

The background is a collage of aviation-related images. At the top left, a person in a green safety vest is on a ladder near an aircraft. To the right is a large jet engine. In the center, a globe is surrounded by two men in suits. Below the globe is an open book with a pen and glasses. At the bottom left is a computer screen showing charts. At the bottom right is a 'CIVIL AVIATION' complexity chart.

Senior Management Briefing

Safety Management by States and Service Providers

Katmandu February 2016

1/08/10

Production



SMS in Action





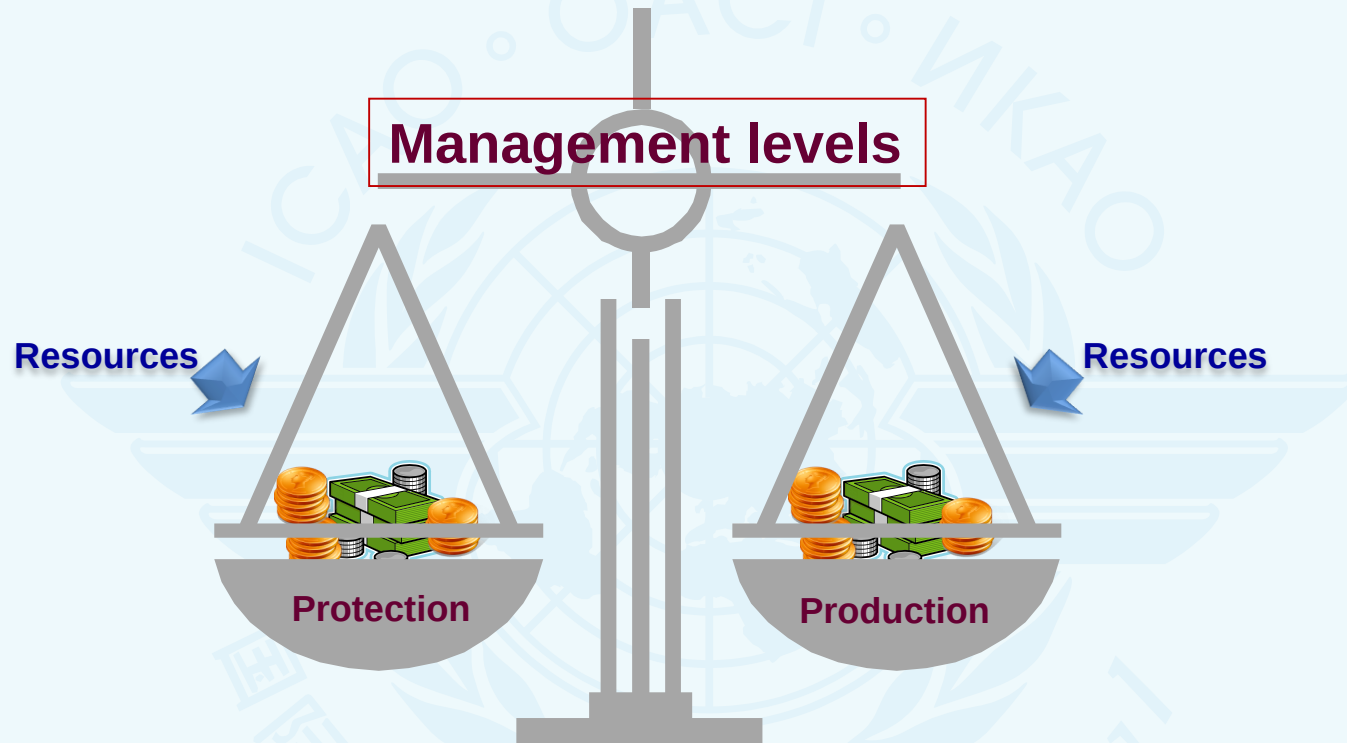
The safety stereotype



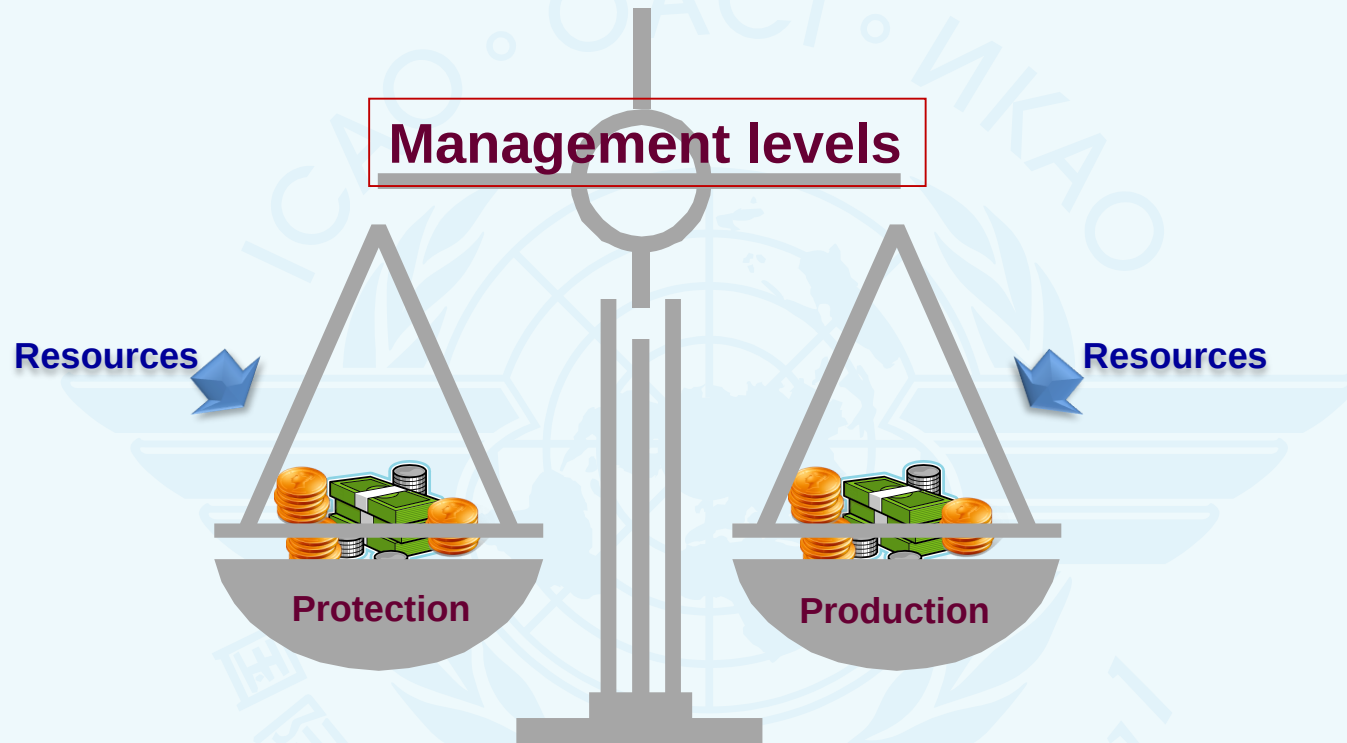
What is the fundamental objective of a business organization?



The Management Dilemma



Senior Management-Authority, Responsibility & Delegation



BANKRUPTCY 2000



NO PRODUCTION-BANKRUPTCY 2008



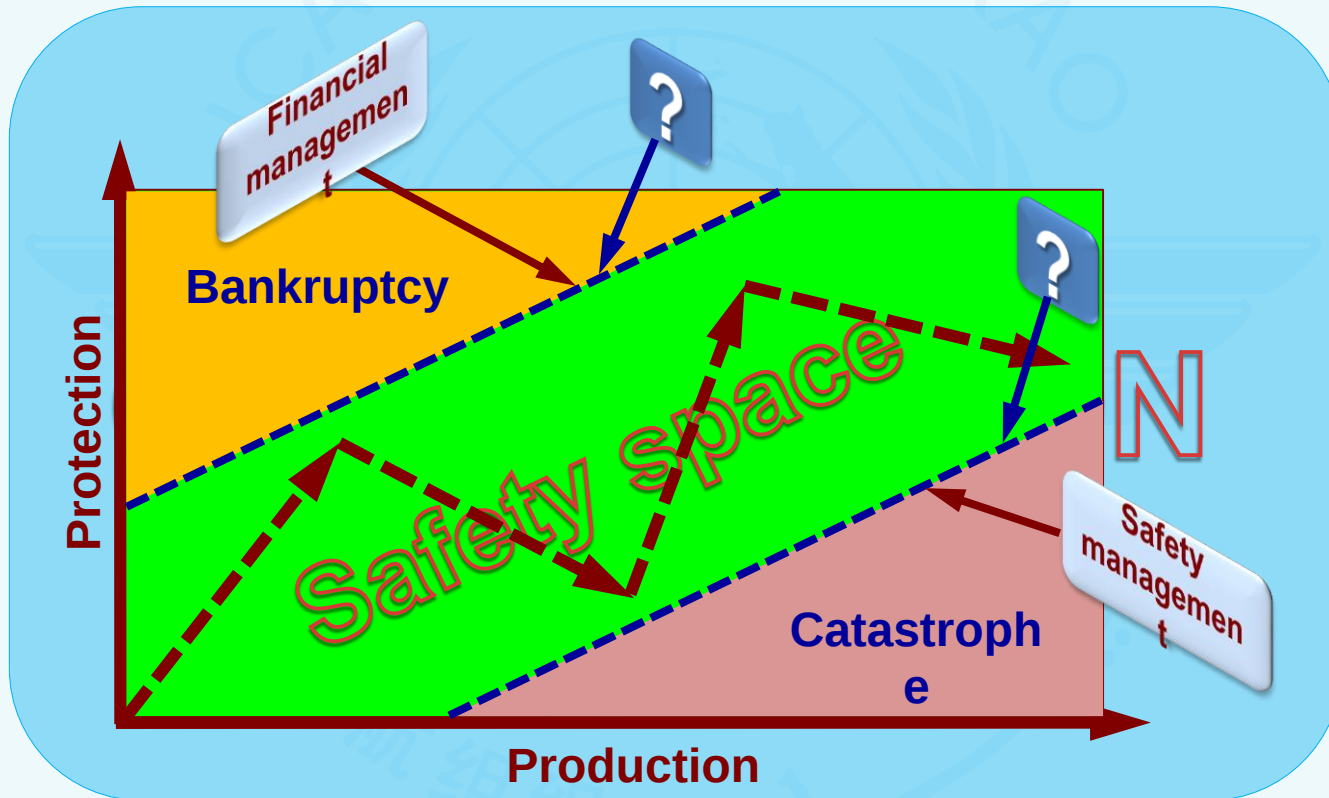
NO PRODUCTION-BANKRUPTCY-EOS B757



AIR FLORIDA 90-WASHINGTON 1982-CATASTROPHY



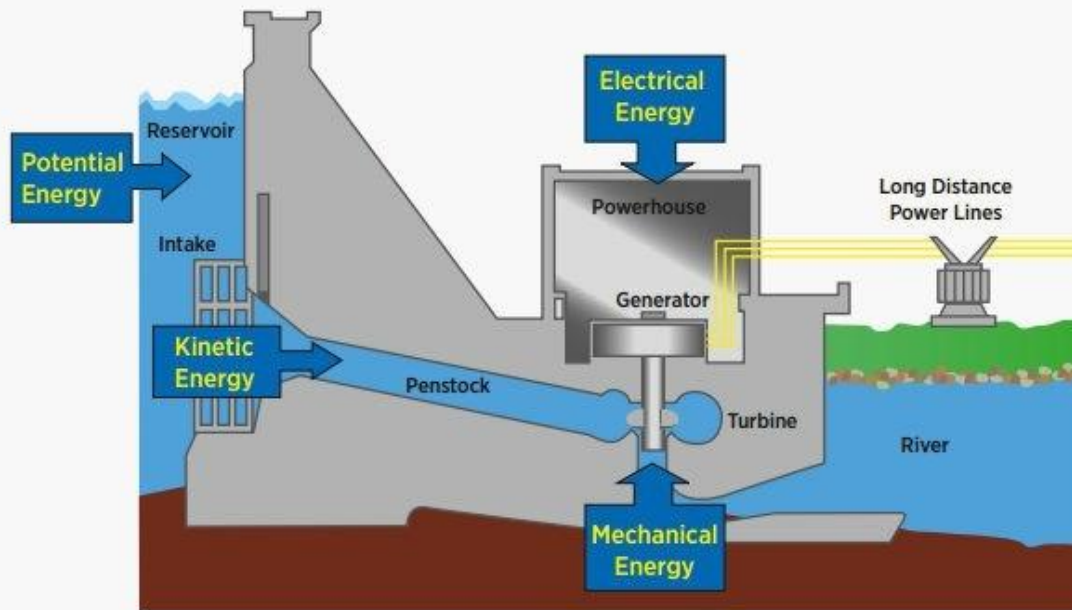
Safety Space



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?

**A MISTAKE IS
NOT ALWAYS A
FAILURE**

NOT REPORTING ONE COULD BE



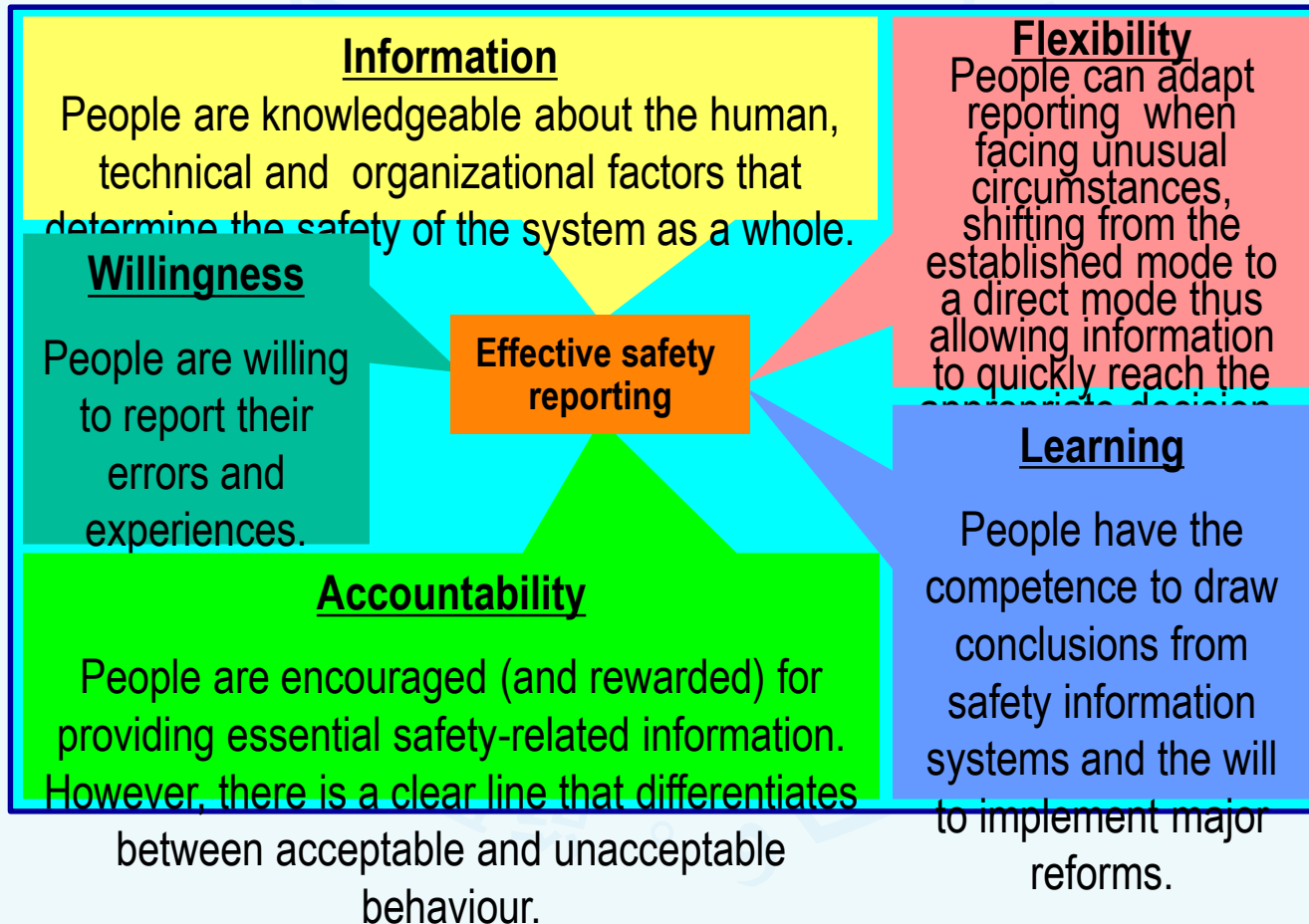
Pilots, do you know your new rights & responsibilities?

From 15 November 2015 the new Occurrence Reporting Regulation is applicable across Europe. Under the new regulation you – as a pilot – will be better protected to report events and honest mistakes in a Just Culture environment. Find out what your new rights and responsibilities are on www.eurocockpit.be



**SAFETY
REPORTING**  **MATTERS.**

Effective safety reporting – Five basic traits



Just Culture-Obstacle to Effective SMS

The background of the slide features a large, light blue watermark of the ICAO logo. The logo consists of a central globe with a compass rose, flanked by two olive branches. Above the globe, the text 'ICAO' is written in a large, serif font, and below it, the Chinese characters '国际民航组织' are visible. The entire logo is set against a light blue background.

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?

Maintenance Dirty Dozen

1. Lack of Communication
2. Complacency
3. Lack of Knowledge
4. Distraction
5. Lack of Teamwork
6. Fatigue
7. Lack of Resources
8. Pressure
9. Lack of Assertiveness
10. Stress
11. Lack of Awareness
12. Norms

Unwritten rules that are dictated and followed by the majority of a group



Norms Safety Nets

Norms provide a more advanced level of safety back up to human performance in maintenance work. They are not a substitute for all of the things listed in the Maintenance Manual, but they do provide a more robust safety net.

- Identify the negative norms (they detract from an established Safety Standard)
- Work to eliminate negative norms
- Refuse to participate in negative norms
- Always follow manufacturers procedures or have the procedures changed
- A professional doesn't take shortcuts
- Accentuate the positive norms

In the interest of Aviation Safety, the following have generously provided funding to make these posters possible:



BLAME-A ROLE IN RISK MANGEMENT?



CSM West Midlands

Humans make mistakes
because the systems,
tasks, and processes they
work in are poorly designed.

Will this crew do it again?



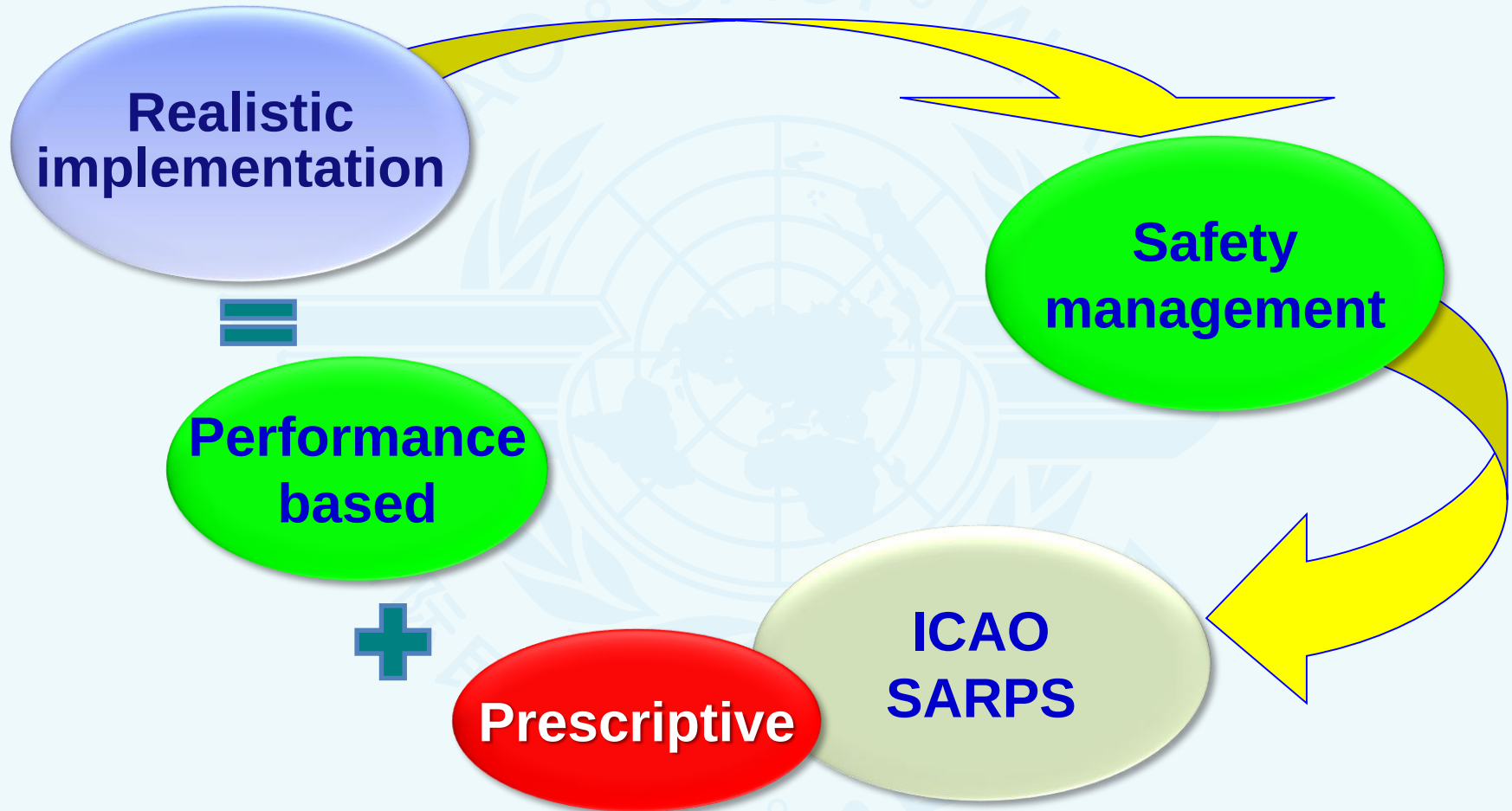
Objectives

- ❖ 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

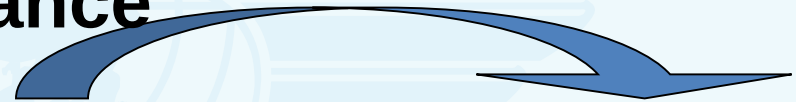
Before safety management

Traditional approach

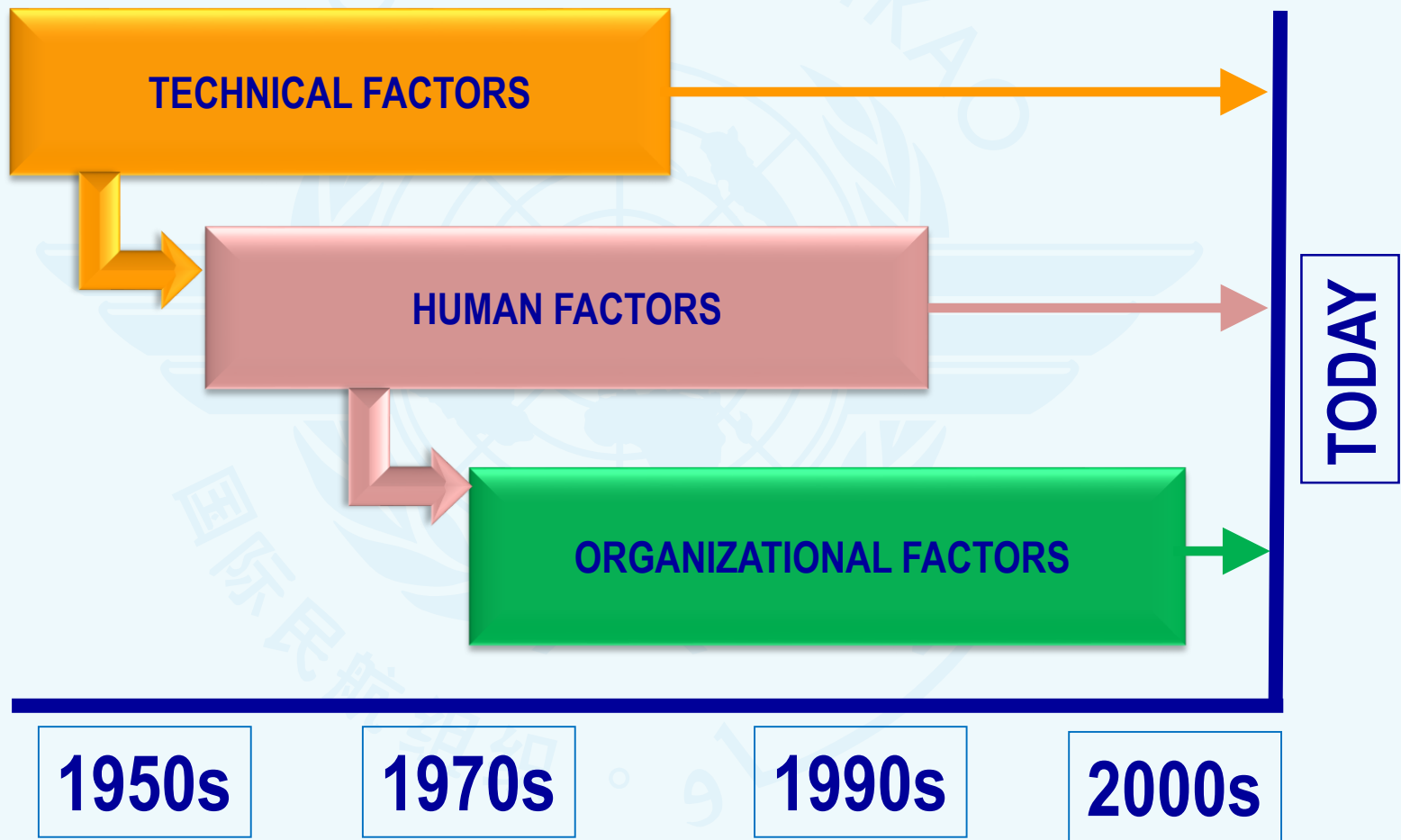
Preventing accidents

Accident investigation - Focus on
outcomes (causes)

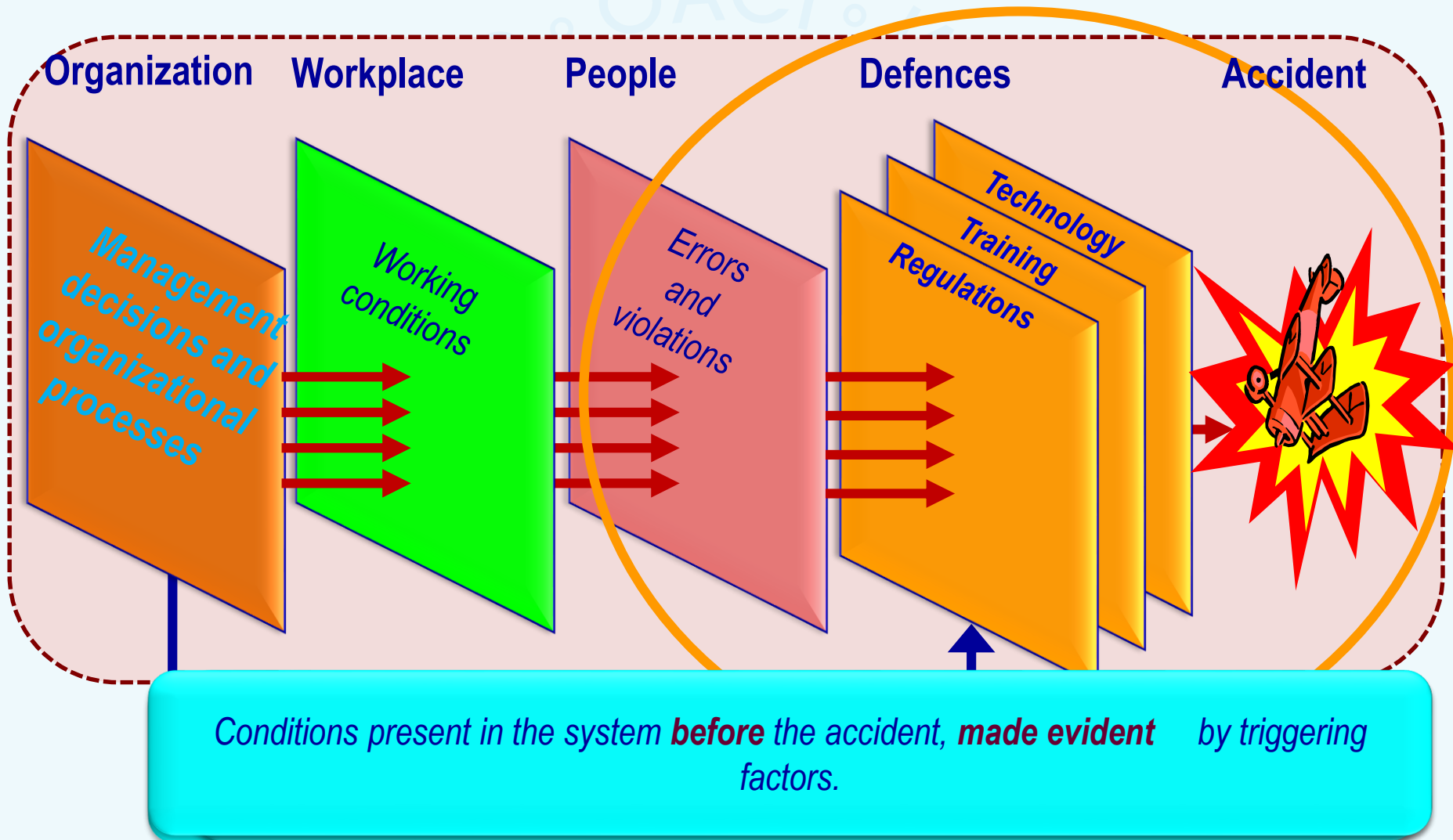
Regulatory compliance



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

Management levels

Resources

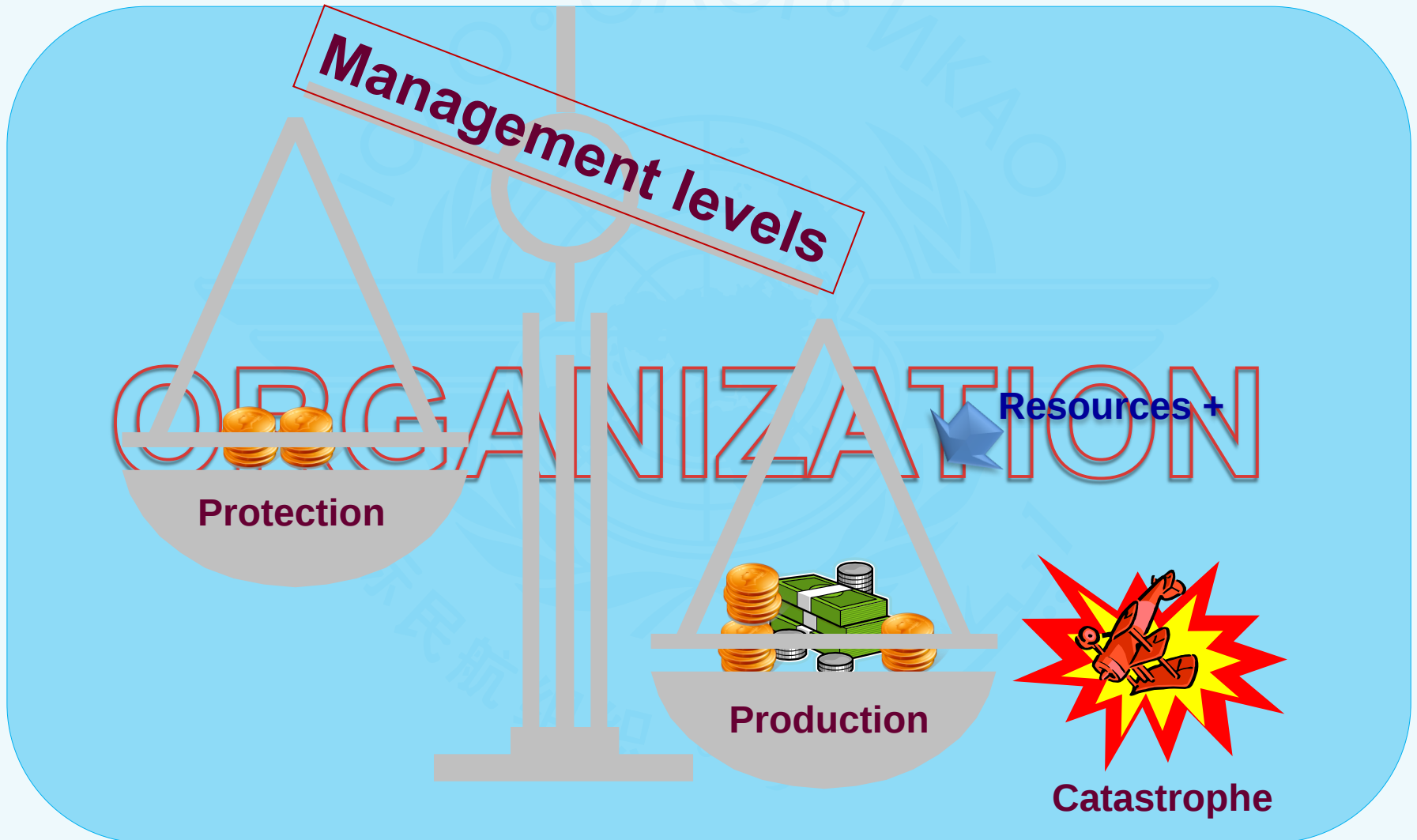
ORGANIZATION

Resources

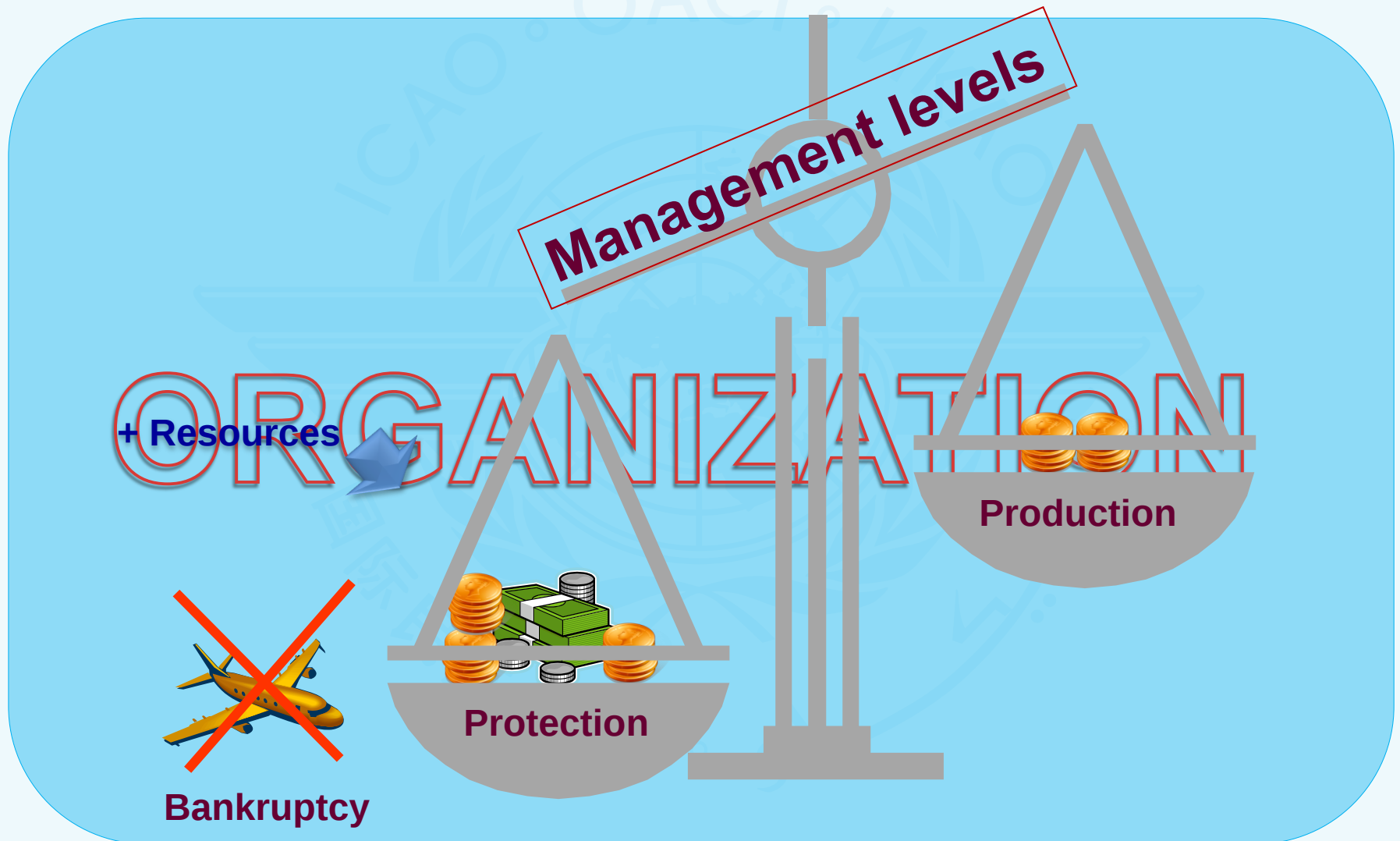
Protection

Production

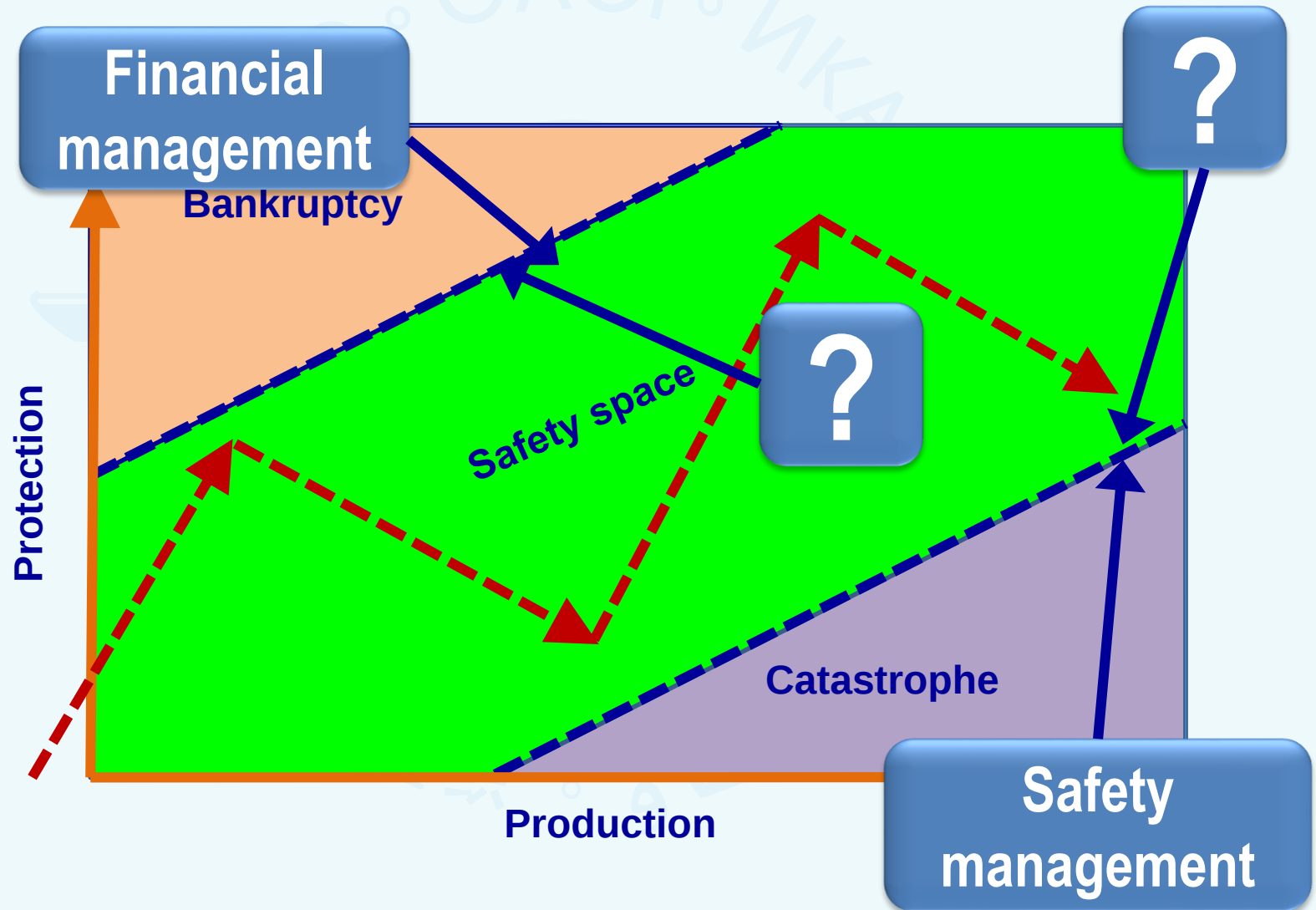
The management dilemma



The management dilemma



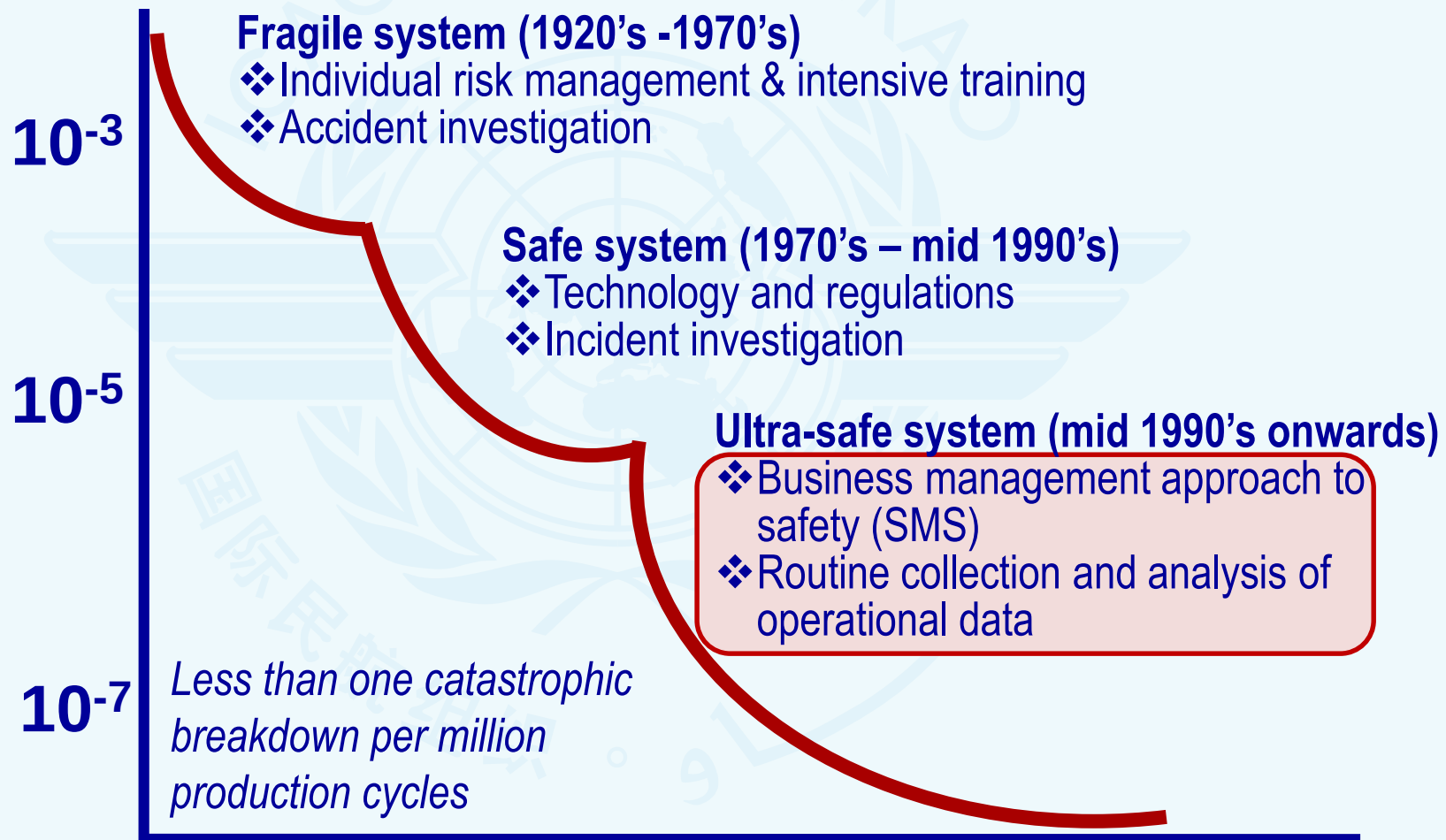
Safety space



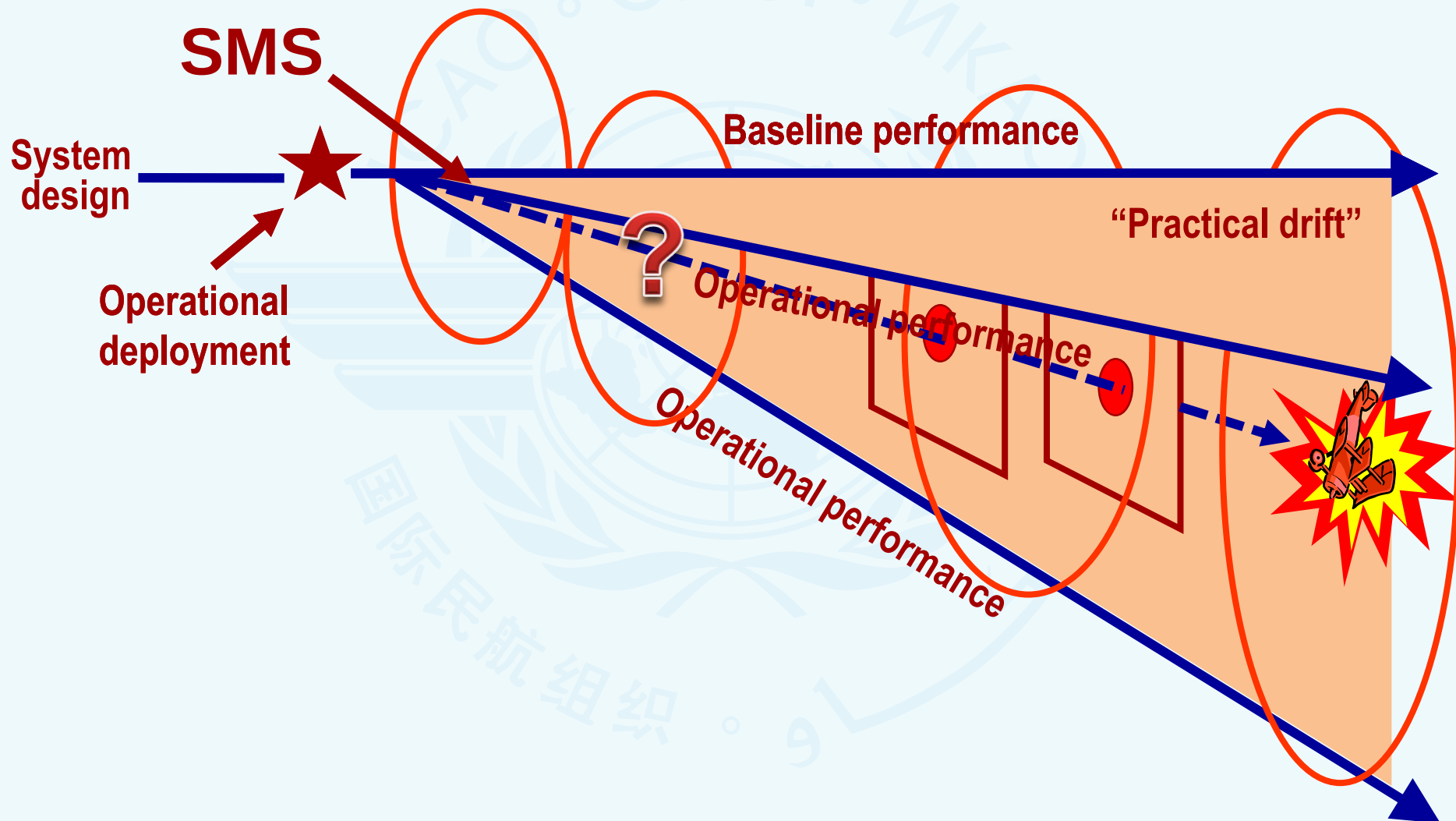
Concept of safety (Doc 9859)

❖ **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**

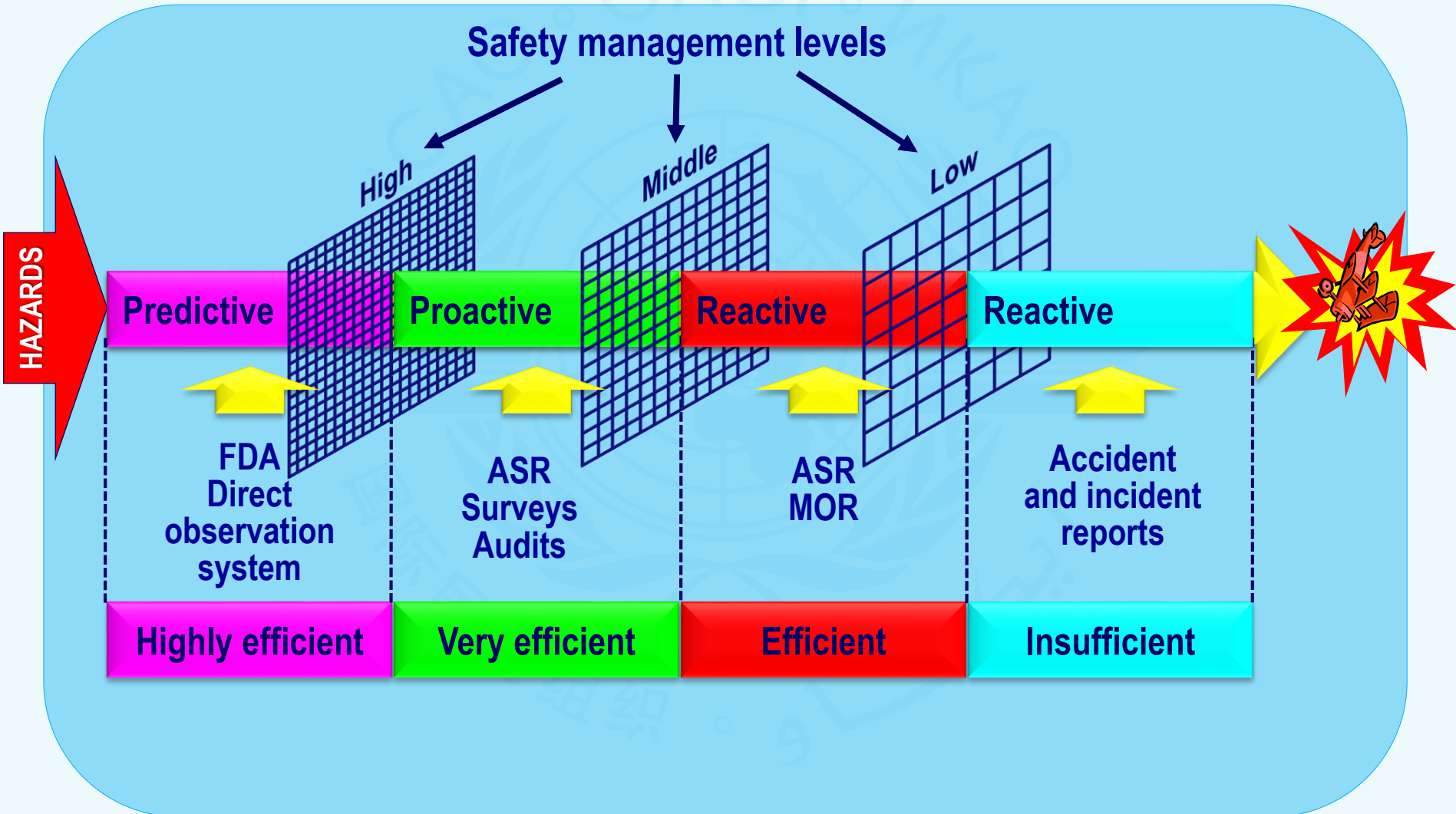
Why SM? – The first ultra-safe industrial system



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:

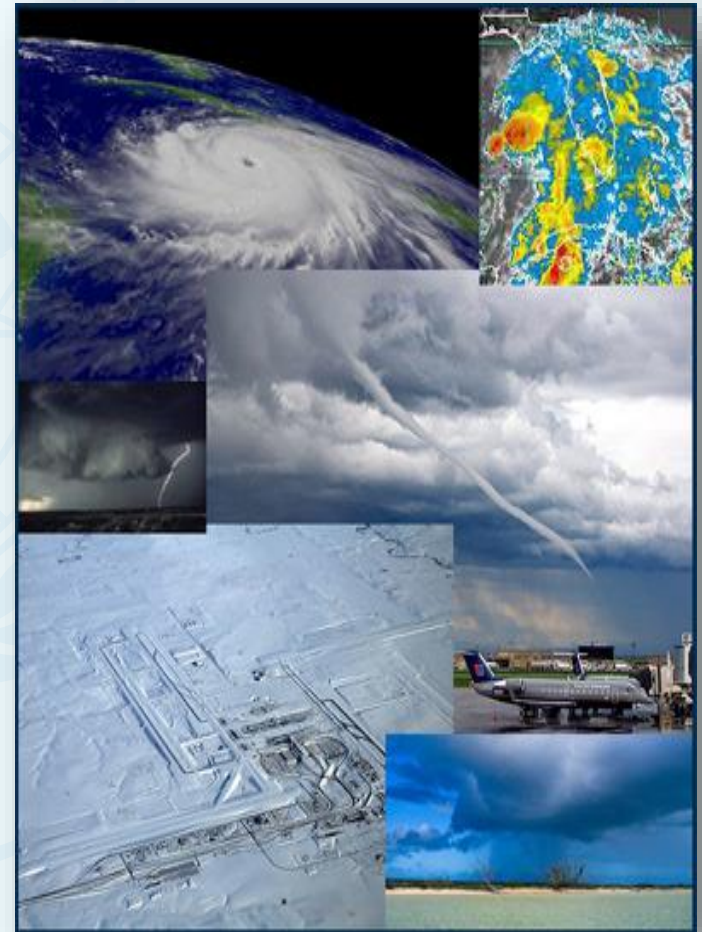
- *E.g.: earthquakes, volcanoes, tsunamis, floods and landslides.*

❖ 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 collage illustrates various sources of hazard identification. It includes a photograph of a road with a yellow center line, a yellow traffic sign with the number 27 and a right-turn arrow, a photograph of a lightning bolt striking a dark landscape, a screenshot of a 'HAZARD REPORT FORM' with various input fields, and a graph showing a distribution of data.

HAZARD REPORT FORM

HAZARD REPORTING PROGRAM: HAZARD REPORT NUMBER

HAZARD (To be filled out by Employee)

☐ MATERIAL ☐ FACILITY ☐ HEALTH ☐ PROCEDURE ☐ EQUIPMENT

IF A FACILITY PROVIDE ADDRESS OR LOCATION IF VEHICLE OR EQUIPMENT PROVIDE TYPE, MODEL AND SERIAL NUMBER

Agency name: (PC) 100

Building address line 1: (PC) 100

Building address line 2: (PC) 100

City: (PC) 100

State: (PC) 100

Zip: (PC) 100

Agency address: (PC) 100

Director of Travel: (PC) 100

First name: (PC) 100

Professional: (PC) 100

Building address line 1: (PC) 100

Building address line 2: (PC) 100

City: (PC) 100

State: (PC) 100

Zip: (PC) 100

Phone: (PC) 100

Email: (PC) 100

Director of Travel: (PC) 100

First name: (PC) 100

Professional: (PC) 100

Building address line 1: (PC) 100

Building address line 2: (PC) 100

City: (PC) 100

State: (PC) 100

Zip: (PC) 100

Phone: (PC) 100

Email: (PC) 100

RECOMMENDATIONS: (If you have ideas on how to fix the hazard, please tell us)

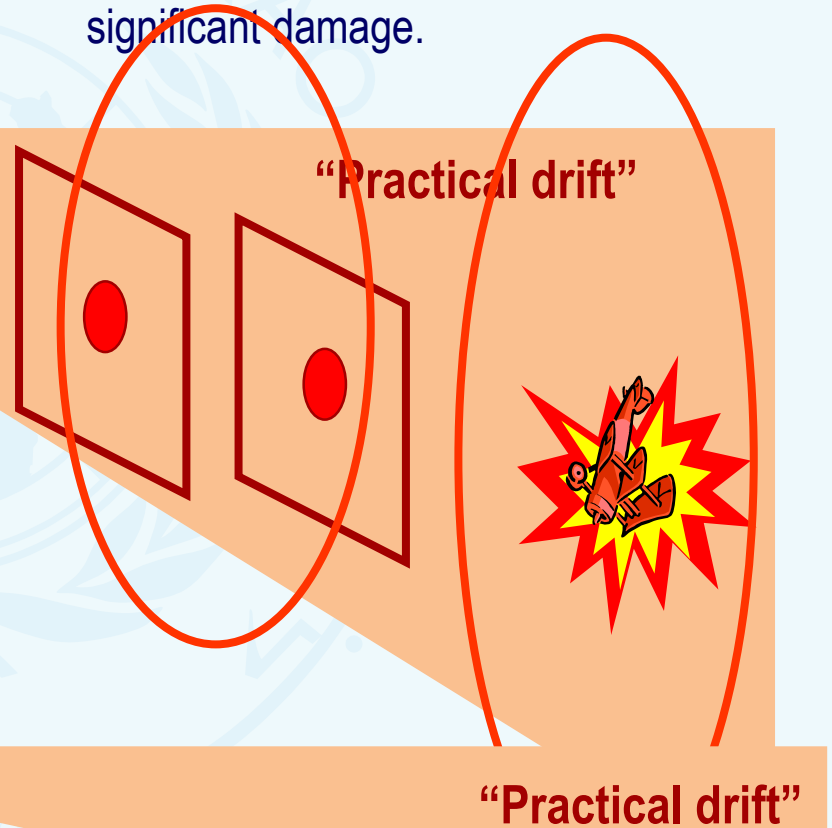
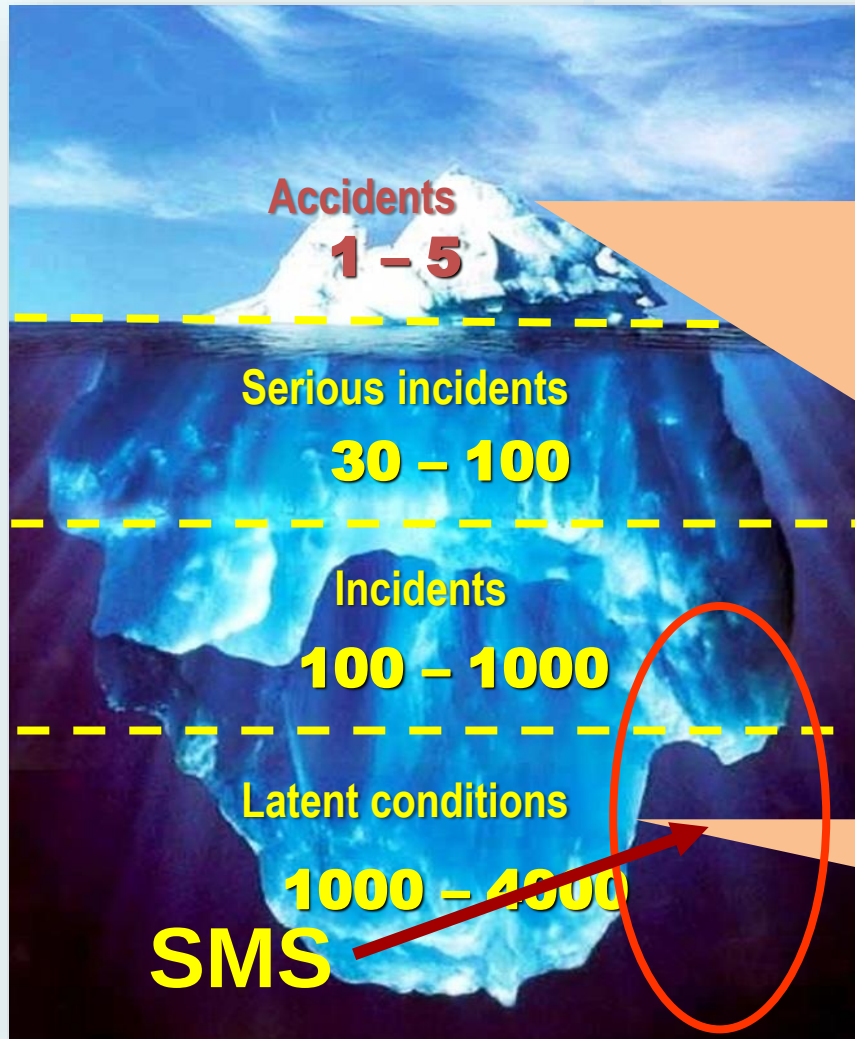
NAME: DEPARTMENT:

DATE: PHONE:

FORWARD PART I OF THIS HAZARD REPORT FORM TO THE DEPARTMENT SAFETY OFFICER.

The focus of hazard identification

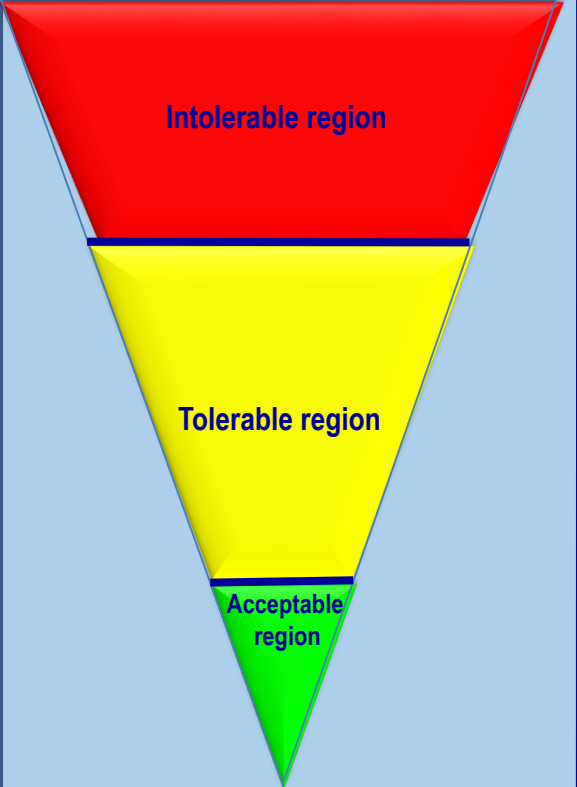
- ❖ Hazard identification is a wasted effort if restricted to the aftermath of rare occurrences where there is serious injury, or significant damage.



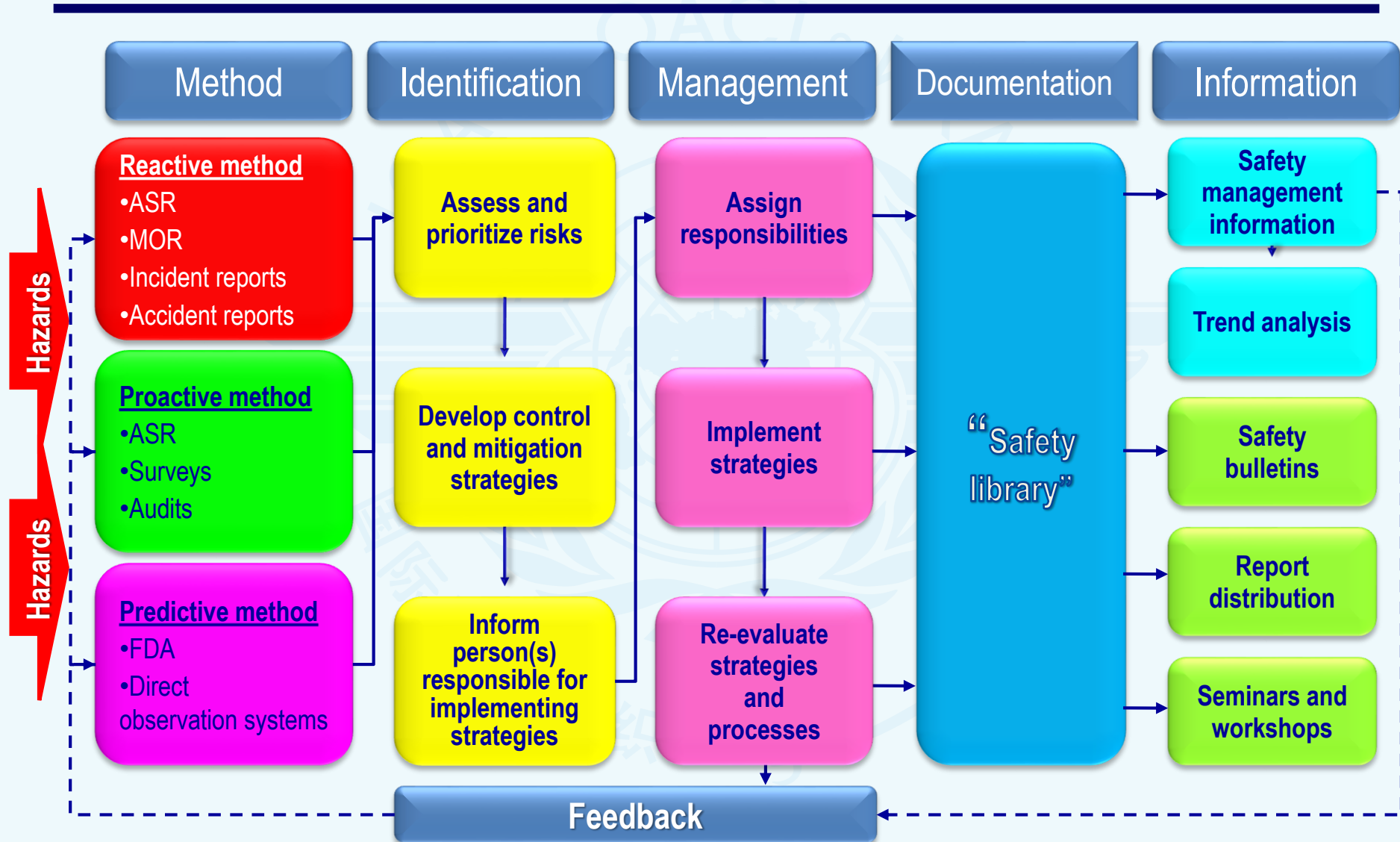
Risk assessment

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
 Intolerable region	5A, 5B, 5C, 4A, 4B, 3A	Unacceptable under the existing circumstances
Tolerable region	5D, 5E, 4C, 4D, 4E, 3B, 3C, 3D, 2A, 2B, 2C	Acceptable based on risk mitigation. It might require management decision
Acceptable region	3E, 2D, 2E, 1A, 1B, 1C, 1D, 1E	Acceptable

Connecting processes





Part II – Safety management requirements

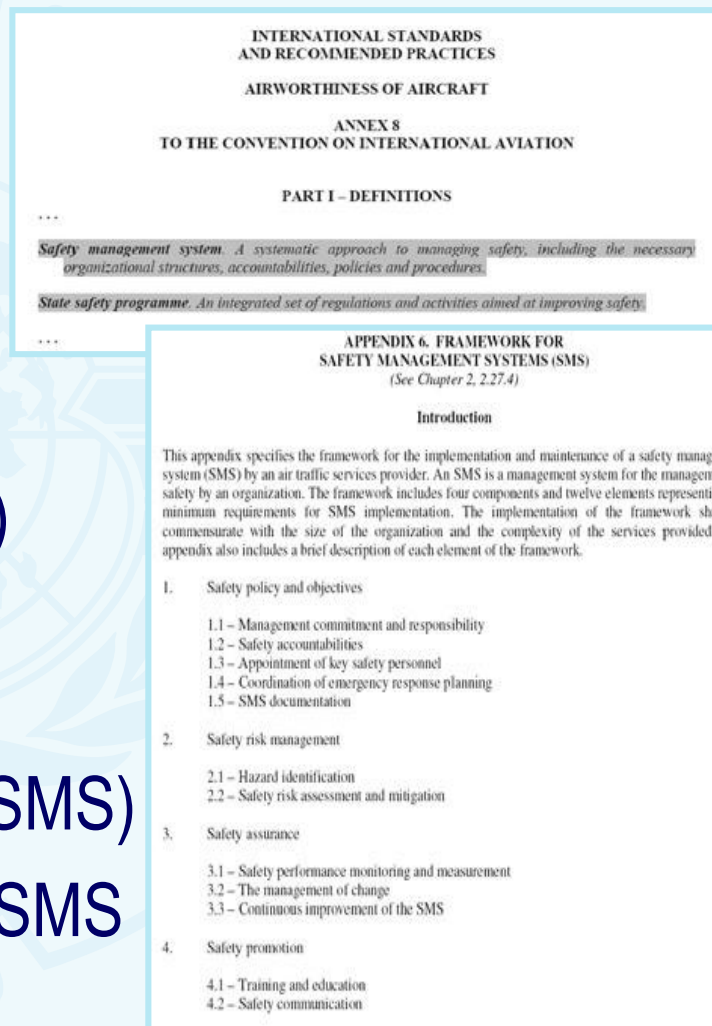
ICAO safety management SARPs – The big picture

❖ 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



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



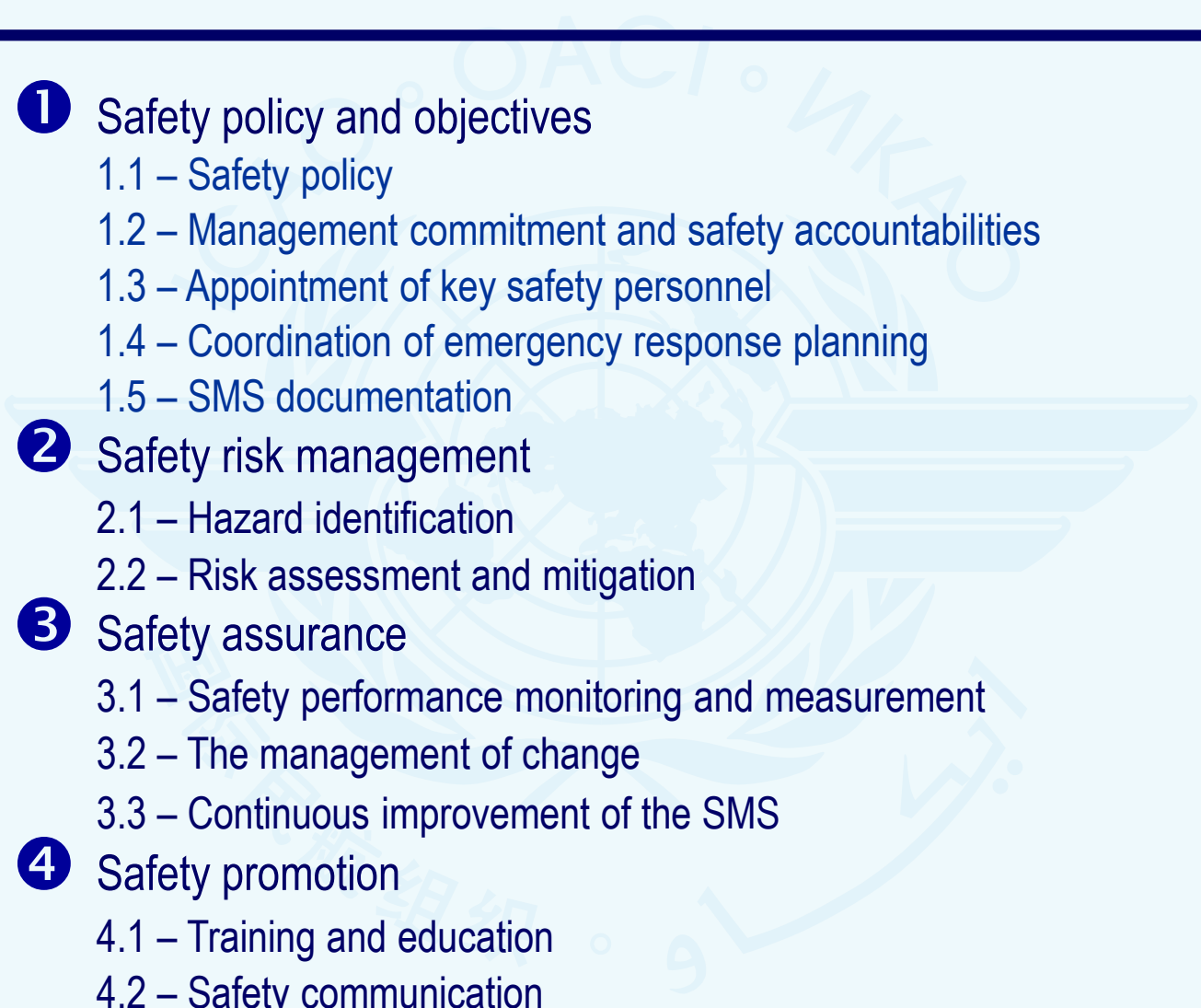
What is an SMS?

➤ 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

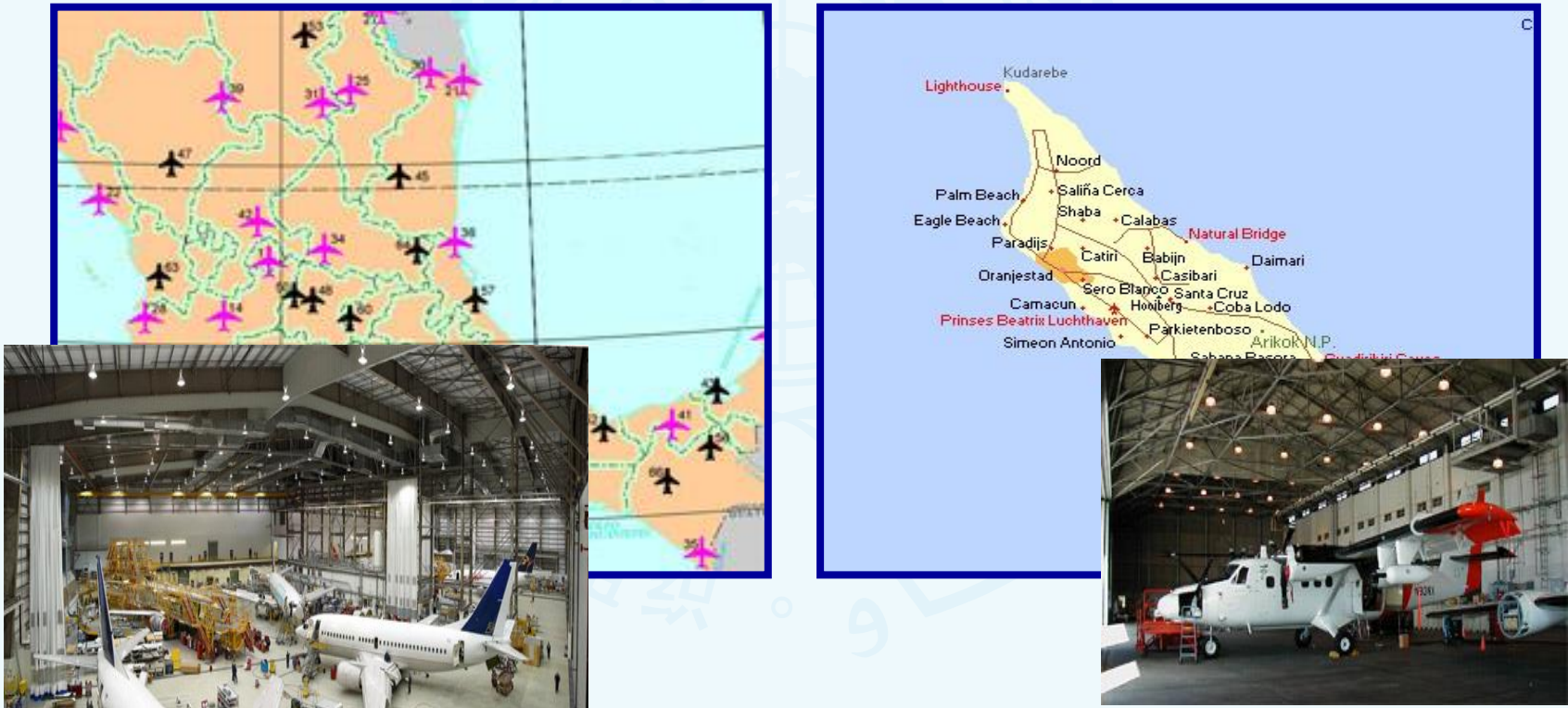


Two fundamental principles

- ❖ 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

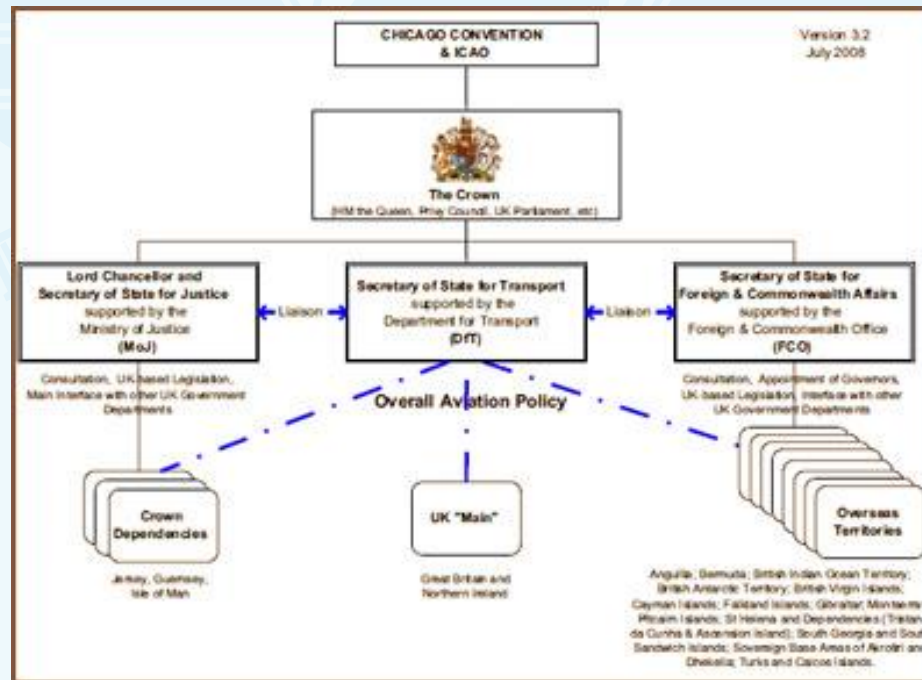
SSP in context

- ❖ 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

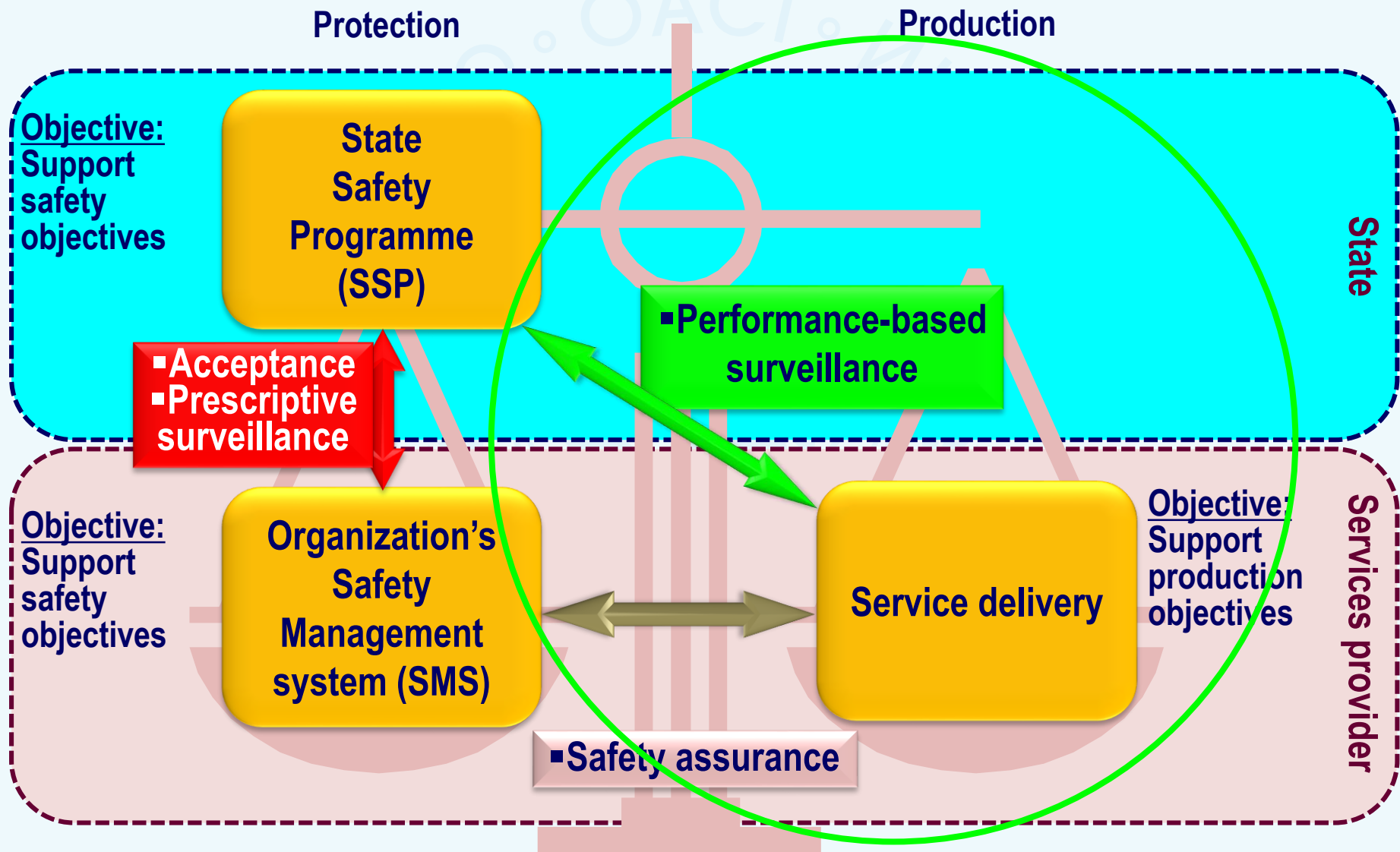
3. State safety assurance

- 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**



The background is a collage of aviation-related images. At the top left, a person in a green safety vest works on an aircraft. To the right is a large jet engine. Below these are images of a globe, two men in suits, a person in a library, and a person in a flight suit. The ICAO logo is visible in the upper center.

Senior Management Briefing

Safety Management by States and Service Providers

THANK YOU

CIVIL
AVIATION
SAFETY

Weighting Factors - Certificate Holder Complexity Chart

non-transport category aircraft with an MTOW of less than 1700 kg

Type	Type		4 Seats		VFR		IFR		Total
	Weight	Complexity	Weight	Complexity	Weight	Complexity	Weight	Complexity	
1-2	1	1	1	1	1	1	1	1	10
3-4	2	2	2	2	2	2	2	2	20
5-6	3	3	3	3	3	3	3	3	30
7-8	4	4	4	4	4	4	4	4	40
9-10	5	5	5	5	5	5	5	5	50
11-12	6	6	6	6	6	6	6	6	60
13-14	7	7	7	7	7	7	7	7	70
15-16	8	8	8	8	8	8	8	8	80
17-18	9	9	9	9	9	9	9	9	90
19-20	10	10	10	10	10	10	10	10	100
>20	11	11	11	11	11	11	11	11	110

1/08/10