircraft components, systems, subsystems and related equipment.***

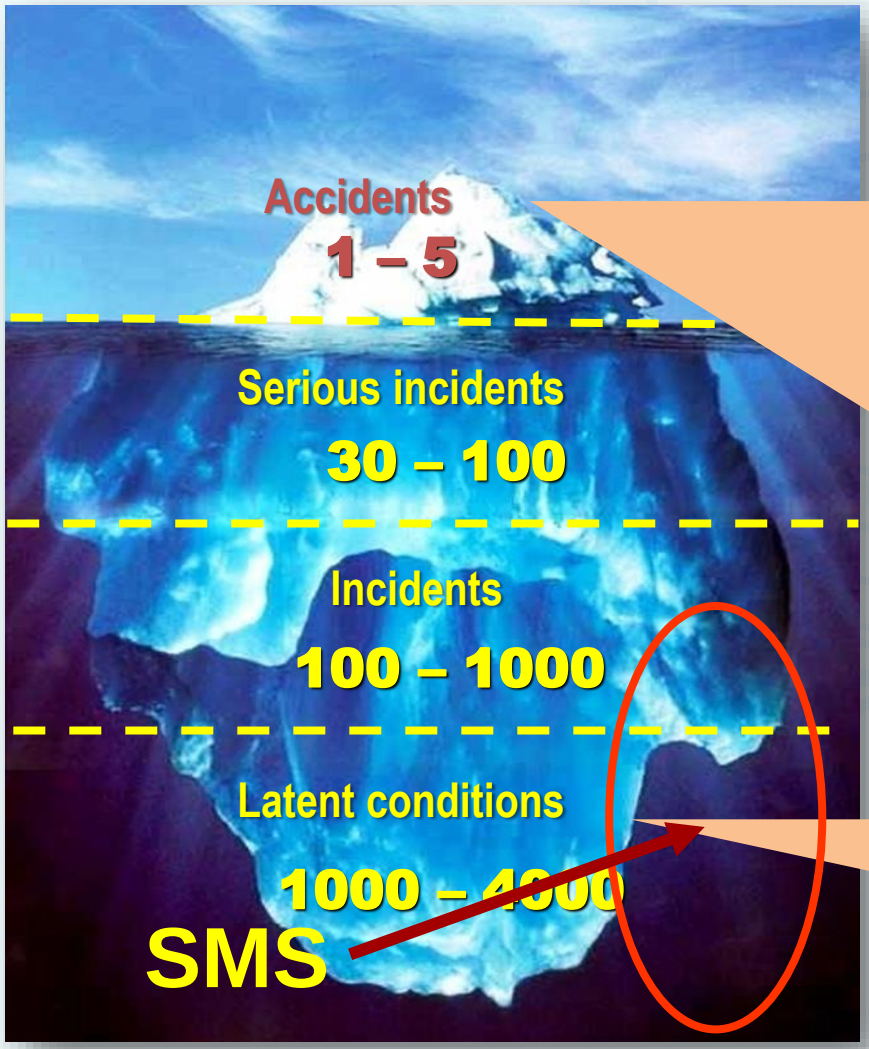
Sources of hazard identification

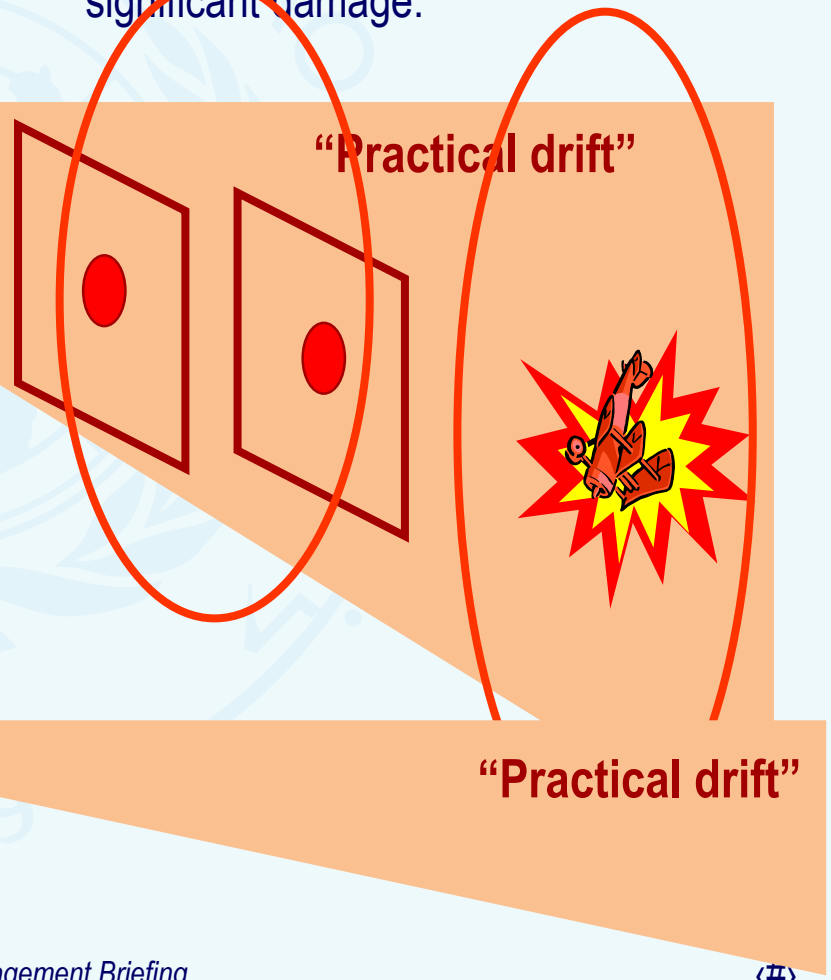
- External
  - Accident reports
  - State mandatory occurrence system
- As a reminder
  - Predictive
  - Proactive
  - Reactive
- Internal
  - Flight Data Analysis
  - Company voluntary reporting system
  - Audits and surveys



The focus of hazard identification

- Hazard identification is a wasted effort if restricted to the aftermath of rare occurrences where there is serious injury, or significant damage.

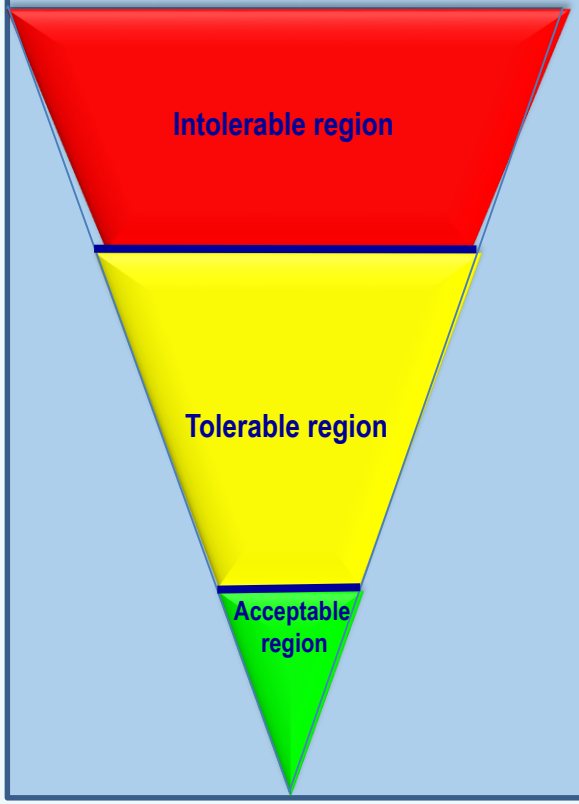




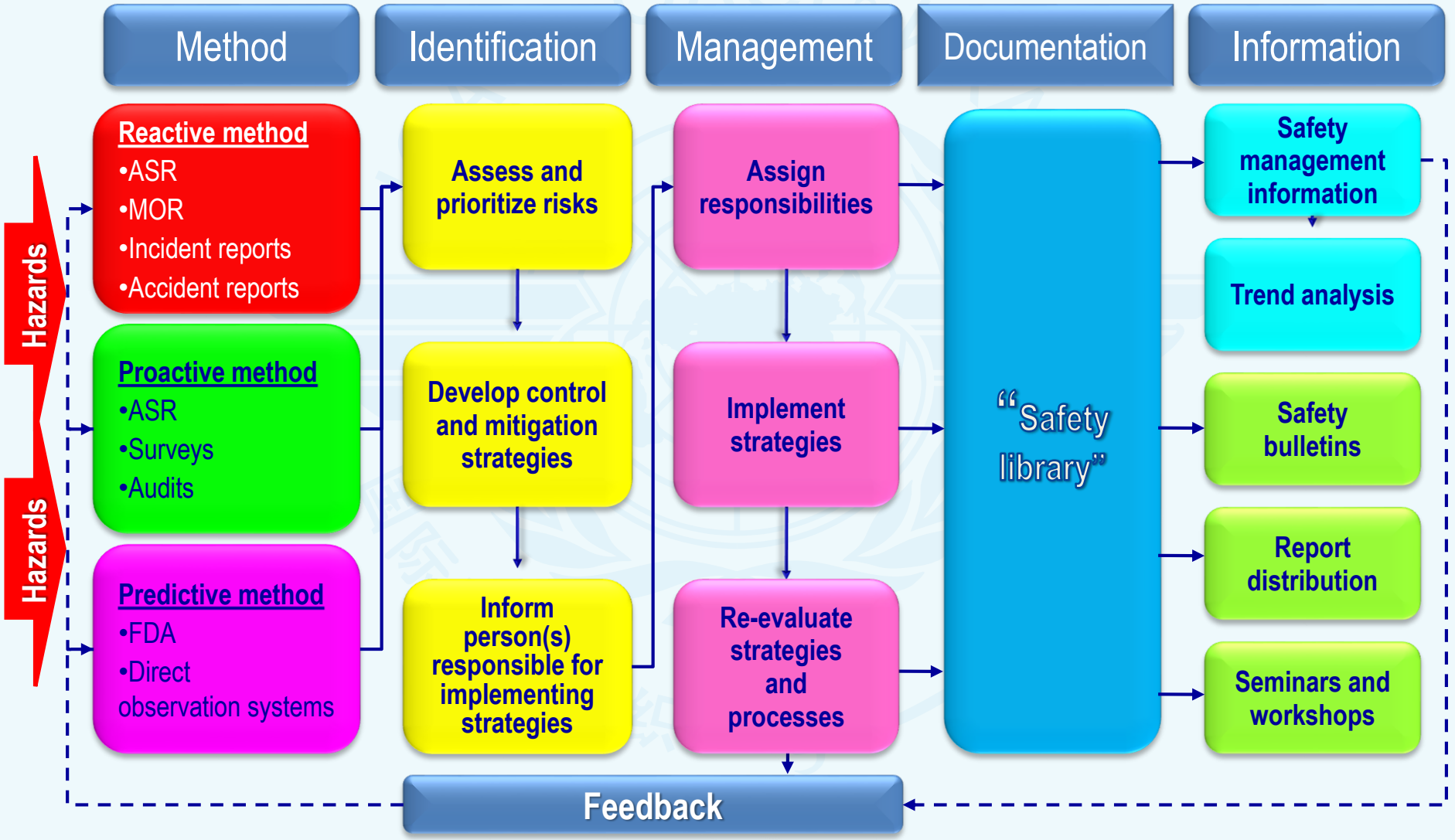
Risk assessment

Risk probability		Risk severity				
		Catastrophic A	Hazardous B	Major C	Minor D	Negligible E
Frequent	5	5A	5B	5C	5D	5E
Occasional	4	4A	4B	4C	4D	4E
Remote	3	3A	3B	3C	3D	3E
Improbable	2	2A	2B	2C	2D	2E
Extremely improbable	1	1A	1B	1C	1D	1E

Risk tolerability

Risk management	Assessment risk index	Suggested criteria
	5A, 5B, 5C, 4A, 4B, 3A	Unacceptable under the existing circumstances
	5D, 5E, 4C, 4D, 4E, 3B, 3C, 3D, 2A, 2B, 2C	Acceptable based on risk mitigation. It might require management decision
	3E, 2D, 2E, 1A, 1B ,1C, 1D, 1E	Acceptable

Connecting processes



Part II – Safety management requirements

ICAO safety management SARPs – The big picture

- **Two audience groups**
  - States
  - Service providers
- **Three distinct requirements**
  - State safety programme (SSP)
    - ✓Acceptable level of safety (ALoS)
  - Safety management System (SMS)
    - ✓Safety performance of the SMS
  - Management accountability

INTERNATIONAL STANDARDS
AND RECOMMENDED PRACTICES

AIRWORTHINESS OF AIRCRAFT

ANNEX 8
TO THE CONVENTION ON INTERNATIONAL AVIATION

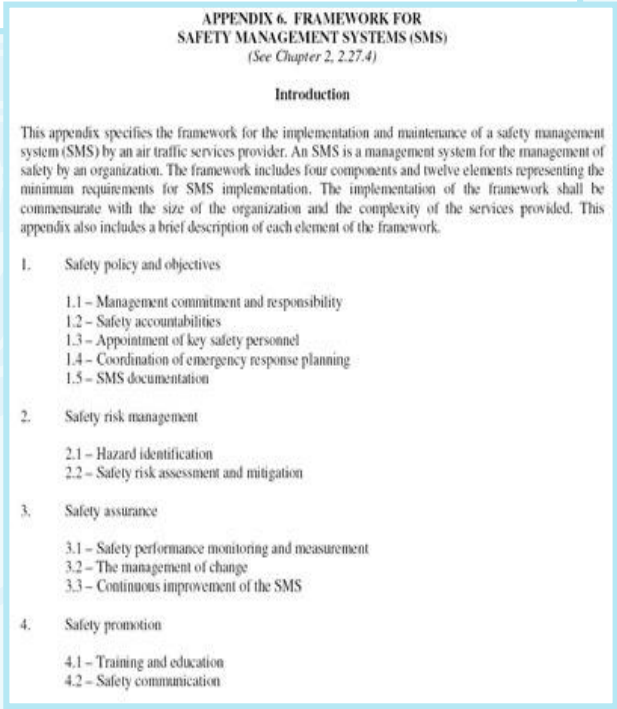
PART I – DEFINITIONS

...

***Safety management system**. A systematic approach to managing safety, including the necessary organizational structures, accountabilities, policies and procedures.*

***State safety programme**. An integrated set of regulations and activities aimed at improving safety.*

...



APPENDIX 6. FRAMEWORK FOR
SAFETY MANAGEMENT SYSTEMS (SMS)
(See Chapter 2, 2.27.4)

Introduction

This appendix specifies the framework for the implementation and maintenance of a safety management system (SMS) by an air traffic services provider. An SMS is a management system for the management of safety by an organization. The framework includes four components and twelve elements representing the minimum requirements for SMS implementation. The implementation of the framework shall be commensurate with the size of the organization and the complexity of the services provided. This appendix also includes a brief description of each element of the framework.

1. Safety policy and objectives
   - 1.1 – Management commitment and responsibility
   - 1.2 – Safety accountabilities
   - 1.3 – Appointment of key safety personnel
   - 1.4 – Coordination of emergency response planning
   - 1.5 – SMS documentation
2. Safety risk management
   - 2.1 – Hazard identification
   - 2.2 – Safety risk assessment and mitigation
3. Safety assurance
   - 3.1 – Safety performance monitoring and measurement
   - 3.2 – The management of change
   - 3.3 – Continuous improvement of the SMS
4. Safety promotion
   - 4.1 – Training and education
   - 4.2 – Safety communication

Basic safety management SARPs – Part I

- *States shall establish a **State safety programme (SSP)**, in order to achieve an acceptable level of safety (ALoS) in civil aviation*

- What is an SSP? - An integrated set of regulations and activities aimed at improving safety

- An SSP is a management system for the management of safety by the State

Basic safety management SARPs – Part II

- *States shall require, as part of their State safety programme (SSP), that a [service provider] implement a **safety management system (SMS)** acceptable to the State that, as a minimum:*
  - *a) identifies safety hazards;*
  - *b) ensures the implementation of remedial action necessary to maintain agreed safety performance*
  - *c) provides for continuous monitoring and regular assessment of the safety performance; and*
  - *d) aims at a continuous improvement of the overall performance of the safety management system*

Service providers

- The following service providers are required to implement ICAO SARPs on SMS:
  1. Approved training organizations that are exposed to safety risks during the provision of their services
  2. Aircraft operators
  3. Approved maintenance organizations
  4. Organizations responsible for design and/or manufacture of aircraft
  5. Air traffic services providers
  6. Certified aerodromes

Basic safety management SARPs – Part III

- *A safety management system (SMS) shall clearly define lines of safety accountability throughout a service provider organization, including a direct accountability for safety on the part of senior management*

Part IV - Introduction to Safety Management Systems (SMS)

What is an SMS?

- *A systematic approach to managing safety, including the necessary organizational structures, accountabilities, policies and procedures*
- Service providers are responsible for establishing an SMS
- States are responsible, under the SSP, for the acceptance and oversight of service providers' SMS

What is an SMS?

➢ A toolbox

- The scope of SMS encompasses most of the activities of the organization.
- SMS must start from senior management, and safety must be considered at all levels of the organization.
- SMS aims to make continuous improvement to the overall level of safety.

ICAO SMS framework

1. Safety policy and objectives
   - 1.1 – Safety policy
   - 1.2 – Management commitment and safety accountabilities
   - 1.3 – Appointment of key safety personnel
   - 1.4 – Coordination of emergency response planning
   - 1.5 – SMS documentation
2. Safety risk management
   - 2.1 – Hazard identification
   - 2.2 – Risk assessment and mitigation
3. Safety assurance
   - 3.1 – Safety performance monitoring and measurement
   - 3.2 – The management of change
   - 3.3 – Continuous improvement of the SMS
4. Safety promotion
   - 4.1 – Training and education
   - 4.2 – Safety communication

SMS (Safety performance measurement)

Values of safety targets	1. *[Reduce by/maximum]* non-conforming approaches (NCA) at 5 international airports per *[number]* arrivals by *[date]* 2. *[Reduce by/maximum]* Cat B and C runway incursions in 5 international *[State]* airports per *[number]* by *[date]* 3. …
Action plans	1. Constant Descend Arrivals (CDA) procedures implemented – Arrival procedures charts designed for stabilized approaches 2. Installation of ASDE/X in 5 international [State] airports 3. ….
Values of safety indicators	1. *[Number]* non-conforming approaches (NCA) at 5 international airports *[State]* per [*number]* operations 2. *[Number] of* Cat B and C runway incursions in 5 international airports *[State]* per *[number]* operations 3. …
State	**Will comply all applicable international standards**

Performance-based regulatory environment

- The notion of safety performance is an essential ingredient of the effective operation of an SMS.
- It serves for developing a performance-based regulatory environment, in order to monitor the actual performance of an SMS.
- At the same time, it is also important to remember the management axiom that “one cannot manage what one cannot measure”.

Part V - Introduction to State Safety Programme (SSP)

SSP development

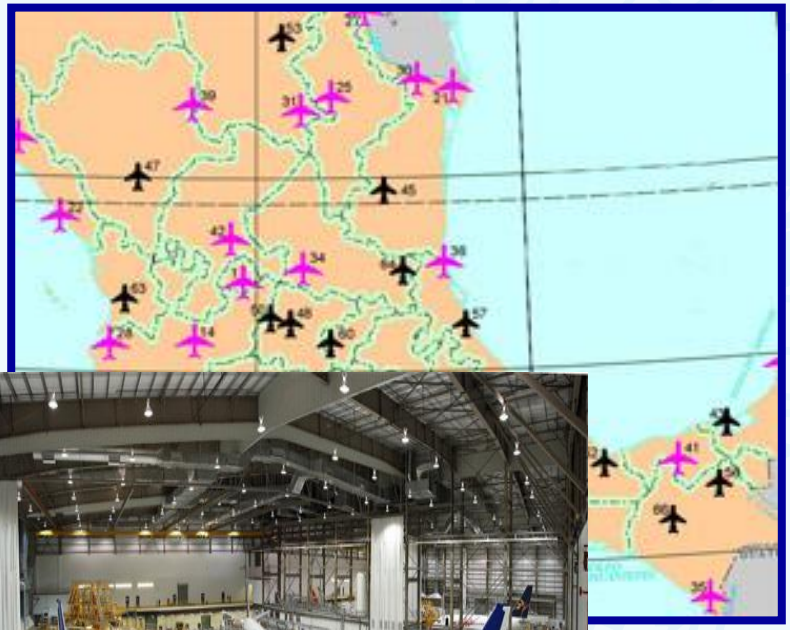
- SSP development is based upon basic safety management principles (SRM and SA)
- SSP is the bridge that closes the gap between the internal and external safety processes of a State and the internal safety processes of service providers

Two fundamental principles

- The State Safety Programme (SSP) provides:
  - a platform for States to apply safety management principles, such as safety risk management (SRM) and safety assurance (SA), to the discharge of their safety responsibilities
  - a structural framework that allows the State safety oversight authority and service providers to interact more effectively in the resolution of safety concerns
- The SSP is also the enabler for the application of safety management principles across the different State civil aviation organizations

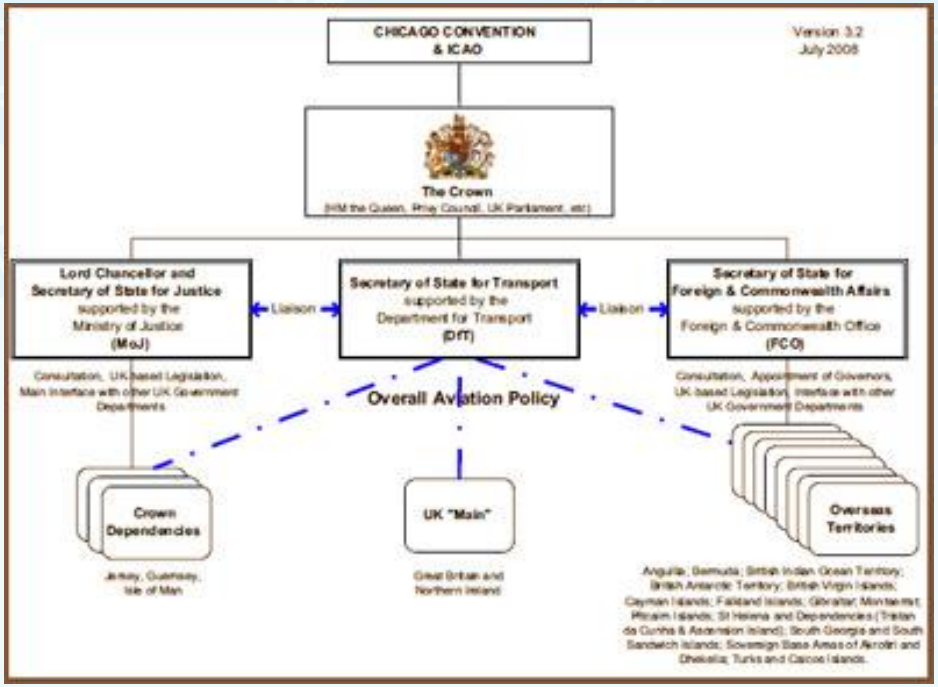
SSP in context

- The implementation of an SSP must be commensurate with the size and complexity of the State's aviation system



SSP in context

- The implementation of an SSP may require coordination among multiples authorities responsible for individual element functions in the State



SSP and SMS components

SSP components

1. State safety policy and objectives
2. State safety risk management
3. State safety assurance
4. State safety promotion

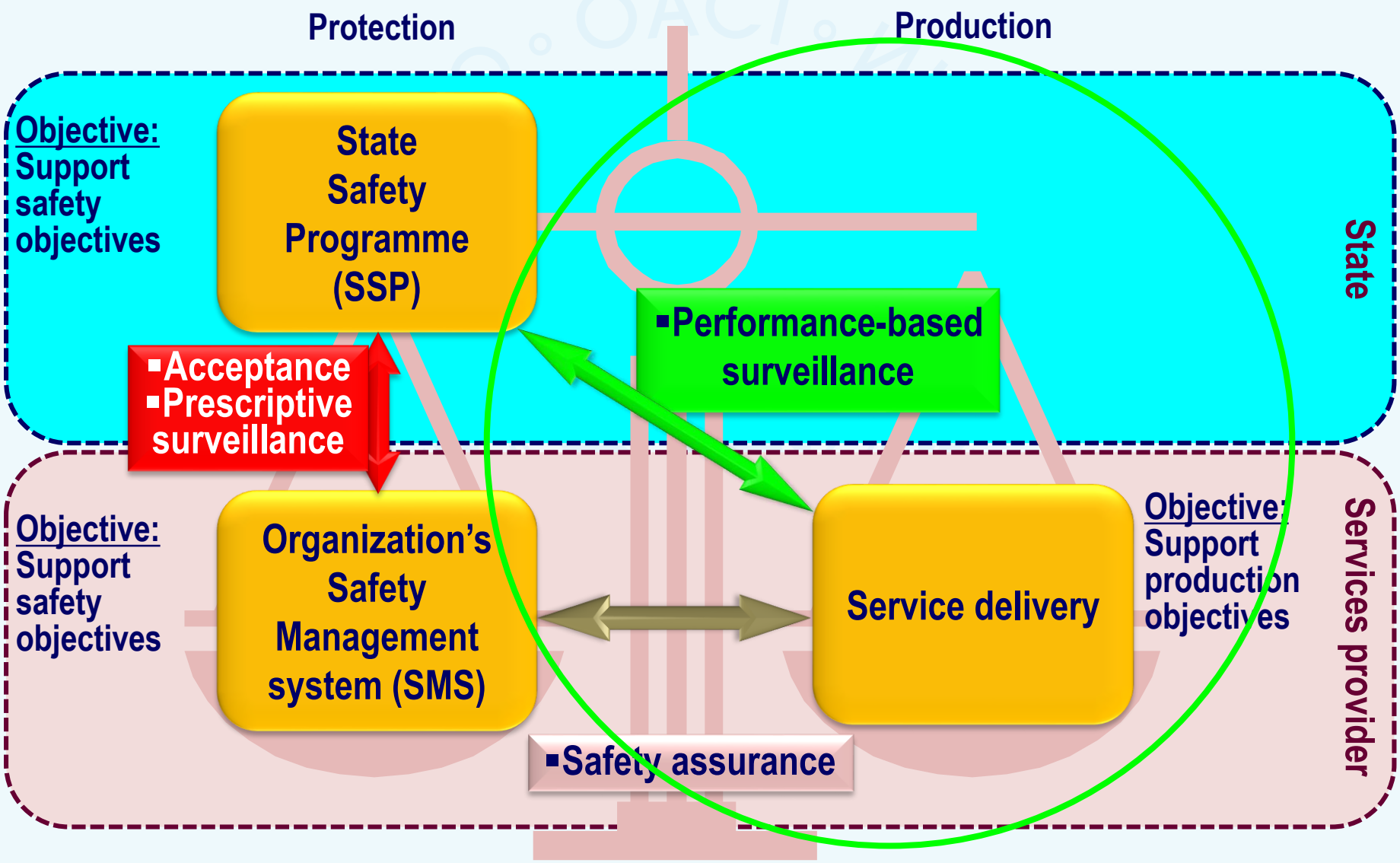
SMS components

1. Safety policy and objectives
2. Safety risk management
3. Safety assurance
4. Safety promotion

ICAO SSP framework

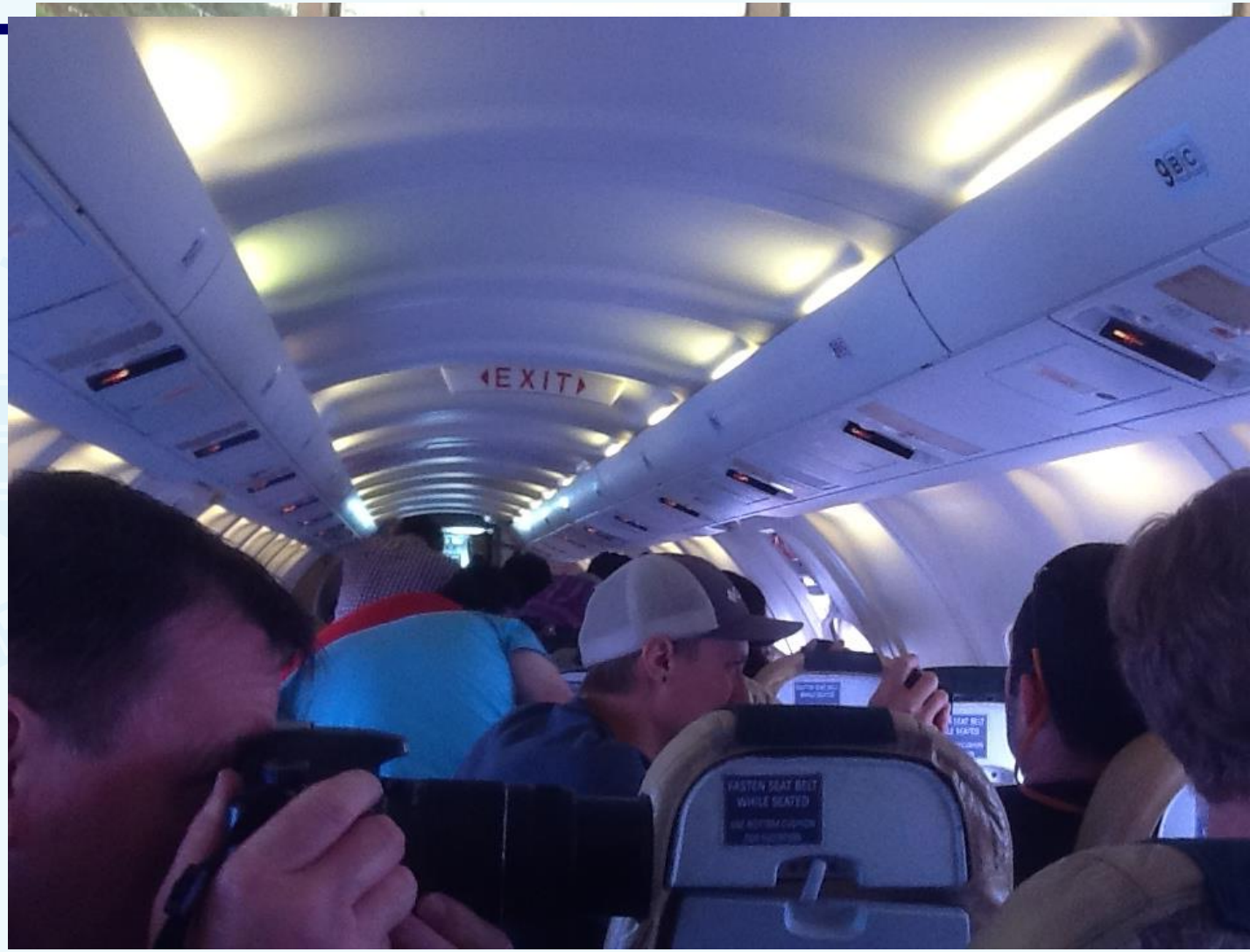
1. **State safety policy and objectives**
   - 1.1 State safety legislative framework
   - 1.2 State safety responsibilities and accountabilities
   - 1.3 Accident and incident investigation
   - 1.4 Enforcement policy
2. **State safety risk management**
   - 2.1 Safety requirements for service providers SMS
   - 2.2 Agreement on service providers safety performance
3. **State safety assurance**
   - 3.1 Safety oversight
   - 3.2 Safety data collection, analysis and exchange
   - 3.3 Safety data driven targeting of oversight on areas of greater concern or need
4. **State safety promotion**
   - 4.1 Internal training, communication and dissemination of safety information
   - 4.2 External training, communication and dissemination of safety information

Relationship SSP - SMS



Nepal Memory

Thank You



Senior Management Briefing

Safety Management by States and Service Providers

THANK YOU

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