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European Union Aviation Safety Agency

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and implemented by EASA

Effective Aviation Safety Occurrence Reporting Systems: Implementation and Use in SSP/SMS

EU-Africa Safety in Aviation (EU-ASA) Project

Dates: 15–18 July

Online: Zoom

Pablo Hernández-Coronado Quintero

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An Agency of the European Union

Module 0: Registration, Course Introduction and Welcome

- → Presentation of the expert
- → Presentation of the participants
- → Workshop objectives
- → Agenda

The expert: Pablo Hernández-Coronado

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- M.Sc. in Aeronautical Engineering from the Polytechnic University of Madrid.
- 2001 Fulbright scholarship, for which he studied a Master in Systems Engineering and Architecture at the University of Southern California.
- In Los Angeles he obtained his license as a private pilot at Santa Monica Municipal Airport.
- Master's degree from the Universidad Rey Juan Carlos in Decision Systems Engineering.
- Director of Safety Risk & Quality Management at AESA (10 years), leading the implementation of SSP in Spain.
- Chairman of the ICAO Panel on Safety Management (Annex 19)
- Member of the ICAO Task Force on Safety Information Protection
- Chairman of the Spanish SSP Coordination Committee and CEANITA.
- General Manager of Business and Commercial Operations of ADIF
- Currently: Head of the International Strategy Department (AESA)

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Presentation of the participants

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Objectives of the workshop

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Workshop Objective: To strengthen the capabilities of State/industry personnel in implementing SSP and SMS by providing practical knowledge, real-world examples, and tools for effective aviation safety occurrence reporting systems.

Expected Outcomes:

- Understand legal and institutional frameworks (e.g. Annex 19, Regulation (EU) 376/2014).
- Implement effective reporting systems, promote just culture, and ensure data protection.
- Collect, classify, and assess occurrences using standard taxonomies and risk models.
- Use data for safety performance indicators, analysis, visualisation, risk-based oversight, and safety promotion.

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Agenda

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Day 1 – Foundations, Legal and Organisational Frameworks

TIME	PABLO HERNANDEZ-CORONADO, AESA
09:00 H – 09:15 H	Welcome and Introduction to the Workshop
09:15 H – 10:00 H	**Introduction and Basic Concepts** • Purpose of safety data reporting • Role in SSP and SMS implementation
10:00 H – 10:30 H	**Legislative Framework and regulations** • ICAO Annex 19 overview • Regulation (EU) 376/2014 and associated regulations
10:30 H – 10:45 H	BREAK
10:45 – 11:30 H	**Legislative Framework and regulations (cont.)** • Responsibilities of operators (national/foreign), organisations, and authorities
11:30 – 12:30 H	**Importance and Use of Data for Managing Safety** • From compliance-based to data-driven and performance-based oversight • Linking data with proactive safety management
12:30 H – 13:00 H	LUNCH BREAK
13:00 – 14:00	**Safety Culture and Occurrence Reporting** • Why is safety culture important? • Just Culture and trust in reporting

Agenda

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Day 2 – Protection, Governance and Authority Coordination

TIME	PABLO HERNANDEZ-CORONADO, AESA
09:00 H – 09:15 H	Recap of Day 1
09:15 H – 10:00 H	**Safeguards for Reporting** • Protection of safety data, safety information and related sources (authority and service providers) • Legal provisions, confidentiality and institutional barriers • Procedure to unprotect safety information in gross negligence and wilful misconduct cases
10:00 H – 10:30 H	Practical Examples and Case Studies
10:30 H – 10:45 H	BREAK
10:45 – 11:45 H	**Data Collection and Processing Systems (SDCPS). Data Governance** • Sources of safety data • Data structure and format • Storage, quality, integration and fusion • Governance models and roles
11:45 – 12:30 H	**Occurrence Reporting System (ORS)** • Mandatory and voluntary occurrence reporting systems (notification, sector-specific forms) • Confidential Safety Reporting System (CSR)
12:30 H – 13:00 H	LUNCH BREAK
13:00 – 14:00	**The Internal Organisation of the Civil Aviation Authority and Coordination with the Accident Investigation Authority** • Internal information flow within the CAA (Functions, processes and activities) • Personnel competencies (Data analyst/ Domain expert) • Coordination with the AIA

Agenda

Day 3 – Reporting Quality, Classification, and Risk Management

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TIME	PABLO HERNANDEZ-CORONADO, AESA
09:00 H – 09:15 H	Recap of Day 2
09:15 H – 10:30 H	**Collection and Storage of Information** • Quality and content of occurrence reports • Reporting format and data quality • ECCAIRS 2 • Other SDCPS tools
10:30 H – 10:45 H	**BREAK**
10:45 – 12:30 H	**Data Classification and Initial Safety Assessment** • Taxonomies, the importance of using harmonised taxonomies (e.g., ADREP, CAST) to ensure consistency, comparability, and effective data exchange among all stakeholders • Event coding • Severity assessment • Review and classification of sample reports
12:30 H – 13:00 H	**LUNCH BREAK**
13:00 – 14:00	**Safety Risk Classification of Occurrences: SSP & SMS** • European Risk Classification Scheme (ERCS) and related regulations • Other safety risk classification methodologies: SSP & SMS • Interface Risks • Practical examples and case studies

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Agenda

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Day 4 – Analysis, Safety Risk Management, Safety Performance, Information Sharing and Wrap-Up

TIME	PABLO HERNANDEZ-CORONADO, AESA
09:00 H – 09:15 H	Recap of Day 3
09:15 H – 10:15 H	**Occurrence Investigation, Safety Risk Management and Follow-up: SSP and SMS** • National and EU levels • Tools for reporting, analysis, follow-up and mitigation actions • Strategies for safety risk management • Practical examples and case studies
10:15 H – 10:30 H	**Introduction to Safety Indicators and Monitoring** • Using occurrence data to build and monitor SPIs • Integration of safety oversight with occurrence reporting • Service provider's risk profile and Safety Risk Based Surveillance (SRBS)/Oversight
10:30 H – 10:45 H	BREAK
10:45 – 11:15 H	**Introduction to Safety Indicators and Monitoring (Cont.)** • Safety Performance Metrics and Safety Culture Indicators • IT tools and interoperability
11:15 – 12:00	**Data Analysis and Visualisation** • Visualisation of information stored in the national database • Effective dashboards and communication tools • Transforming data into actionable insights: SSP top safety issues
12:00 – 12:30	**The EU Safety Risk Management process** • From occurrence analysis to the EPAS
12:30 H – 13:00 H	LUNCH BREAK
13:00 – 13:45	**Communication and Sharing of Safety Information** • Internal and external communication strategies • Regional sharing practices: Exchange of Information Between Partner States and EASA • European Central Repository: Dissemination of Information • Sharing information with the public
13:45 – 14:00	**Final Wrap-Up and Workshop Closure** • Summary of key takeaways • Final Q&A and feedback

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DAY 1

Foundations, Legal and Organisational Frameworks

FOUNDATIONS, LEGAL AND ORGANISATIONAL FRAMEWORKS

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Module 1: Introduction and Basic Concepts

- → Principles and basic concepts
- → Purpose of safety data reporting
- → Role in SSP and SMS implementation

Principles and basic concepts

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BY THE WAY… WHAT DO WE MEAN BY “SAFETY”?

- zero accidents or serious incidents — a view widely held by the travelling public;
- freedom from hazards, i.e. those factors which cause or are likely to cause harm;
- attitudes of employees of aviation organizations towards unsafe acts and conditions;
- error avoidance; and
- regulatory compliance
- ¿…?

Principles and basic concepts

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BY THE WAY… WHAT DO WE MEAN BY “SAFETY”?

- We cannot eliminate accidents and serious incidents
- Failures and operational errors will occur in aviation, in spite of the best and most accomplished efforts to prevent them
- No human activity or human-made system can be guaranteed to be absolutely free from hazards and operational errors
- safety risks and operational errors that are controlled to a reasonable degree are acceptable in an inherently safe system

Principles and basic concepts

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BY THE WAY… WHAT DO WE MEAN BY “SAFETY”?

> ***Safety.*** The state in which risks associated with aviation activities are reduced and controlled to an acceptable level.

→ Safety is “the **state in which risks** associated with aviation activities, related to, or in direct support of the operation of aircraft, **are reduced and controlled to an acceptable level**”.

Principles and basic concepts

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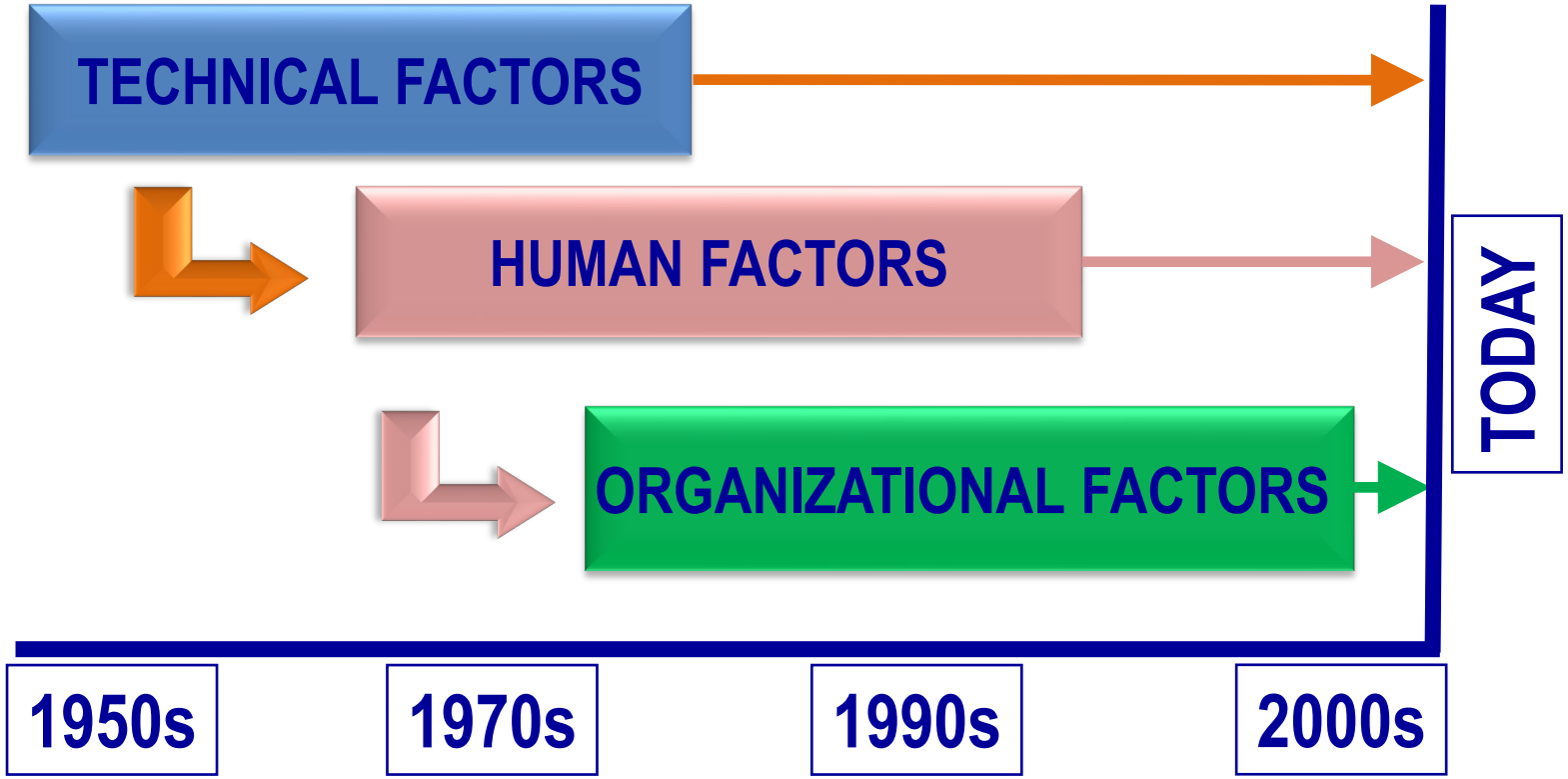
WHERE DO WE COME FROM?

- **Safety provisions on hard rules: Regulation, Law, Decree, MO**
- **Regulatory compliance = being safe: *the grater the margin, the safer***



Principles and basic concepts

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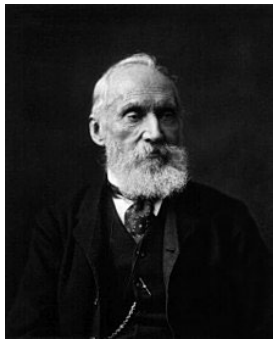
Principles to Follow

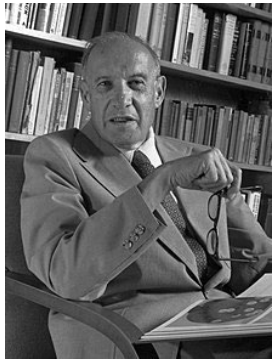
- **William Thomson Kelvin (Lord Kelvin) - British Physicist and Mathematician**

  "What is not defined cannot be measured. What is not measured cannot be improved. What is not improved always degrades."



- **Peter Drucker - Management Consultant, American Educator**

  "What cannot be measured cannot be controlled; what cannot be controlled cannot be managed; what cannot be managed cannot be improved."



Principles and basic concepts

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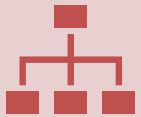
In order to achieve its production objectives, **the management of any aviation organisation requires the management of many business processes**

Managing safety is one such business process



Safety management is a core business function just as financial management, HR management, quality management, etc.

Purpose of safety data reporting

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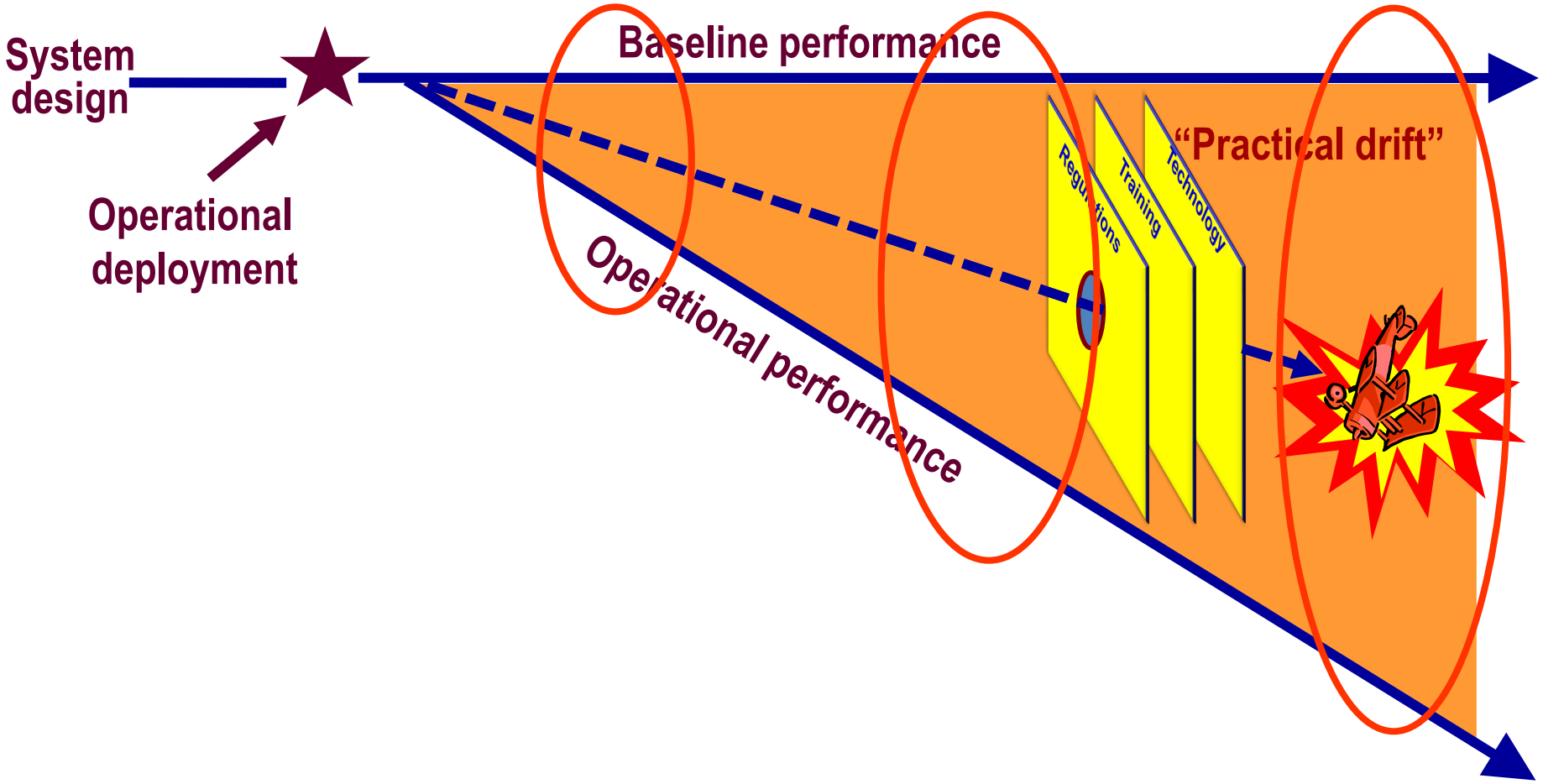
WHY MANAGE SAFETY? AN IMPERFECT SYSTEM



Purpose of safety data reporting

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SSP/SMS… WHAT FOR?

Traditional Approach

1.- Aviation system performs most of the time as per design specifications.

2.- Prescriptive regulations compliance based; audits and inspections

3.- Outcome oriented:

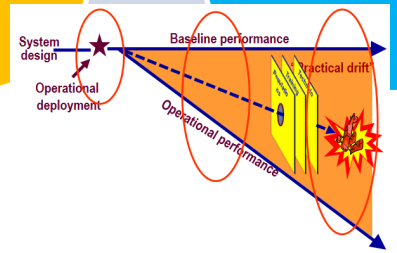
Accidents investigations

New Approach

1.-Aviation system does not perform most of the time as per design specifications (practical drift).

2.- Performance-based: risk management and safety assurance

3.- Process oriented



Purpose of safety data reporting

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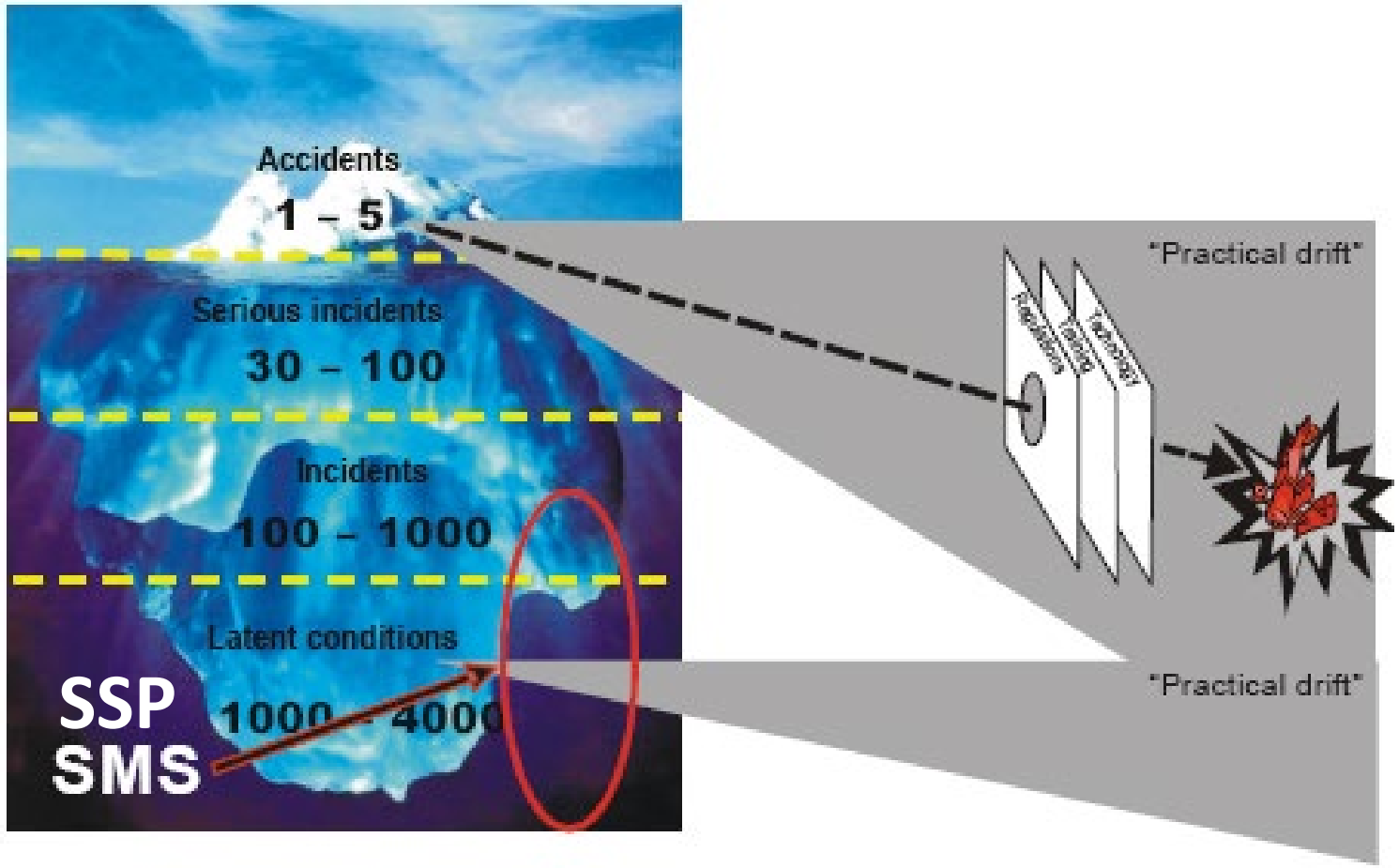
Why manage safety? An imperfect system



Purpose of safety data reporting

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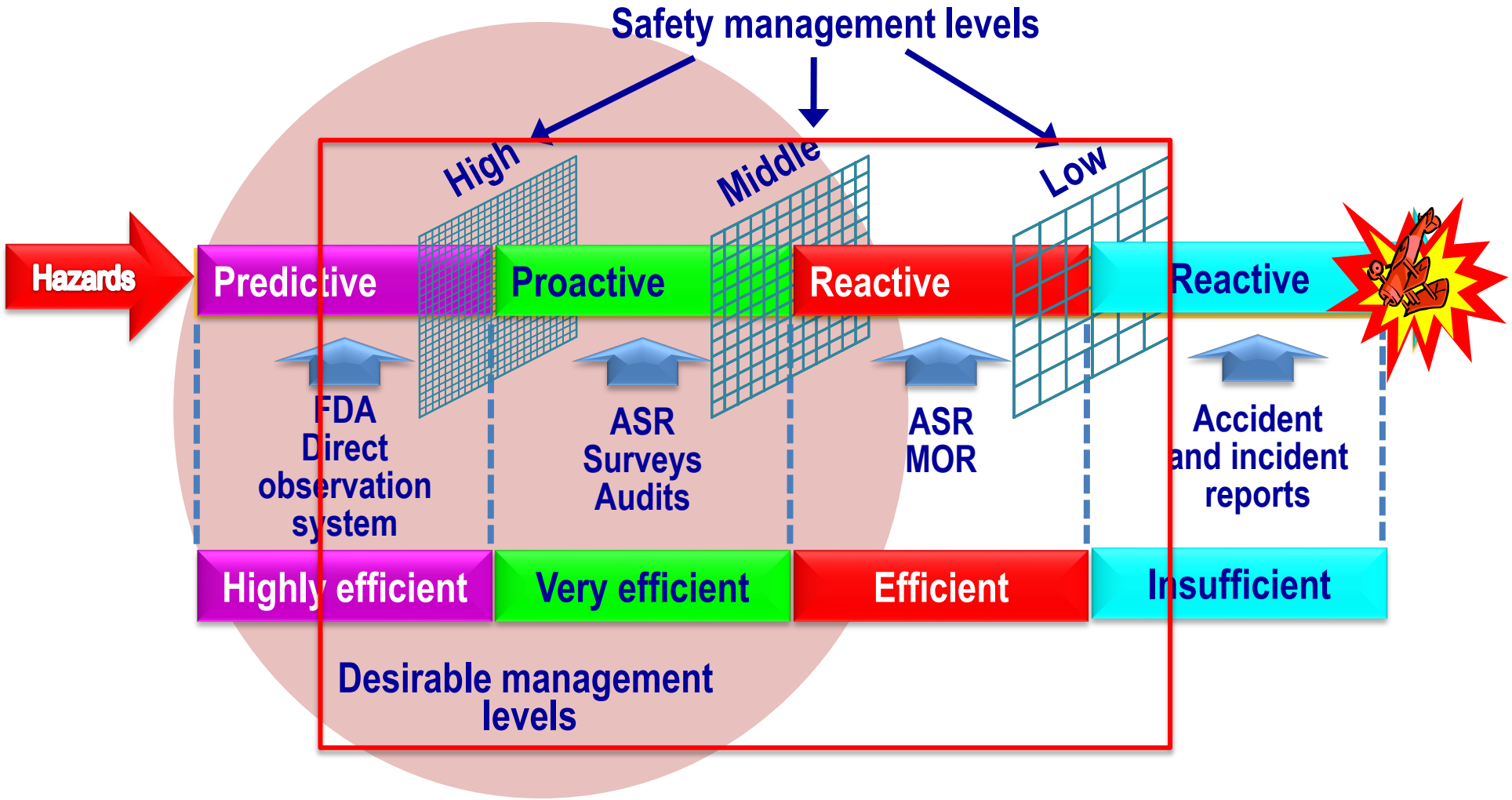

Purpose of safety data reporting

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Reactive method

The reactive method responds to the events that already happened, such as incidents and accidents

Proactive method

The proactive method looks actively for the identification of safety risks through the analysis of the organisation's activities

Predictive method

The predictive method captures system performance as it happens in real-time normal operations to identify potential future problems

Role in SSP & SMS implementation

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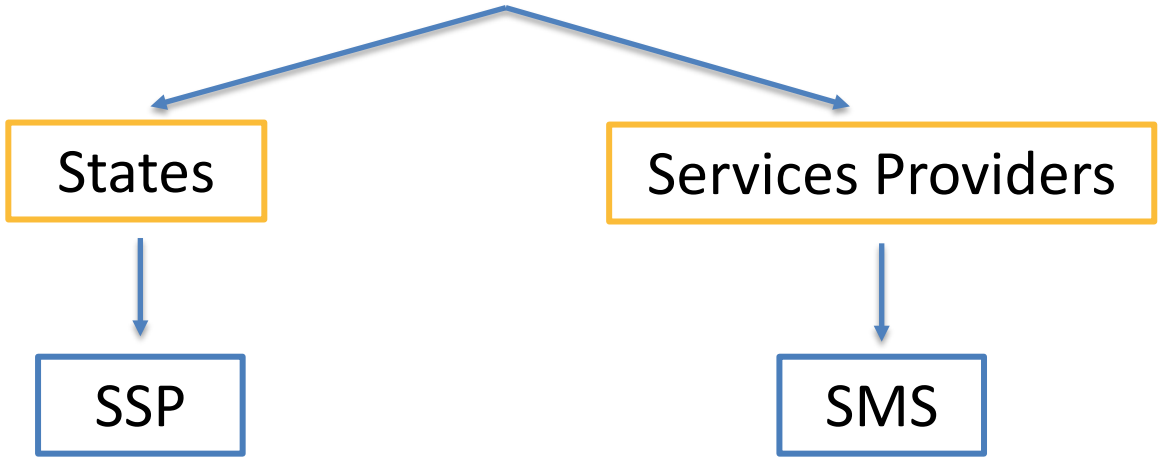
→ What is safety risk management?

Safety management seeks to **proactively mitigate safety risks** before they result in aviation accidents and incidents. Through the implementation of safety risk management, states and service providers can manage their safety activities in a **more disciplined, integrative and focused manner.**



Role in SSP and SMS implementation

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- **ICAO defines SSP as:**

An integrated set of regulations and activities aimed at improving safety

State safety programme (SSP). An integrated set of laws, regulations, policies, objectives, processes, procedures and activities aimed at ~~improving~~ managing safety, at the State level.

- **An SSP is a management system for the management of safety by the State**
- **Decisions are taken based upon safety data analysis, resources are allocated where most needed, risk mitigation measures effectiveness is checked and safety levels are improved**
- **States are responsible for establishing an SSP.**

Remember “safety concept”:

- The state in which risks associated with aviation activities, related to, or in direct support of the operation of aircraft, are reduced and controlled to an acceptable level.

Role in SSP & SMS implementation

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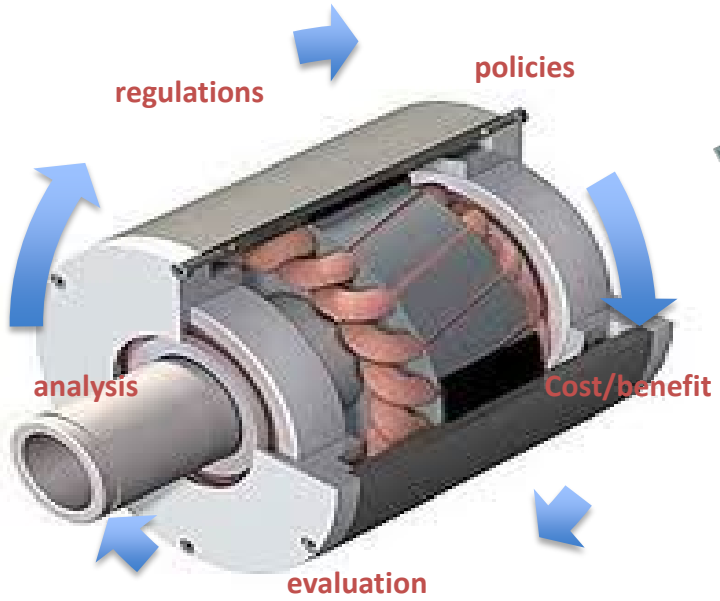
Input

Data
- ✓ Operational
- ✓ MOR/VOR
- ✓ Inspections
- ✓ Financial
- ✓ Accidents
- ✓ Complaints...



Output

Strategic decisions

Implementation programmes
- ✓National Aviation Safety Plan
- ✓Annual Surveillance Plan
- ✓Regulation
- ✓Safety campaigns...

SSP

Role in SSP & SMS implementation

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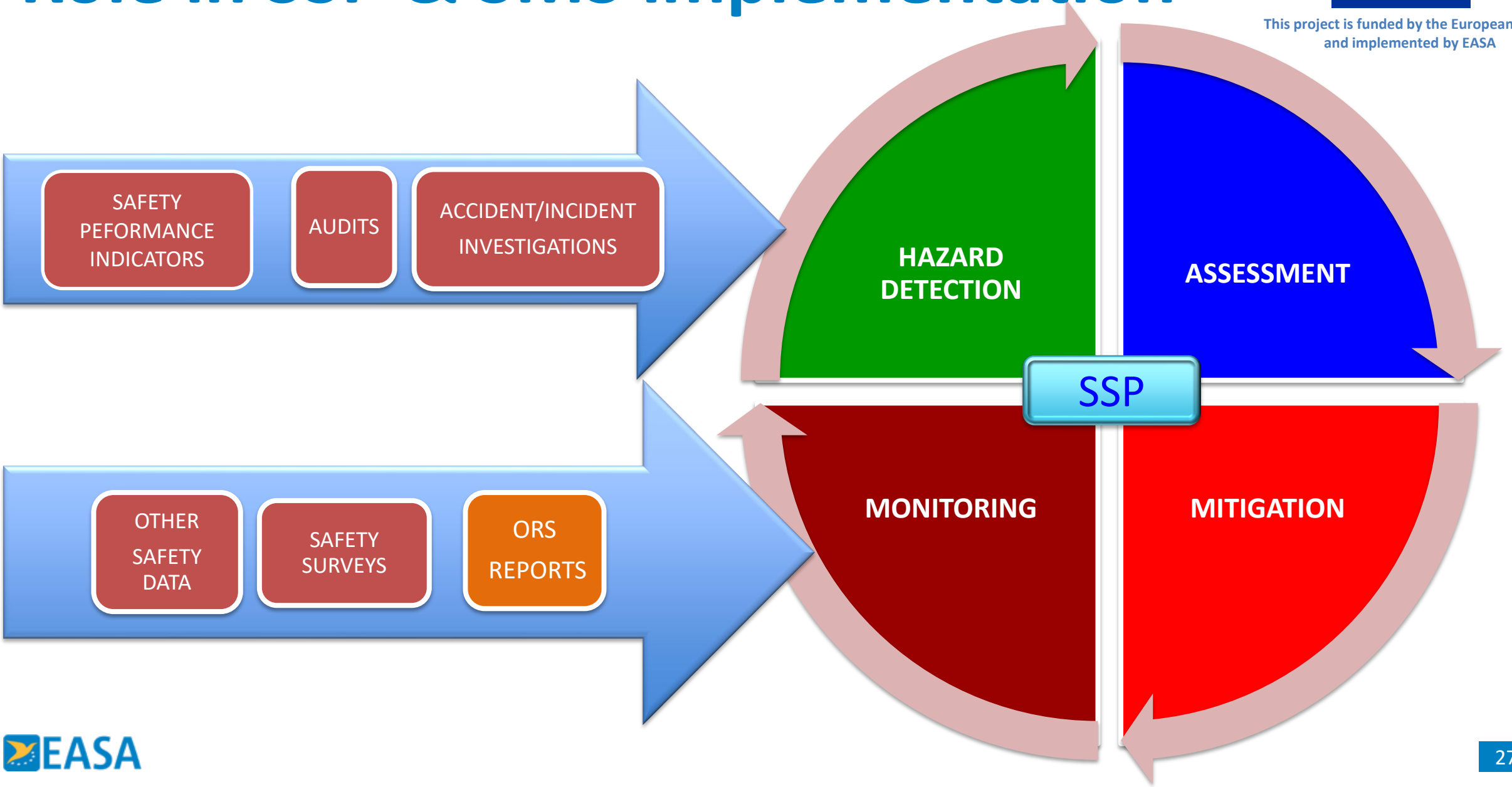

Role in SSP & SMS implementation

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→ **Safety management system (SMS):** A systematic approach to managing safety, including the necessary organizational structures, accountability, responsibilities, policies and procedures.

- The purpose of an SMS is to provide service providers with a **systematic approach to managing safety**
- The SMS seeks to **proactively** mitigate safety risks before they result in aviation accidents and incidents
- An effective SMS demonstrates to States the **service provider's ability to manage safety risks** and provides for effective management of safety at the State level

Role in SSP and SMS implementation

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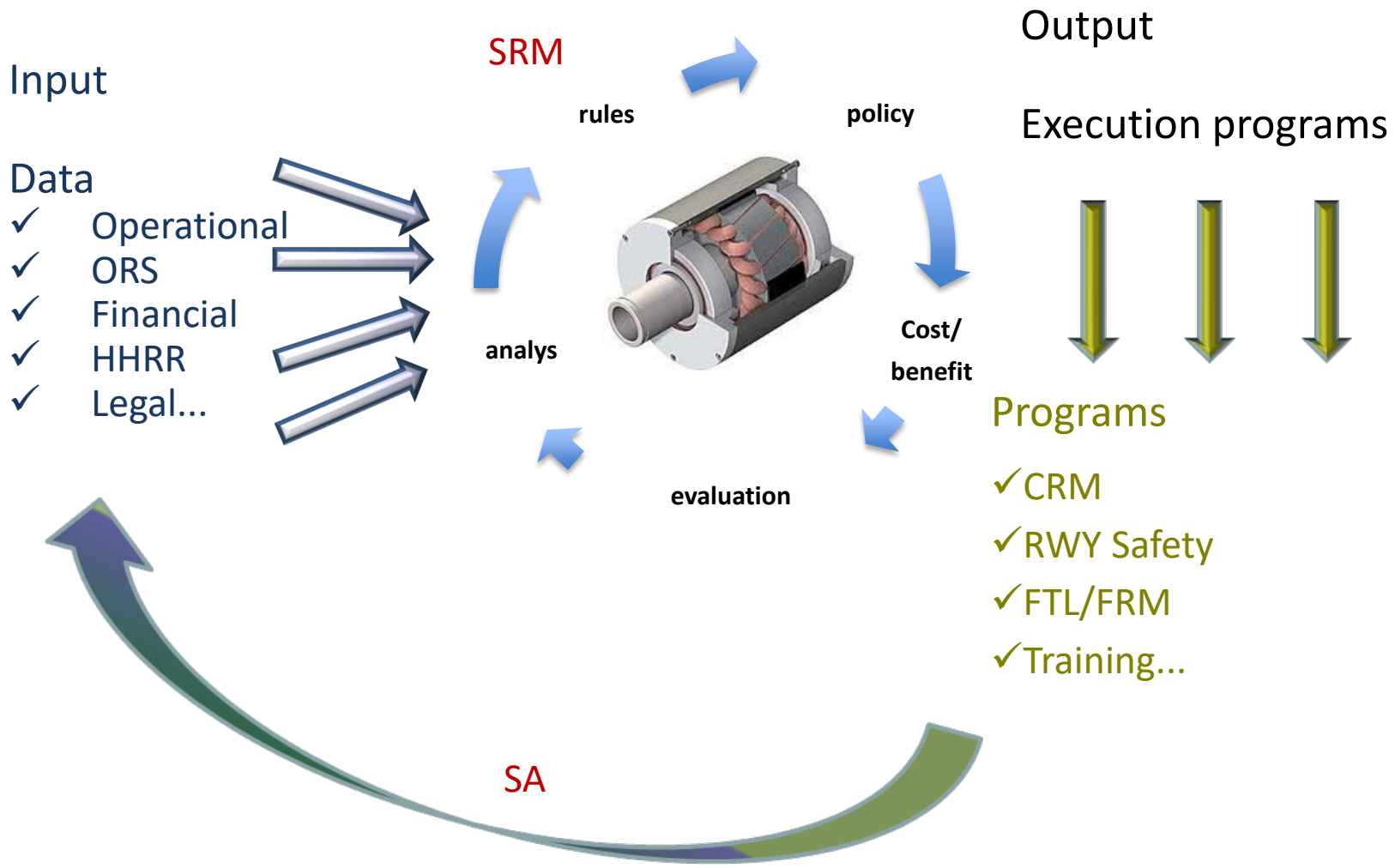

Role in SSP and SMS implementation

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The Basics of SMS

Role in SSP and SMS implementation

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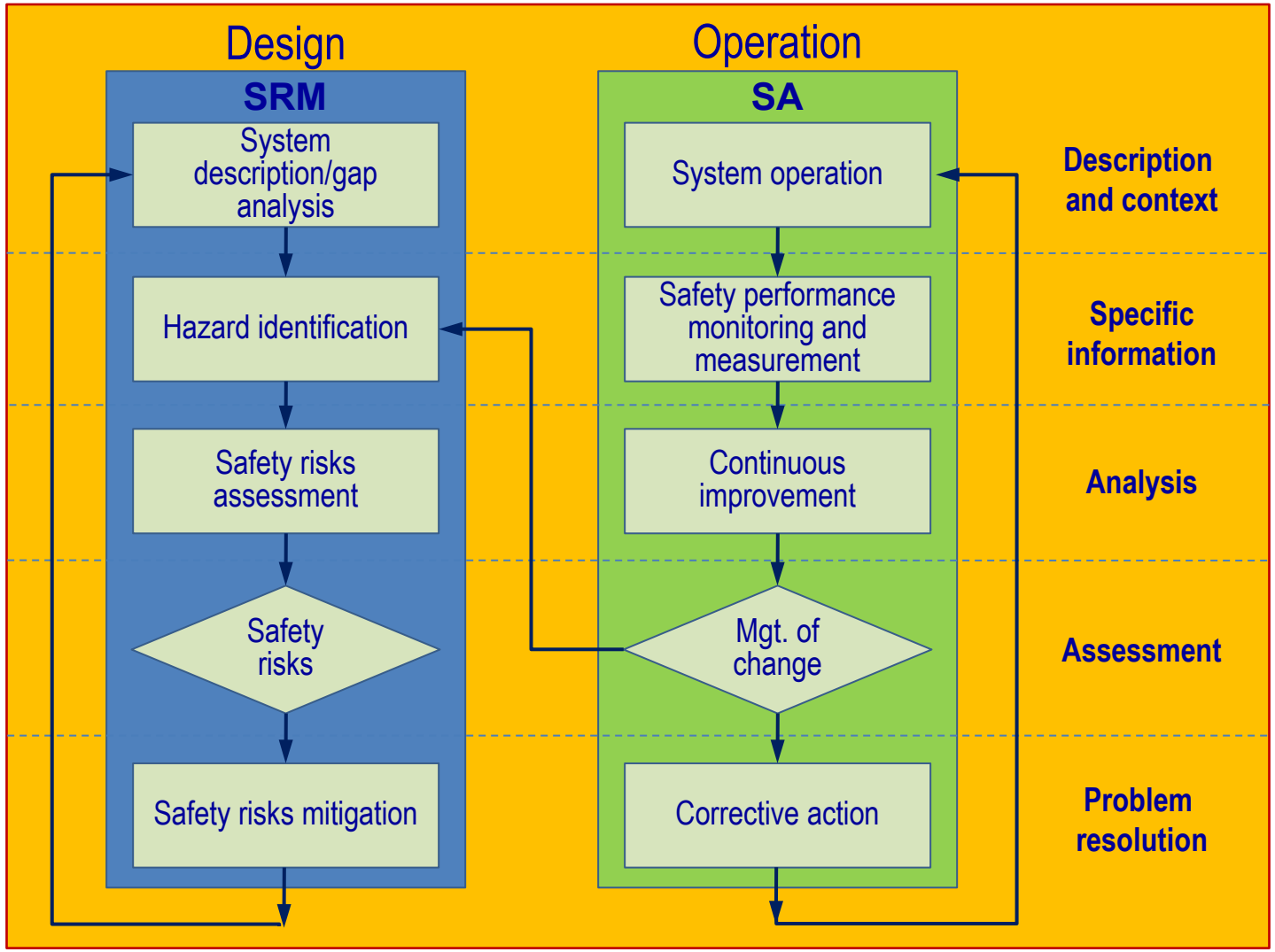

Role in SSP and SMS implementation

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→ Safety Cloud

RMA
Aircraft Registration

SNS
Occurrence Reporting System

SAECO
Airline Economic Analysis System

PALESTRA - ENAIRE
Flight Plans Spain

SILOA
Air Operator Licensing System

NMIR - EUROCONTROL
Network Manager
Interactive Reporting

FDM

...

SIPA – ISA
Inspections Results

PISO
SPIs

LPV
FCL

SRIS2
Safety Recommendations Information System

Role in SSP and SMS implementation

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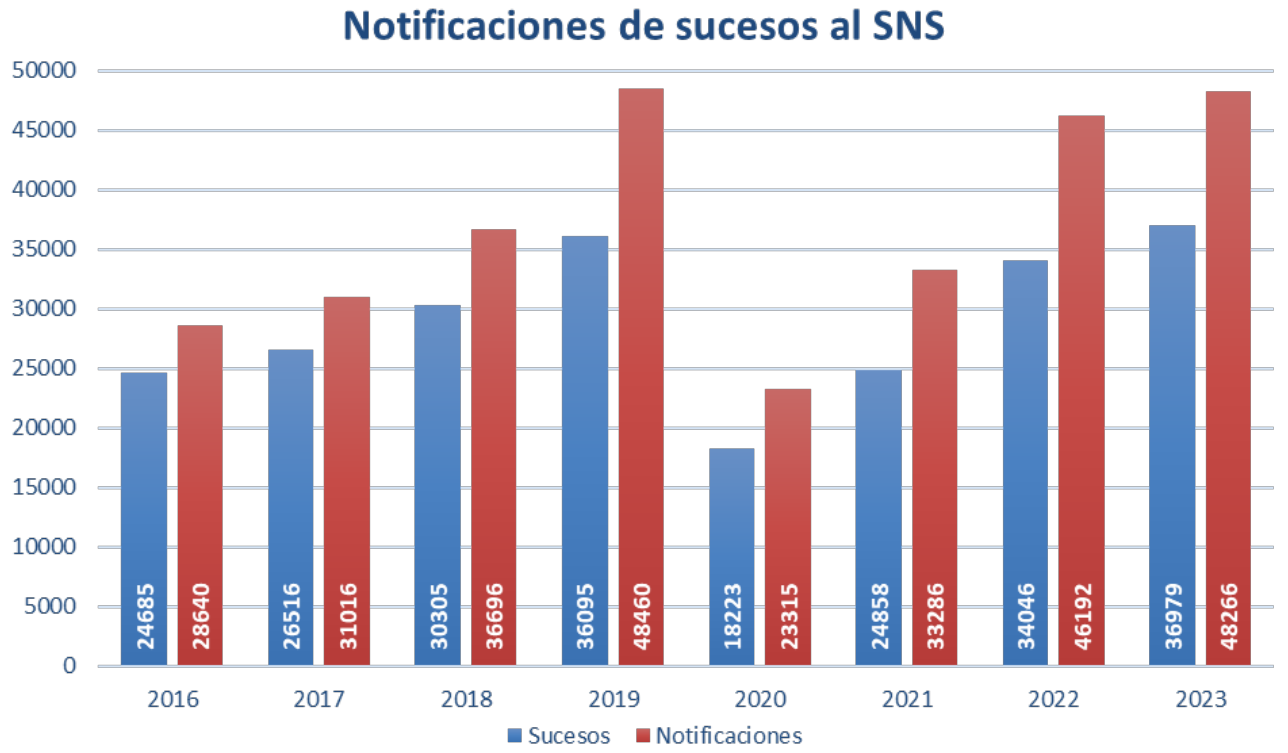

More than 400,000 notifications

More than 300,000 occurrences

Module 2: Legislative Framework & Reg.

- → ICAO SARPS (Annex 19 overview)
- → EU BASIC REGULATION
- → EU 376/2014 and associated regulations
- → Responsibilities of operators (national/foreign), organisations, and authorities

ICAO SARPS

ICAO Annex 19

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3.3.4 Hazard identification and safety risk assessment

3.3.4.1 States shall establish and maintain a process to identify hazards from collected safety data.

Note 1. — Further information regarding safety data collection, analysis and the sharing and exchange of safety information can be found in Chapter 5.

Note 2.— Additional information to identify hazards and safety issues on which to base preventive actions may be contained in the Final Reports of accidents and incidents.

3.3.4.2 States shall develop and maintain a process that ensures the assessment of safety risks associated with identified hazards.

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ICAO Annex 19 (NEW)

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3.3.4 Hazard identification and safety risk assessment

3.3.4.1 States shall establish and maintain a process to identify hazards at the State level from collected safety data and safety information.

~~*Note 1.— Further information regarding safety data collection, analysis and the sharing and exchange of safety information can be found in Chapter 5.*~~

Note ~~2~~.— Additional information to identify hazards and safety issues on which to base preventive actions may be contained in the Final Reports of accidents and incidents.

3.3.4.2 States shall develop and maintain a process that ensures the assessment of safety risks associated with ~~identified~~ hazards identified at the State level.

Note.— Additional provisions related to safety intelligence that support the identification of hazards at the State level and the assessment of associated safety risks can be found in 5.2 and 5.3.

3.3.4.3 **Recommendation.**— *States should periodically review hazards and associated safety risks related to emerging issues across their civil aviation system.*

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5.1 Safety data collection and processing systems

5.1.1 States shall establish safety data collection and processing systems (SDCPS) to capture, store, aggregate and enable the analysis of safety data and safety information.

Note 1.— SDCPS refers to processing and reporting systems, safety databases, schemes for exchange of information, and recorded information including but not limited to:

a) data and information pertaining to accident and incident investigations;

b) data and information related to safety investigations by State authorities or aviation service providers;

c) mandatory safety reporting systems as indicated in 5.1.2;

d) voluntary safety reporting systems as indicated in 5.1.3; and

e) self-disclosure reporting systems, including automatic data capture systems, as described in Annex 6, Part I, Chapter 3, as well as manual data capture systems.

Note 2.— Guidance related to SDCPS is contained in the Safety Management Manual (SMM) *(Doc 9859).*

Note 3.— The term "safety database" may refer to a single or multiple database(s).

Note 4.— SDCPS may include inputs from State, industry and public sources, and may be based on reactive and proactive methods of safety data and safety information collection.

Note 5.— Sector-specific safety reporting provisions are contained in other Annexes, PANS and SUPPs. There is a recognized benefit to the effective implementation of an SSP in having an integrated approach for the collection and analysis of the safety data and safety information from all sources.

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ICAO Annex 19 (NEW)

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5.~~1~~2 Safety data collection and processing systems

5.~~1~~2.1 States shall establish a safety data collection and processing ~~systems~~ system (SDCPS) consisting of a series of integrated processes and schemes to capture, store, aggregate, process and enable the analysis of safety data and safety information.

~~*Note 1.— SDCPS refers to processing and reporting systems, safety databases, schemes for exchange of information and recorded information including but not limited to:*~~

~~*a) data and information pertaining to accident and incident investigations;*~~

~~*b) data and information related to safety investigations by State authorities or aviation service providers;*~~

~~*c) mandatory safety reporting systems as indicated in 5.1.2;*~~

~~*d) voluntary safety reporting systems as indicated in 5.1.3; and*~~

~~*e) self disclosure reporting systems, including automatic data capture systems, as described in Annex 6, Part I, Chapter 3, as well as manual data capture systems.*~~

Note 1.— The SDCPS may also include some analysis functions.

Note 2.— Guidance related to an SDCPS is contained in ~~*the*~~ ~~Safety Management Manual (SMM)~~ ~~*(Doc 9859)*~~ *the* Safety Intelligence Manual *(Doc 10159).*

~~*Note 3.— The term "safety database" may refer to a single or multiple database(s).*~~

~~*Note 4.— SDCPS may include inputs from State, industry and public sources, and may be based on reactive and proactive methods of safety data and safety information collection.*~~

~~*Note 5.— Sector specific safety reporting provisions are contained in other Annexes, PANS and SUPPs. There is a recognized benefit to the effective implementation of an SSP in having an integrated approach for the collection and analysis of the safety data and safety information from all sources.*~~

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5.1.2 States shall establish a mandatory safety reporting system that includes the reporting of incidents.

5.1.3 States shall establish a voluntary safety reporting system to collect safety data and safety information not captured by mandatory safety reporting systems.

5.1.4 **Recommendation.**— *State authorities responsible for the implementation of the SSP should have access to the SDCPS as referenced in 5.1.1 to support their safety responsibilities, in accordance with the principles in Appendix 3.*

Note.— State authorities responsible for the implementation of the SSP include accident investigation authorities.

5.1.5 **Recommendation.**— *The safety database should use standardized taxonomy to facilitate safety information sharing and exchange.*

Note.— States are encouraged to use an ADREP-compatible system. More information on ADREP can be found in Annex 13, Chapter 7.

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ICAO Annex 19 (NEW)

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~~5.1.2 States shall establish a mandatory safety reporting system that includes the reporting of incidents.~~

5.2.2 States shall ensure that the SDCPS is based on both proactive and reactive methods of safety data and safety information collection.

Note.— An SDCPS may include inputs from State, industry and public sources. Additional guidance on methods of safety data and safety information collection are contained in the Safety Intelligence Manual *(Doc 10159).*

5.2.3 States shall ensure that the safety data and safety information collected through mandatory safety reporting systems are incorporated into the SDCPS.

Note.— The SDCPS includes mandatory safety reporting systems established by the State in accordance with sector-specific provisions contained in other Annexes, Procedures for Air Navigation Services (PANS) and supporting guidance material. In addition, Annex 13 contains information on accident/incident data reporting (ADREP). Examples of mandatory safety reporting systems are contained in the Safety Intelligence Manual *(Doc 10159).*

5.~~1.3~~2.4 States shall establish a voluntary safety reporting system to collect safety data and safety information not captured by mandatory safety reporting systems.

ICAO SARPS

ICAO Annex 19 (NEW)

~~5.1.4 **Recommendation**. — *State authorities responsible for the implementation of the SSP should have access to the SDCPS as referenced in 5.1.1 to support their safety responsibilities, in accordance with the principles in Appendix 3.*~~

5.2.5 State authorities responsible for the implementation of the SSP shall contribute and have access to safety data and safety information in the SDCPS to support their safety responsibilities.

Note 1.— State authorities responsible for the implementation of the SSP include accident investigation authorities.

Note 2.— Provisions related to the protection of safety data captured by, and safety information derived from, voluntary safety reporting systems can be found in 5.4.1. Provisions related to the protection of safety data captured by, and safety information derived from, mandatory safety reporting systems can be found in Recommendation 5.4.2.

~~5.1.5 **Recommendation**. — *The safety database should use standardized taxonomy to facilitate safety information sharing and exchange.*~~

5.2.6 States shall use a taxonomy for safety reporting that is aligned with standardized taxonomies and that facilitates the:

a) identification of hazards at the State level as referenced in 3.3.4;

b) consistent comparison of safety data and safety information; and

c) sharing and exchange of safety information as referenced in 5.5.

Note.— ~~States are encouraged to use an~~ Guidance related to standardized taxonomies including, but not limited to ADREP taxonomy, is contained in the Safety Intelligence Manual *(Doc 10159).~~ ~~compatible system. More information on ADREP can be found in Annex 13, Chapter 7.~~*

5.2.7 **Recommendation**.— *States should establish a means for the governance of safety data and safety information.*

Note.— Further guidance on safety data governance is contained in the Safety Intelligence Manual *(Doc 10159).*

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ICAO SARPS

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5.2 Safety data and safety information analysis

5.2.1 States shall establish and maintain a process to analyse the safety data and safety information from the SDCPS and associated safety databases.

Note 1.— Specific State provisions for the identification of hazards as part of their safety risk management and safety assurance processes can be found in Chapter 3.

Note 2.— The purpose of the safety data and safety information analysis performed by the State is to identify systemic and cross-cutting hazards that might not otherwise be identified by the safety data analysis processes of individual service providers and operators.

Note 3.— The process may include predictive methods of safety data analysis.

ICAO SARPS

ICAO Annex 19 (NEW)

5.~~2~~3 Safety data and safety information analysis

5.~~2~~3.1 States shall establish and maintain ~~a~~ processes to analyse ~~the~~ safety data and safety information from the SDCPS ~~and associated safety databases~~. The processes shall include a variety of analysis methods to support the:

a) development of safety performance indicators, as referenced in 3.4.2.1;

b) identification of hazards at the State level, as referenced in 3.3.4;

c) identification of existing practices and operational strategies that resulted in positive safety outcomes; and

d) development of safety intelligence.

~~*Note 1.— Specific State provisions for the identification of hazards as part of their safety risk management and safety assurance processes can be found in Chapter 3.*~~

~~*Note 2.— The purpose of the safety data and safety information analysis performed by the State is to identify systemic and cross-cutting hazards that might not otherwise be identified by the safety data analysis processes of individual service providers and operators.*~~

~~*Note 3.— The process may include predictive methods of safety data analysis.*~~

Note 1.— Data and information from non-safety sources (for example, weather, terrain or security) may be included in the processes to support a more integrated analysis at the State level.

Note 2.— Guidance on different types of analyses that can be conducted and the competencies required to conduct such analyses are contained in the Safety Intelligence Manual *(Doc 10159).*

EU BASIC REGULATION

This project is funded by the European Union and implemented by EASA

REGULATION (EU) 2018/1139 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL

of 4 July 2018

Art 72. Information gathering, exchange and analysis

Information Exchange: The EC, the EASA, and NCAs must share relevant information for their tasks under the Regulation.
Information Use: Entities involved in civil aviation accident investigations or occurrence analysis are entitled to access this information.
Coordination by EASA: EASA coordinates at the EU level the gathering, exchange, and analysis of information.
Implementing Acts: The Commission will adopt acts detailing rules for information exchange and dissemination to interested parties, protecting against misuse for attributing blame or liability.
Confidentiality: Measures are in place to ensure confidentiality of received information, adhering to both Union and national laws.

EU BASIC REGULATION

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REGULATION (EU) 2018/1139 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL

of 4 July 2018

Art 73. Protection of the source of information

Source Protection: When information is provided, the source must be protected in line with Union and national laws related to civil aviation safety. Personal details of natural persons providing information to the EC or EASA must not be recorded or revealed.

Legal Proceedings: MMSS must not initiate proceedings for unpremeditated or inadvertent legal infringements reported under this Regulation, except in cases of wilful misconduct, severe disregard for obvious risks, or profound professional negligence causing damage or seriously compromising aviation safety.

Enhanced Measures: Member States can implement stronger measures to protect information sources.

Non-prejudice Clause: Employees and contractors providing information are protected from prejudice by their employers based on the information given, except in cases of wilful misconduct or severe professional failures as described.

Regulatory Actions: This Art. does not restrict actions necessary for maintaining or improving civil aviation safety.

EU BASIC REGULATION

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REGULATION (EU) 2018/1139 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL

of 4 July 2018

Art 74. Repository of information

Repository Establishment: The EASA, in cooperation with the EC and NCAs, will establish and manage a repository of information necessary for effective cooperation in certification, oversight, and enforcement tasks under this Regulation.
Data Protection and Privacy: Personal data in the repository will be protected according to EU data protection laws, stored only as long as necessary, and measures will be in place to inform data subjects about the processing of their data.
Access to Information: Online and secure access to the repository will be available for EASA, the EC, NCAs, and other authorised entities. Public availability of certain information will be maintained, and access to sensitive personal data will be strictly controlled.

Basic Regulation 2018/1139

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REGULATION (EU) 2018/1139 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL

of 4 July 2018

Article 123. Security rules on the protection of classified and sensitive non-classified information

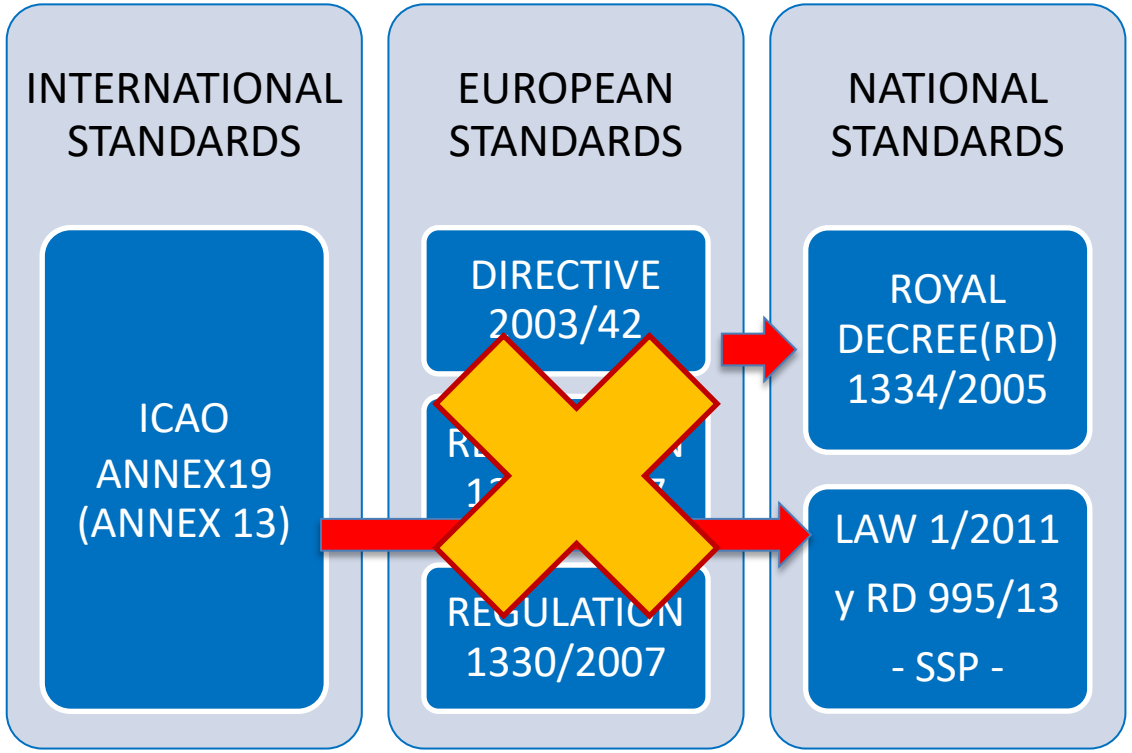
- EASA must adopt rules to protect EU classified and sensitive unclassified information.

Article 132. Processing of personal data

- States must exercise their functions in accordance with national provisions or Regulation (EU) 2016/679.
- EC and EASA must exercise their functions in accordance with Regulation (EC) No 45/2001.

EU 376/2014 & associated regulations

This project is funded by the European Union and implemented by EASA



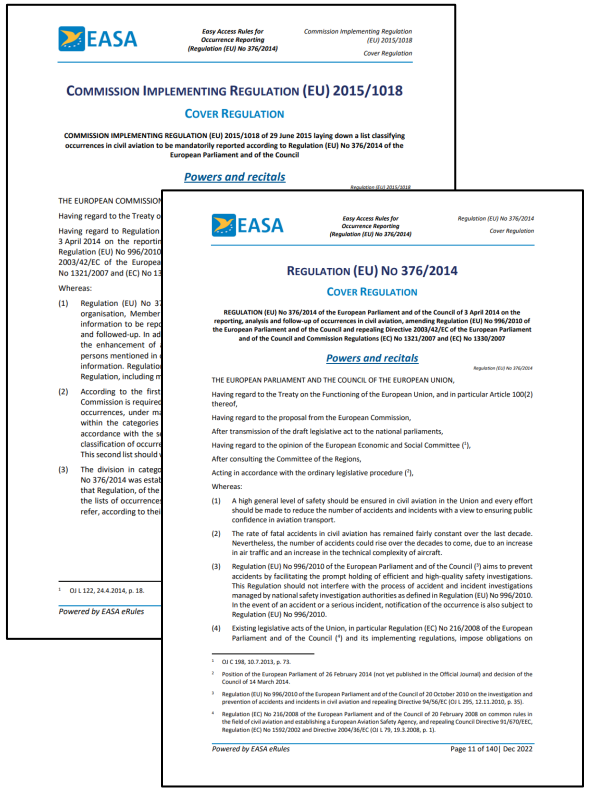
- **European Regulation 376/14** replaced the Directive and Regulations (EC) No 1321/2007 and (EC) No 1330/2007 (15 November 2015).

EU 376/2014 & associated regulations

This project is funded by the European Union and implemented by EASA

ICAO

Link



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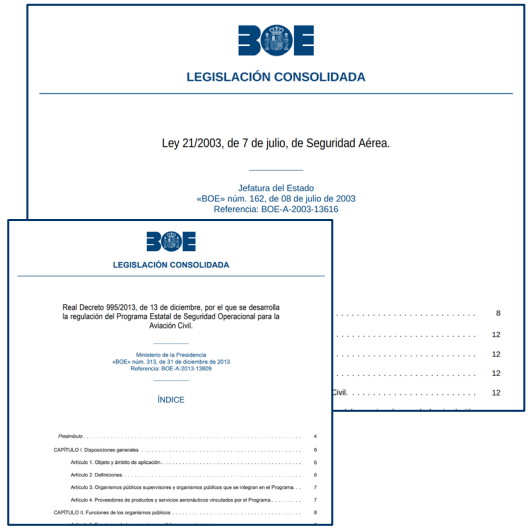

EU 376/2014 & associated regulations

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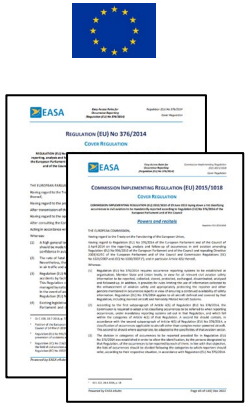

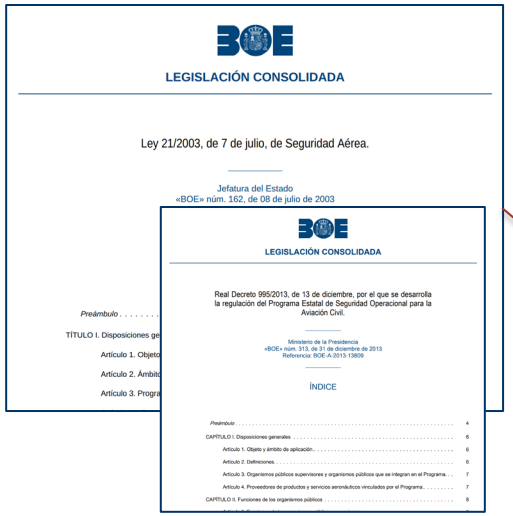

AESA is designated as the National Authority for the management of the national ORS.

DGAC Spain is designated as the Authority in charge of ensuring the implementation of the Just Culture.

Extension of Reg (EU) 376/2014 to non-EASA activities:
- Fire fighting
- Search and rescue

Establishes cooperation mechanisms between national authorities and service providers/aviation professionals.

Establishes mechanisms for cooperation between civil and military aviation authorities.

Protection of information and related sources

EU 376/2014 & associated regulations

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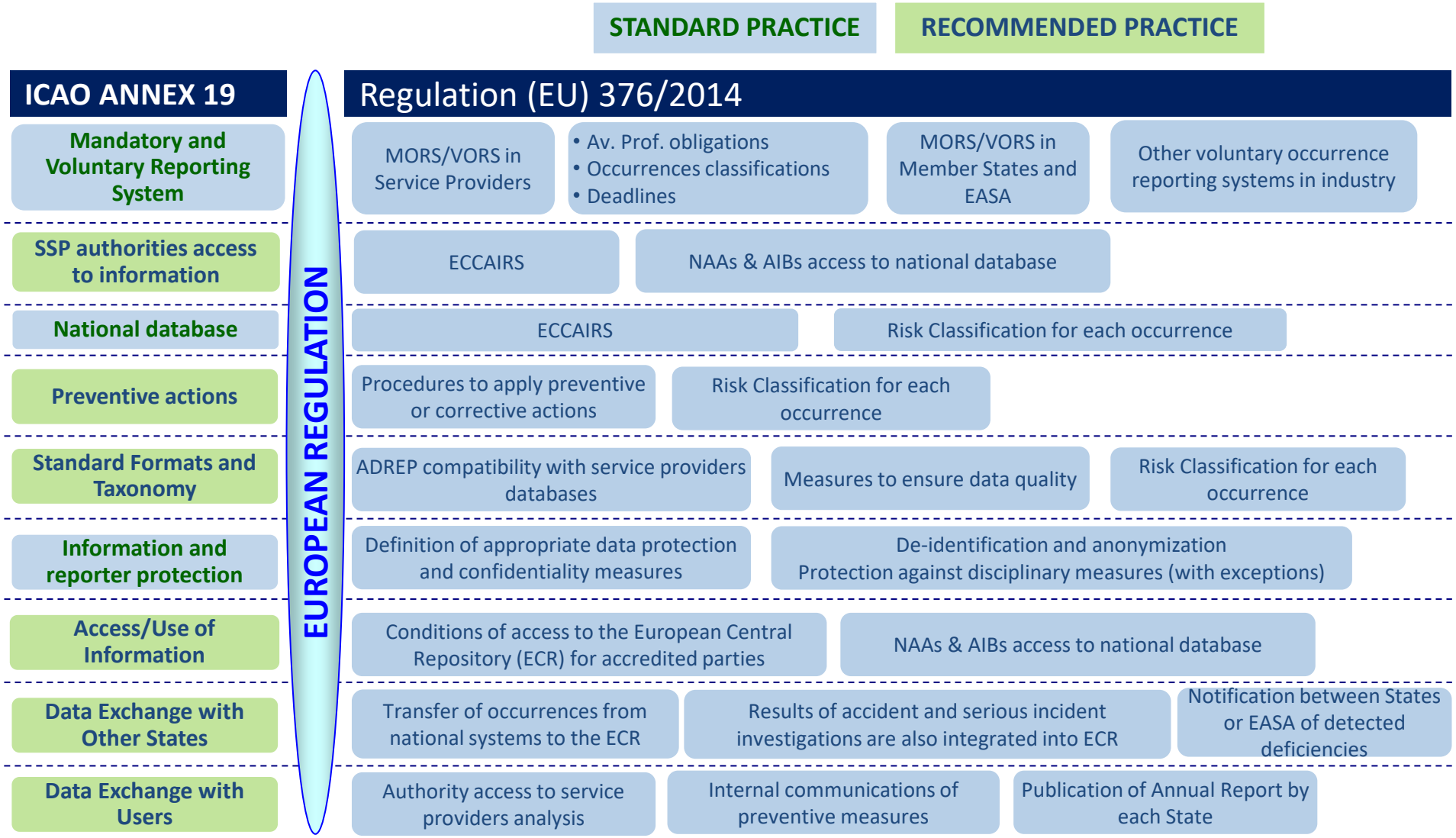

Subject matter and scope

This project is funded by the European Union and implemented by EASA

Article 3

Subject matter and scope

1. This Regulation lays down rules on:

(a) the reporting of occurrences which endanger or which, if not corrected or addressed, would endanger an aircraft, its occupants, any other person, equipment or installation affecting aircraft operations; and the reporting of other relevant safety-related information in that context;

(b) analysis and follow-up action in respect of reported occurrences and other safety-related information;

(c) the protection of aviation professionals;

(d) appropriate use collected safety information;

(e) the integration of information into the European Central Repository; and

(f) the dissemination of anonymised information to interested parties for the purpose of providing such parties with the information they need in order to improve aviation safety.

2. This Regulation applies to occurrences and other safety-related information involving civil aircraft, with the exception of aircraft referred to in Annex II to Regulation (EC) No 216/2008. Member States may decide to apply this Regulation also to occurrences and other safety-related information involving the aircraft referred to in Annex II to that Regulation.

(7) 'occurrence' means any safety-related event which endangers or which, if not corrected or addressed, could endanger an aircraft, its occupants or any other person and includes in particular an accident or serious incident;

Subject matter and scope

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- CHARACTERISTICS OF THE ORS

  - CONFIDENTIAL (BUT NOT ANONYMOUS)
  - MANDATORY AND VOLUNTARY
  - NON-PUNITIVE (EXCEPT FOR WILFUL MISCONDUCT OR GROSS NEGLIGENCE)

Subject matter and scope

This project is funded by the European Union and implemented by EASA

Definition of occurrence
any **safety-related event** which **endangers** or which, if not corrected or addressed, could endanger **an aircraft, its occupants or any other person** and **includes** in particular an **accident or serious incident;**

Possible occurrence

Is it a serious incident or accident?

MANDATORY NOTIFICATION TO AIB

MANDATORY NOTIFICATION TO AESA'S MORS

Occurrence type included in the list of mandatory reportable occurrences?

MANDATORY NOTIFICATION TO AESA'S MORS

Type of occurrence included in priority areas identified by SMS organisation?

MANDATORY NOTIFICATION TO AESA'S MORS

Regulation (UE) 1018/2015

Is the occurrence considered relevant to aviation safety?

VOLUNTARY NOTIFICATION TO AESA'S VORS

The occurrence does not need to be reported

Subject matter and scope

This project is funded by the European Union and implemented by EASA

→ ORS – Occurrence Reporting System

→ Organisations are the first source of safety issue identification for aviation.

If an SMS has identified something relevant to safety,
it can be useful for the whole industry.

→ By reporting an occurrence to AESA's ORS, the identification of a safety issue is shared in a protected manner with the rest of the aviation industry.

- ✓ The **ORS monitors its evolution** with the reporter and the rest of the industry.
- ✓ The ORS has **more sources of information** ("reporters") that provide their assessment in the estimation of risk and a context for the events.
- ✓ The ORS has a record of occurrences and **can be aware that the same circumstances** in another environment or conditions **have posed a safety risk**.

Subject matter & scope (in practice)

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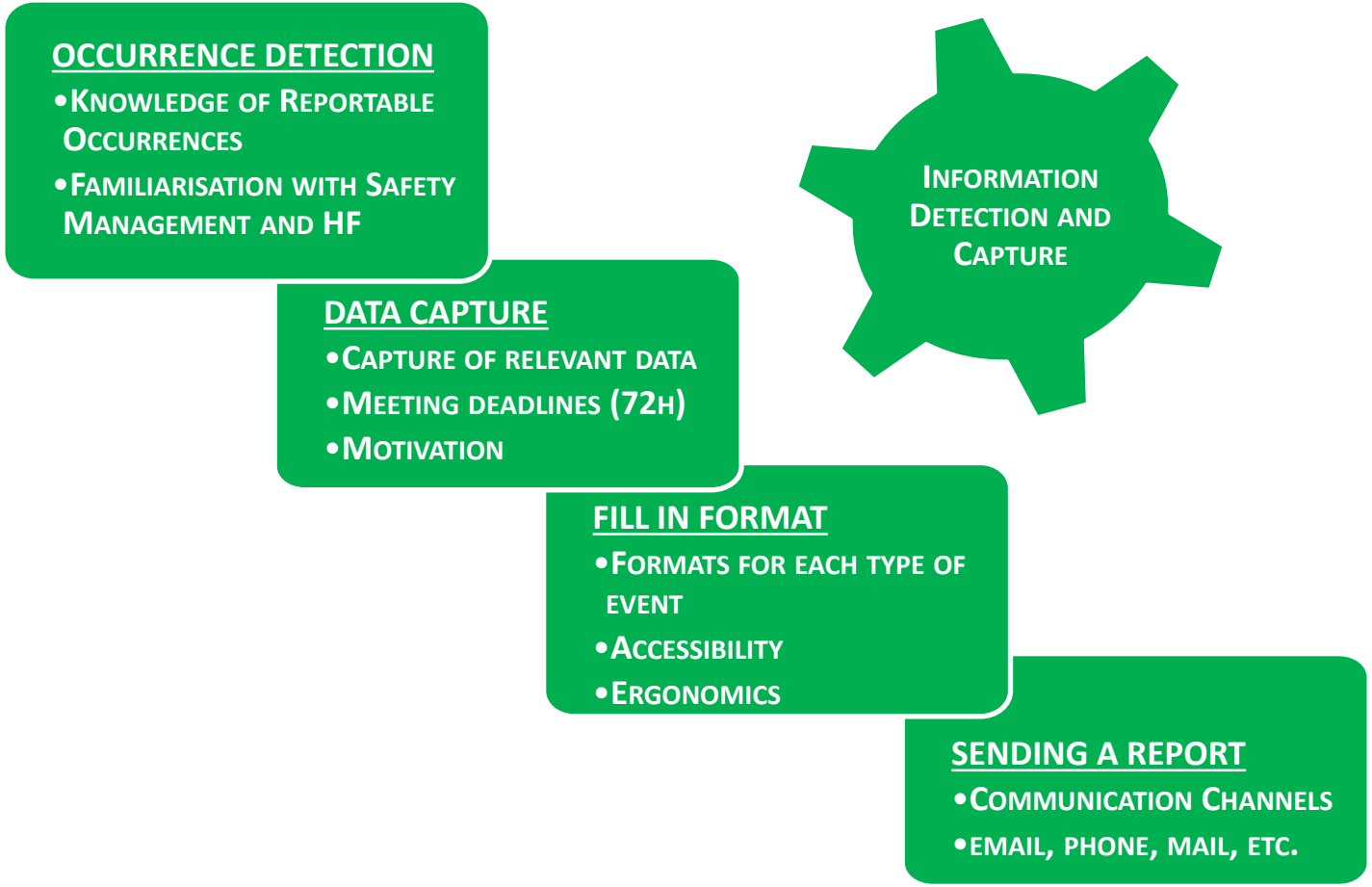

Subject matter & scope (in practice)

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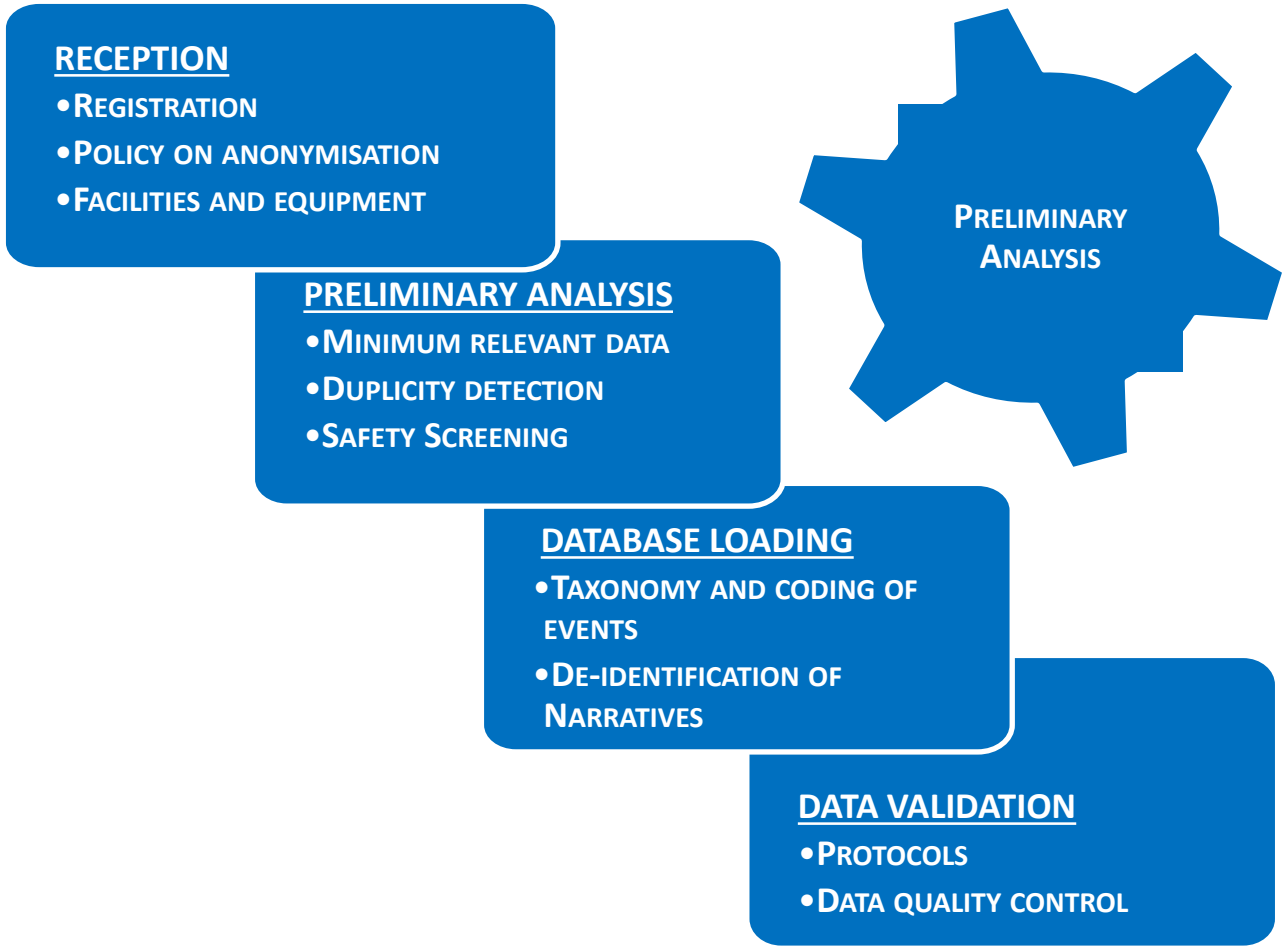

Subject matter & scope (in practice)

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Relationship with other regulations

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Recital

Reg.(EU) 2018/1139

(4) Existing legislative acts of the Union, in particular Regulation (EC) No 216/2008 of the European Parliament and of the Council (4) and its implementing regulations, impose obligations on certain organisations to establish occurrence reporting systems in the context of their safety management systems. Compliance with Regulation (EC) No 216/2008 and its implementing regulations should not exempt organisations from compliance with this Regulation. Likewise, compliance with this Regulation should not exempt organisations from compliance with Regulation (EC) No 216/2008 and its implementing regulations. However, this should not give rise to two parallel reporting systems, and Regulation (EC) No 216/2008, its implementing regulations, and this Regulation should be seen as complementary.

Relationship with other regulations

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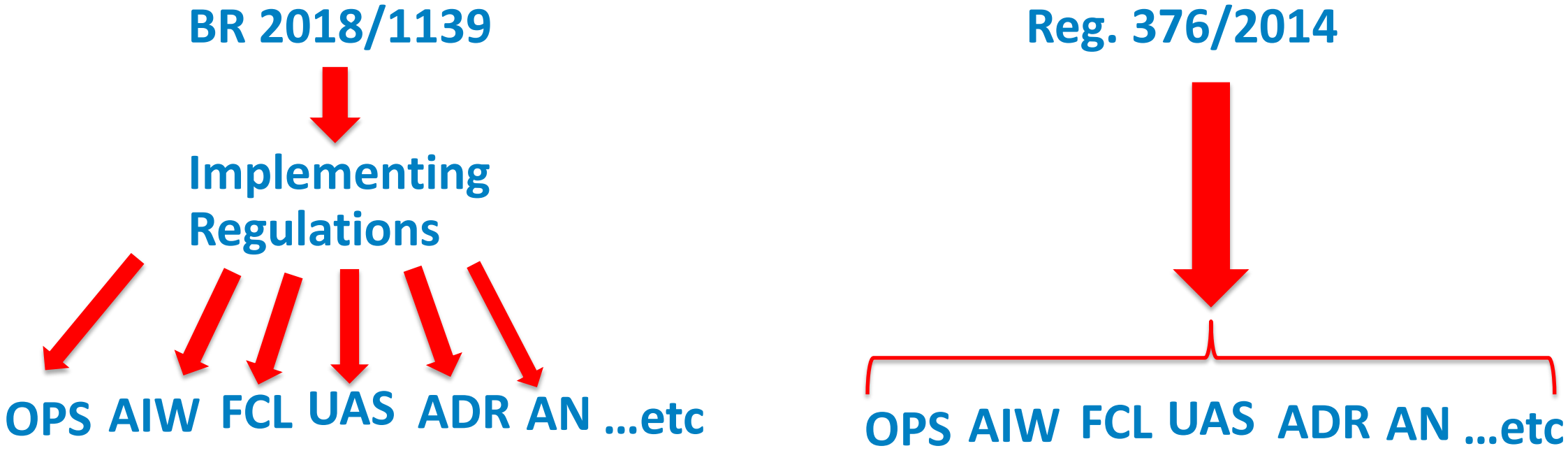

Relationship with other regulations

This project is funded by the European Union and implemented by EASA

COMMISSION DELEGATED REGULATION (EU) 2024/1400

of 13 March 2024

amending Regulation (EU) No 139/2014 as regards aerodrome safety, change of aerodrome operator and occurrence reporting

'ADR.OR.C.030 Occurrence reporting

(a) As part of its management system, the aerodrome operator shall establish and maintain an occurrence-reporting system, including mandatory and voluntary reporting. The aerodrome operator shall ensure that the system complies with the applicable requirements of Regulation (EU) No 376/2014 and Regulation (EU) 2018/1139, as well as with the delegated and implementing acts adopted on the basis of those Regulations.

(b) The aerodrome operator shall report to the competent authority and to any other organisation required to be informed by the Member State any safety-related event or condition that endangers or, if not corrected or addressed, could endanger an aircraft, its occupants, or any other person, and in particular any accident or serious incident.

(c) In addition to reports submitted in accordance with point (b), the aerodrome operator shall report to the competent authority and the organisation responsible for the design of the aerodrome equipment any malfunction, technical defect, exceedance of technical limitations, occurrence or other irregular circumstance that has or may have endangered an aircraft, its occupants or any other person and has not resulted in an accident or serious incident.

(d) Without prejudice to Regulation (EU) No 376/2014 and its delegated and implementing acts, reports referred to in point (c) shall:

(1) be made as soon as practicable, but in any case within 72 hours after the aerodrome operator has become aware of the event or condition to which the report relates, unless exceptional circumstances prevent that;

(2) be made in a form and manner established by the Competent Authority;

(3) contain all pertinent information about the condition known to the aerodrome operator.

(e) Notwithstanding Regulation (EU) No 376/2014 and its delegated and implementing acts, for reports required by point (c), the aerodrome operator shall submit a follow-up report providing details of actions that the aerodrome operator intends to take to prevent similar occurrences in the future. The follow-up report shall be submitted as soon as those actions have been identified and it shall:

(1) be sent to the relevant entities initially reported to in accordance with points (b) and (c);

(2) be made in a form and manner established by the Competent Authority.';

Other ORS-related regulations

This project is funded by the European Union and implemented by EASA

MANDATORY REPORTING SYSTEMS: WHAT MUST BE REPORTED?

- Depending on the field of activity, there is a list of occurrences that are expected to be reported by the notifier.

COMMISSION IMPLEMENTING REGULATION (EU) 2015/1018

of 29 June 2015

laying down a list classifying occurrences in civil aviation to be mandatorily reported according to Regulation (EU) No 376/2014 of the European Parliament and of the Council

- 5 annexes.

Other ORS-related regulations

This project is funded by the European Union and implemented by EASA

→ Applicable Regulation: CDR (EU) No 2020/2034

Benefits of having a common reference:

- Harmonisation of the classification of the risk level.
- Identification of common Key Risk Areas.
- Improve the common approach to risk management.

ERCS

Familiar format

- The ERCS is presented on a Severity/Probability layout which is commonplace on the industry, this eases its implementation by the authorities.

Other ORS-related regulations

This project is funded by the European Union and implemented by EASA

→ Applicable Regulation: CDR (EU) No 2020/2034

ERCS

2-Step process:

1) **Identification** of the severity of the potential accident outcome:
   a) Most likely type of accident that the occurrence under assessment could have escalated to (Key Risk Area) and the Potential Loss of Life
   b) Severity score (A, E, I, M, S, X)
2) **Determination** of the probability of the potential accident outcome:
   a) Identify which of the barriers (1-8) stopped the occurrence (stopping barrier) and the effectiveness of the remaining barriers (placed between the stopping barrier and the potential accident outcome)
   b) Sum of all the stopping/ remaining barrier weights (0-18) and barrier score (0-9)

Other ORS-related regulations

This project is funded by the European Union and implemented by EASA

SEVERITY		CLASSIFICATION (ERCS Score)										
Potential Accident Outcome	Score											
Extreme catastrophic accident with the potential for significant number of fatalities (100+)	X	X9	X8	X7	X6	X5	X4	X3	X2	X1		X0
Significant accident with potential for fatalities and injuries (20-100)	S	S9	S8	S7	S6	S5	S4	S3	S2	S1		S0
Major accident with limited amount of fatalities (2-19), life changing injuries or destruction of the aircraft	M	M9	M8	M7	M6	M5	M4	M3	M2	M1		M0
An accident involving single individual fatality, life changing injury or substantial aircraft damage	I	I9	I8	I7	I6	I5	I4	I3	I2	I1		I0
An accident involving minor and serious injury (not life changing) or minor aircraft damage	E	E9	E8	E7	E6	E5	E4	E3	E2	E1		E0
No likelihood of an accident	A	*No Implication to Safety*										
	Corresponding Barrier Score	9	8	7	6	5	4	3	2	1		0
	Barrier Weight Sum	17-18	15-16	13-14	11-12	9-10	7-8	5-6	3-4	1-2		0
		PROBABILITY OF THE POTENTIAL ACCIDENT OUTCOME										

Pending Risk Assessment

RED

High risk

Yellow

Elevated or intermediate risk

Green

Low risk occurrences

Other ORS-related regulations

This project is funded by the European Union and implemented by EASA

→ Applicable Regulation: CDR (EU) No 2020/2034

Numerical equivalent score:

ERCS Score	X9	X8	X7	X6	X5	X4	X3	X2	X1	X0
Corresponding numerical value	0,001	0,01	0,1	1	10	100	1000	10000	100000	1000000
ERCS Score	S9	S8	S7	S6	S5	S4	S3	S2	S1	S0
Corresponding numerical value	0,0005	0,005	0,05	0,5	5	50	500	5000	50000	500000
ERCS Score	M9	M8	M7	M6	M5	M4	M3	M2	M1	M0
Corresponding numerical value	0,0001	0,001	0,01	0,1	1	10	100	1000	10000	100000
ERCS Score	I9	I8	I7	I6	I5	I4	I3	I2	I1	I0
Corresponding numerical value	0,00001	0,0001	0,001	0,01	0,1	1	10	100	1000	10000
ERCS Score	E9	E8	E7	E6	E5	E4	E3	E2	E1	E0
Corresponding numerical value	0,000001	0,00001	0,0001	0,001	0,01	0,1	1	10	100	1000

Both column 10 and the row A in the matrix bear the value 0 as the corresponding numerical value.

Other ORS-related regulations

This project is funded by the European Union and implemented by EASA

Overview of Regulation (EU) 2021/2082

- **Purpose**: Implements the common European Risk Classification Scheme (ERCS) for aviation safety occurrences, in accordance with Regulation (EU) No 376/2014.
- **Key Requirements**:
  - Member States and the European Union Aviation Safety Agency (EASA) must collect, analyse, and report safety occurrences.
  - Harmonised classification of safety risks using ERCS is mandatory.
  - ERCS classifications ensure consistent risk assessment across Member States.
- **Implementation Date**: Effective from January 1, 2023.

Other ORS-related regulations

This project is funded by the European Union and implemented by EASA

Overview of Regulation (EU) 2021/2082

- **Risk Classification**:
  - Utilises direct and manual conversion methods from existing systems (e.g., ARMS-ERC and RAT).
  - Assigns two key scores: severity and probability of potential outcomes.
- **Monitoring and Improvement**:
  - Continuous review and reporting on ERCS usage by Member States and EASA.
  - Adjustments made based on expertise from safety analysts.
- **Compliance**:
  - It is mandatory for national aviation authorities and EASA to align with ERCS in occurrence reports.
  - Regular updates to maintain compatibility with other risk classification schemes.

Responsibilities of org. & authorities

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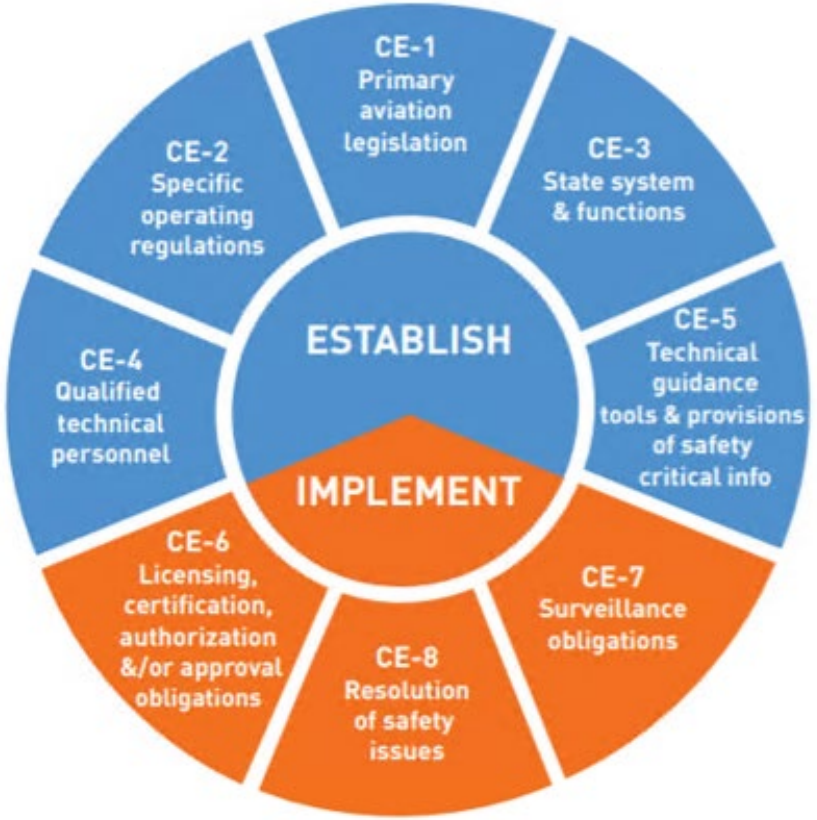
Annex 19, App. 1 – 8 Critical elements of a State's safety oversight system (Doc 9734)



Responsibilities of org. & authorities

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State Safety Management

Prescriptive

Annex 19
Appendix 1
+
Doc. 9734
Part A

+

Performance-Based

SSP

Responsibilities of org. & authorities

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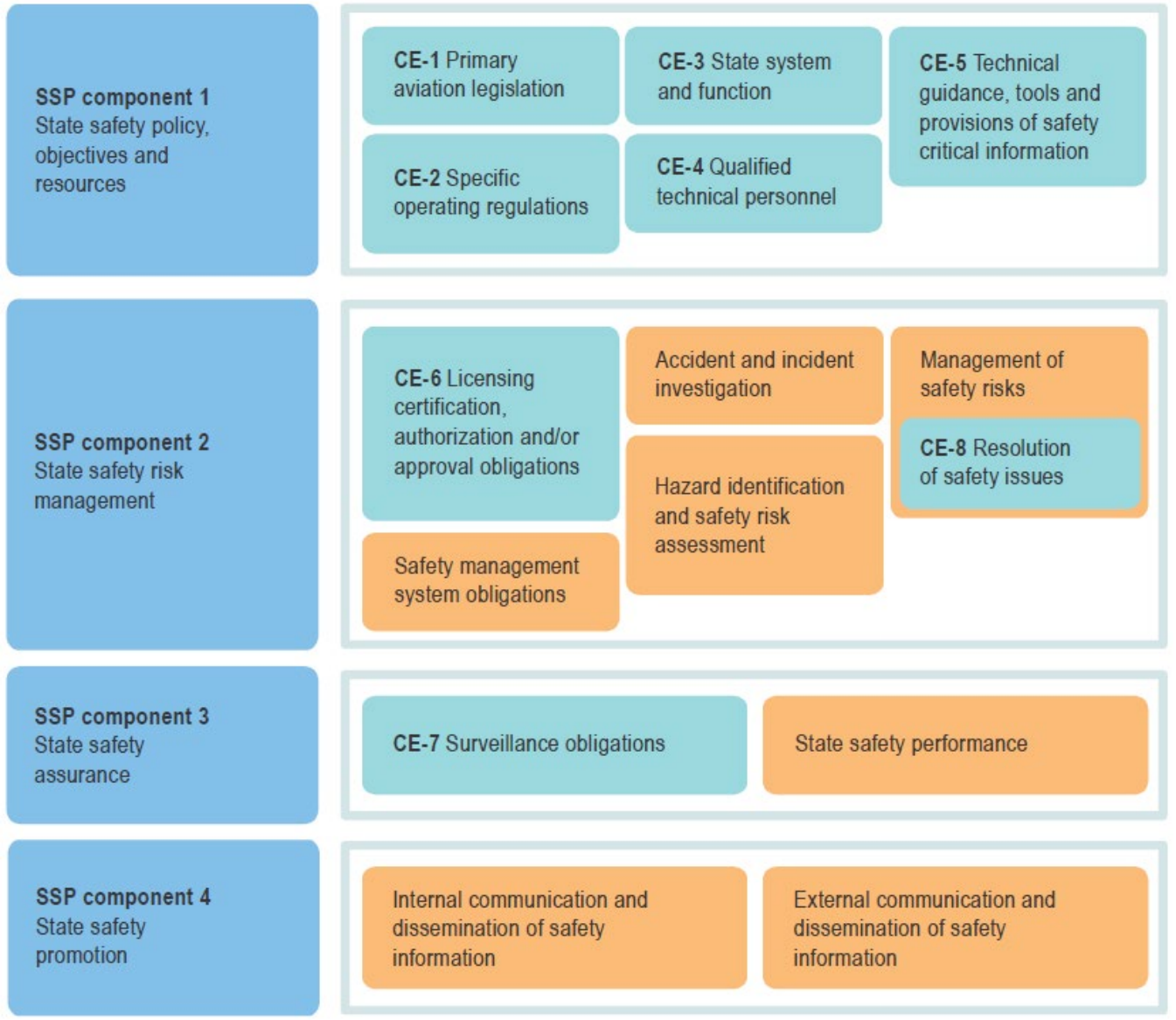

Responsibilities of org. & authorities

This project is funded by the European Union and implemented by EASA

As part of its SSP, each State shall require that the following service providers under its authority implement an SMS:

Approved training organizations that are exposed to safety risks during the provision of their services.	*Aircraft operators authorized to conduct international commercial air transport (CAT)*	*Approved maintenance organizations int. CAT*	*Organizations responsible for type design and/or manufacture of aircraft, engines or propellers*	*Air traffic services (ATS) providers.*	*Certified aerodromes (Annex 14,Vol I)*

As part of its SSP, the State of Registry shall establish criteria for international general aviation operators of large or turbojet aeroplanes to implement an SMS

Responsibilities of org. & authorities

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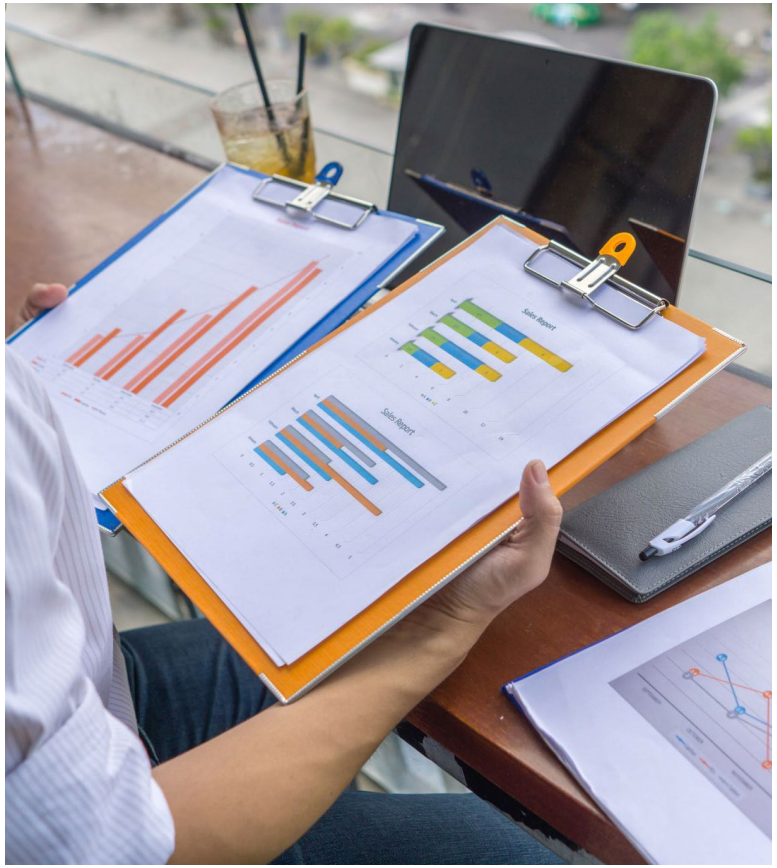

Organisations

- Mandatory reporting of occurrences by staff involved in aviation activities (Art. 4).
- Voluntary reporting systems should be implemented to capture additional safety information (Art. 5).
- Store occurrence reports in one or more databases compatible with the ECCAIRS software and the ADREP taxonomy (Art. 6.5 & 7,4).
- Establish internal reporting procedures that ensure confidentiality and promote just culture (Art. 6 & 16.11).
- Report to the competent authority or to EASA, depending on oversight responsibility (Art. 4.8-9).

Responsibilities of org. & authorities

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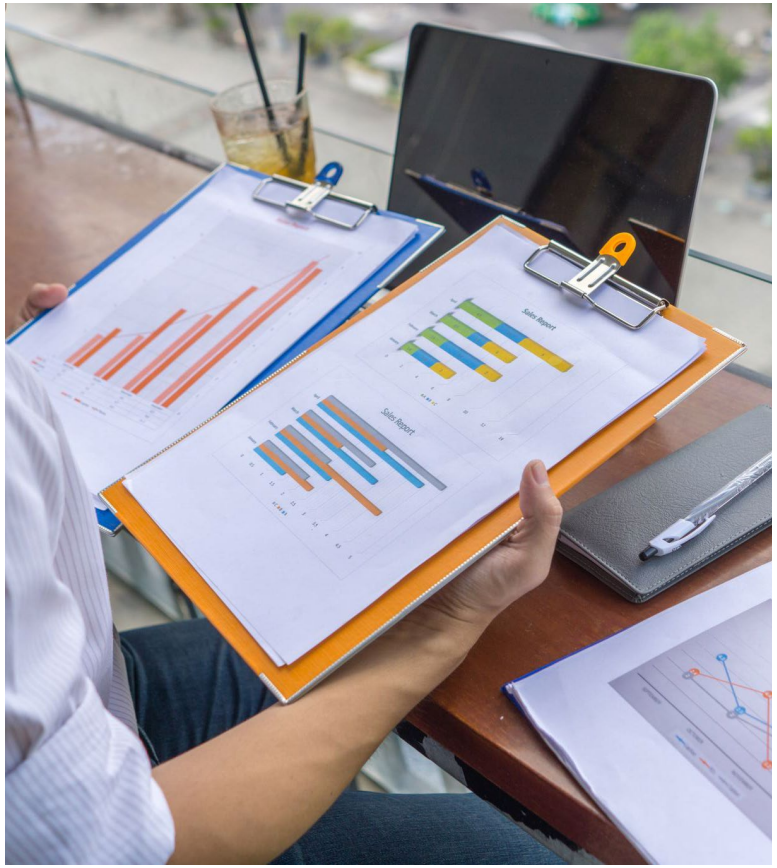

Organisations

- Ensure quality of the reports and include relevant data (Art. 7.1) and a safety risk classification (Art. 7.2).
- Conduct internal analysis of occurrences and contribute to risk mitigation (Art. 13).
- Protect personal data and avoid misuse of information for punitive purposes (Art. 15 & 16).
- Cooperate in follow-up actions and provide analysis reports to authorities if requested (Art. 13,4-5).

Responsibilities of org. & authorities

This project is funded by the European Union and implemented by EASA

Authorities: EU MMSS & EASA

- Establish mandatory & voluntary occurrence reporting systems (Art. 4 & 5).
- Designate a competent authority for collecting, evaluating, and analysing occurrence data (Art. 6.3).
- Ensure protection of the source and just culture in reporting systems (Art. 6.3-4, Art. 15 & 16).
- Transmit occurrences to the European Central Repository (ECR) through the ECCAIRS system (Art. 8).

Responsibilities of org. & authorities

This project is funded by the European Union and implemented by EASA

Authorities: EU MMSS & EASA

- Provide secure access to the ECR only to authorities (Art. 10).
- Ensure quality of collected data and encourage continuous improvement (Art. 7.3).
- Promote analysis and use of data to support safety actions and SSP implementation (Art. 13.10).
- Support the development and use of common taxonomy & ERCS (Art. 7).
- Implement appropriate penalties and enforcement for non-compliance (Art. 21).

Responsibilities of org. & authorities

This project is funded by the European Union and implemented by EASA

Authorities: EASA specific obligations

- Collect, analyse, and store reports received from organisations under its oversight.
- Coordinate at Union level the integration and use of occurrence data, including through the ECR (Art. 8, Art. 9).
- Provide guidance, tools, and workshops (Art. 7.8).
- Ensure protection of safety information and proper use of the ECR (Art. 11).

Responsibilities of org. & authorities

This project is funded by the European Union
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EUROPE: BASIC REGULATION (Reg. 2018/1139)

Article 5

European Aviation Safety Programme

Article 6

European Plan for Aviation Safety

Article 7

State Safety Programme

Article 8

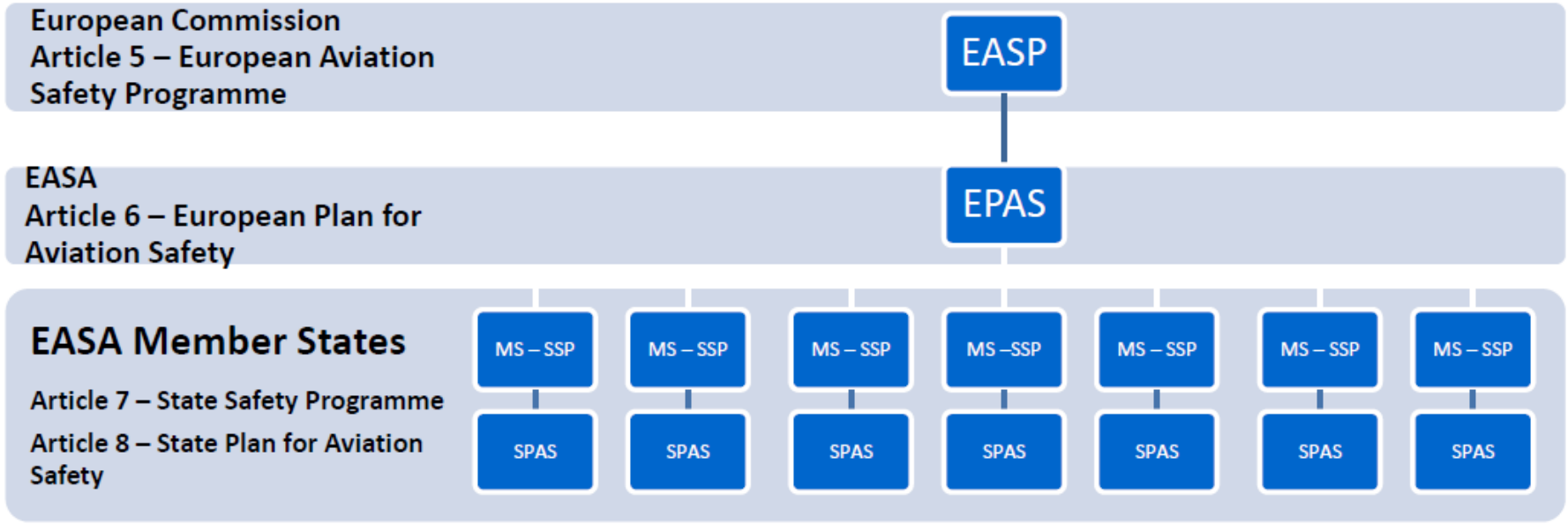
State Plan for Aviation Safety

Responsibilities of org. & authorities

This project is funded by the European Union and implemented by EASA

EUROPE: EPAS

as defined in Chapter II of the EASA Basic Regulation



Responsibilities of org. & authorities

This project is funded by the European Union
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EUROPA: EPAS

Global level

Regional level

State level

GASP

Global Aviation Safety Plan
ICAO

EPAS

European Plan for Aviation Safety
EASA

RASP

Regional Aviation Safety Plan
ICAO EUR-EASPG

SPAS

State Plan for Aviation Safety
State 1

SPAS

State Plan for Aviation Safety
State 2

SPAS

State Plan for Aviation Safety
State 3

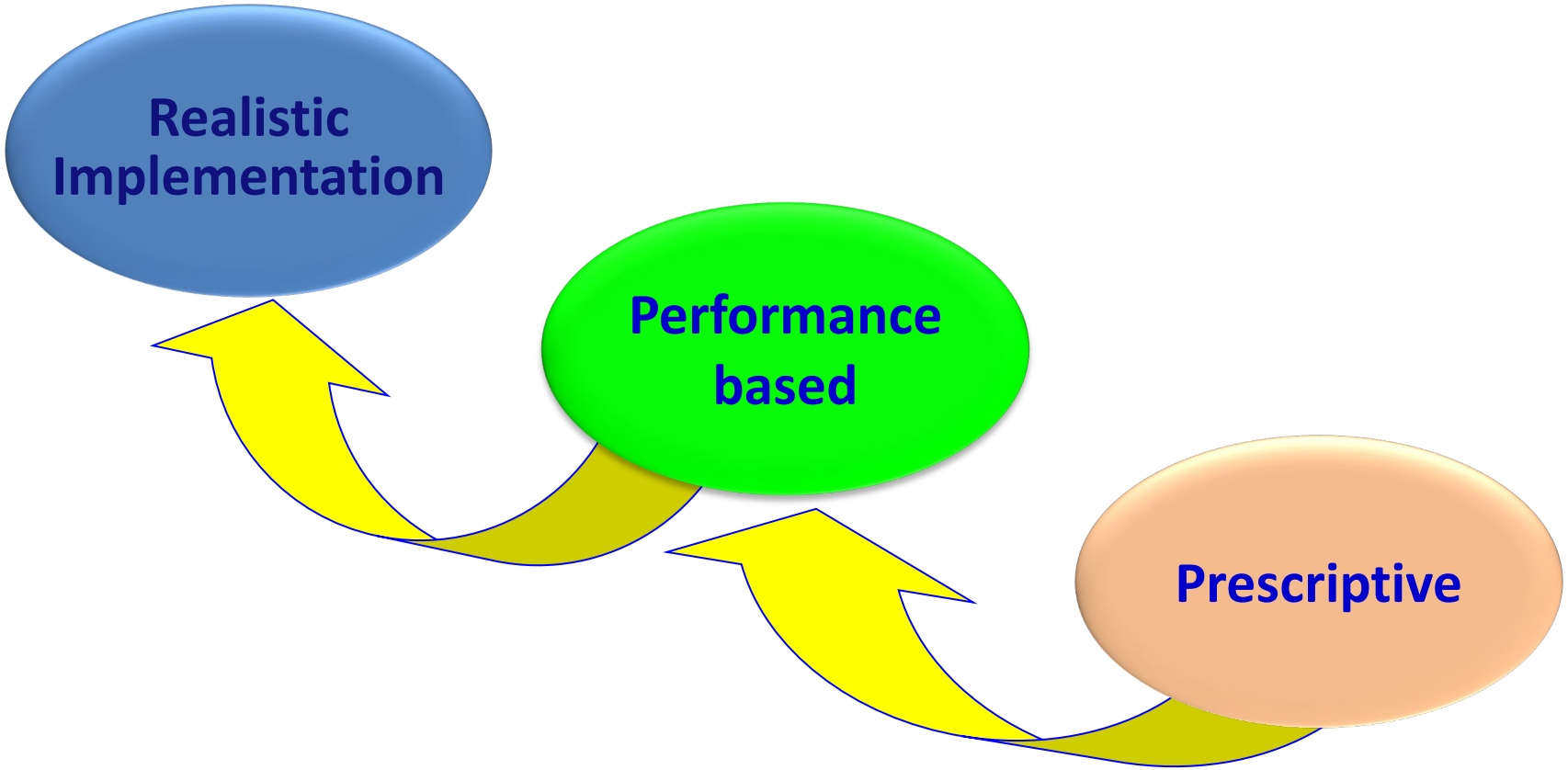
Module 3: Importance & Use of Data for Managing Safety

- From compliance-based to data-driven and performance-based oversight
- Linking data with proactive safety management

From compliance to perf.-based

This project is funded by the European Union and implemented by EASA

- **Some safety provisions on "hard rules" (Regulation, Law, Decree, MO) and some others on "soft rules" (CSs, AMCs, GM, IEM); *performance-based regulation* concept & *objective-based* regulations**



From compliance to perf.-based

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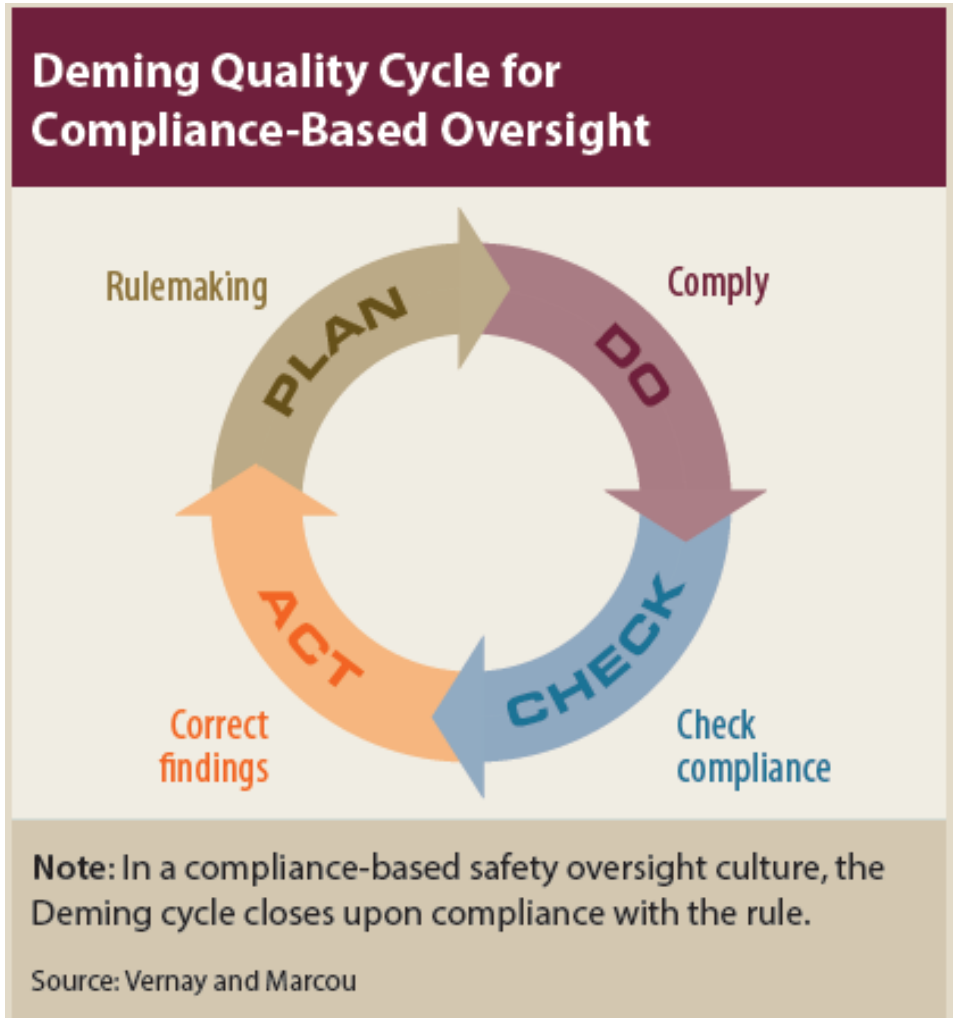

From compliance to perf.-based

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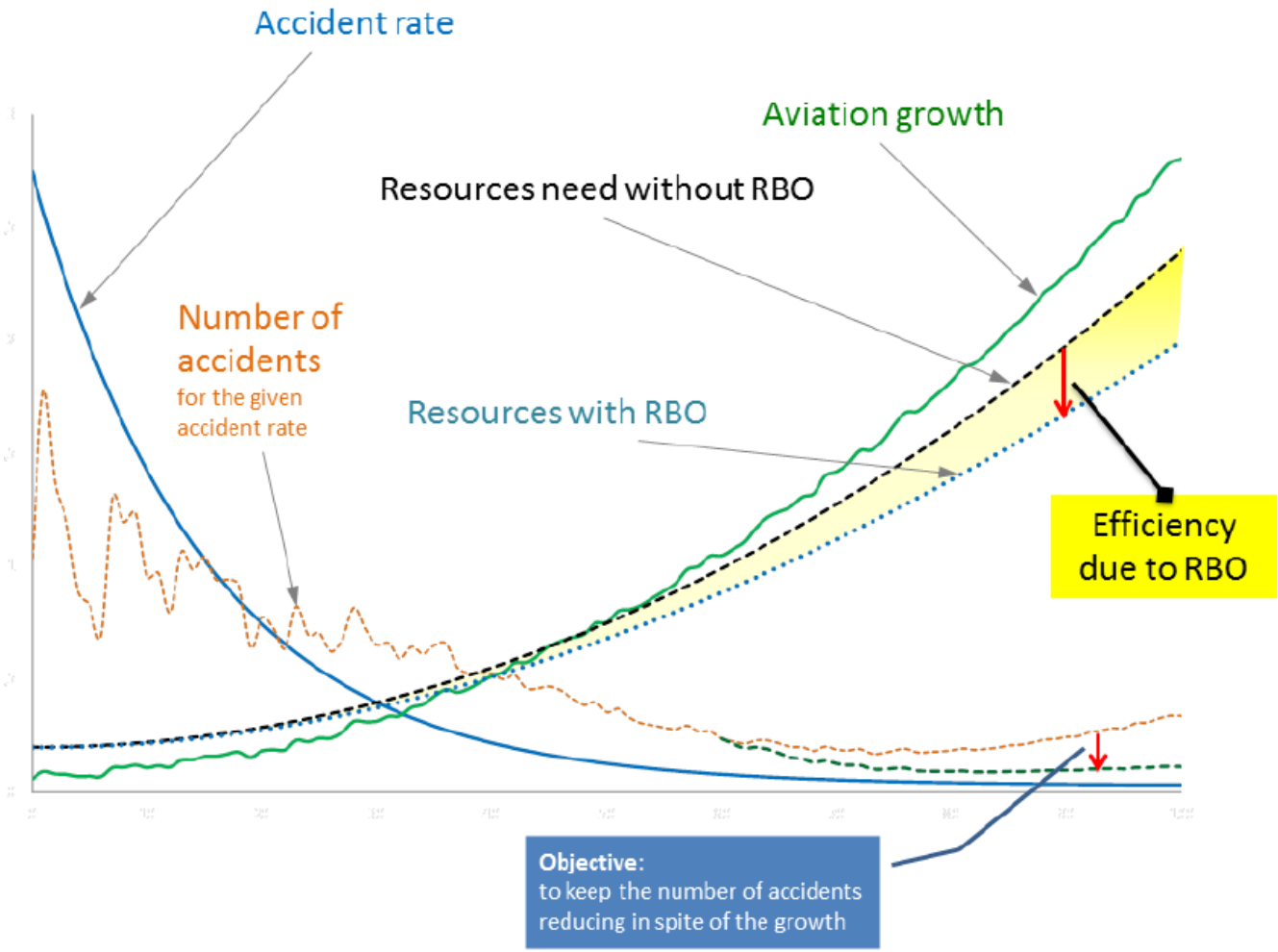

Safety risk-based surveillance concept EASA

From compliance to perf.-based

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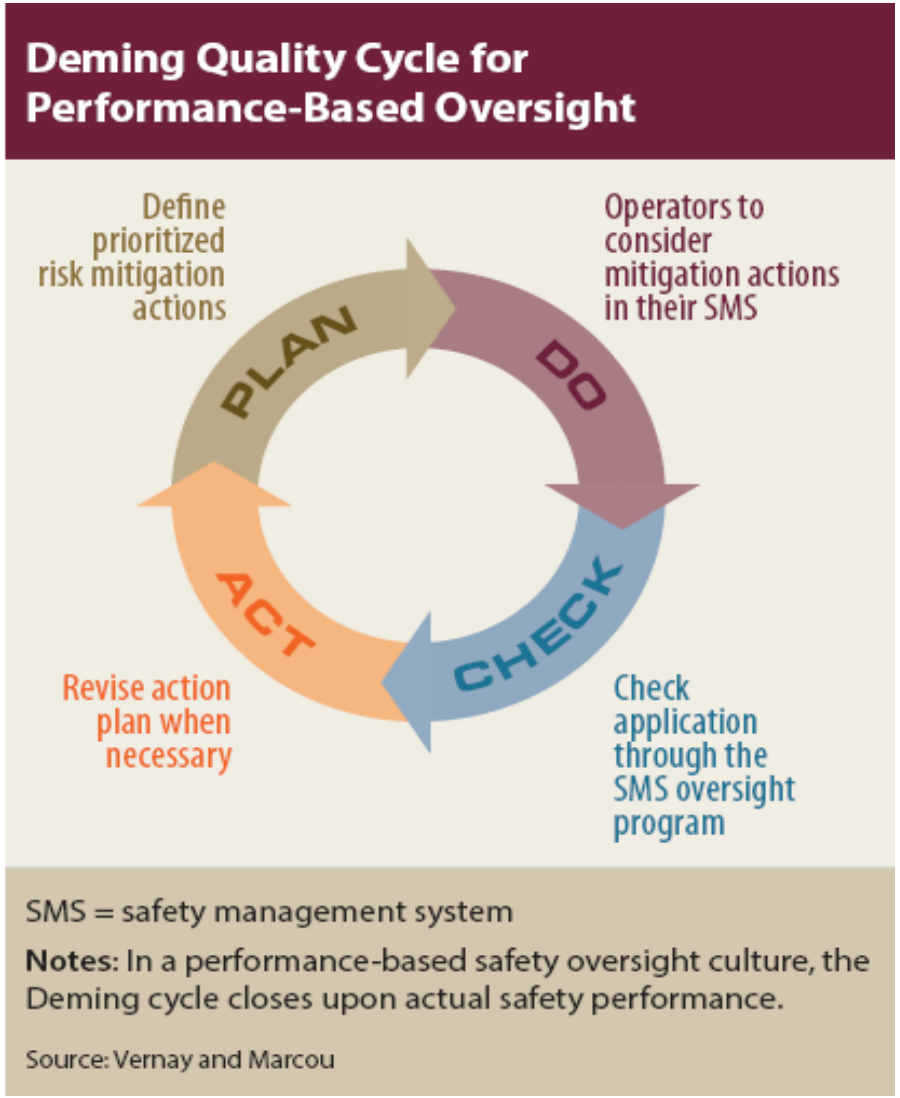

From compliance to perf.-based

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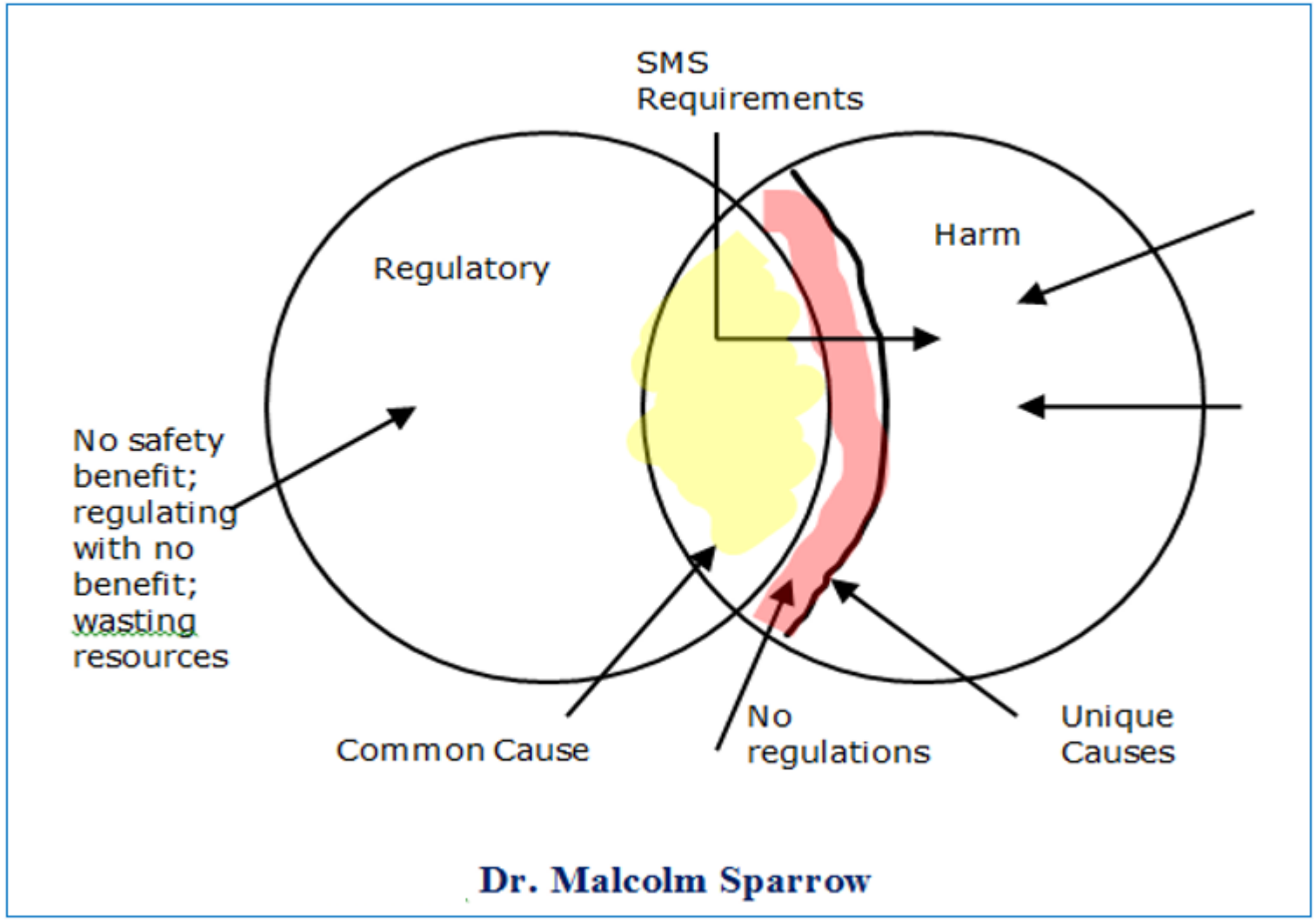

Linking data with proactive SRM

Why is it necessary to manage safety?

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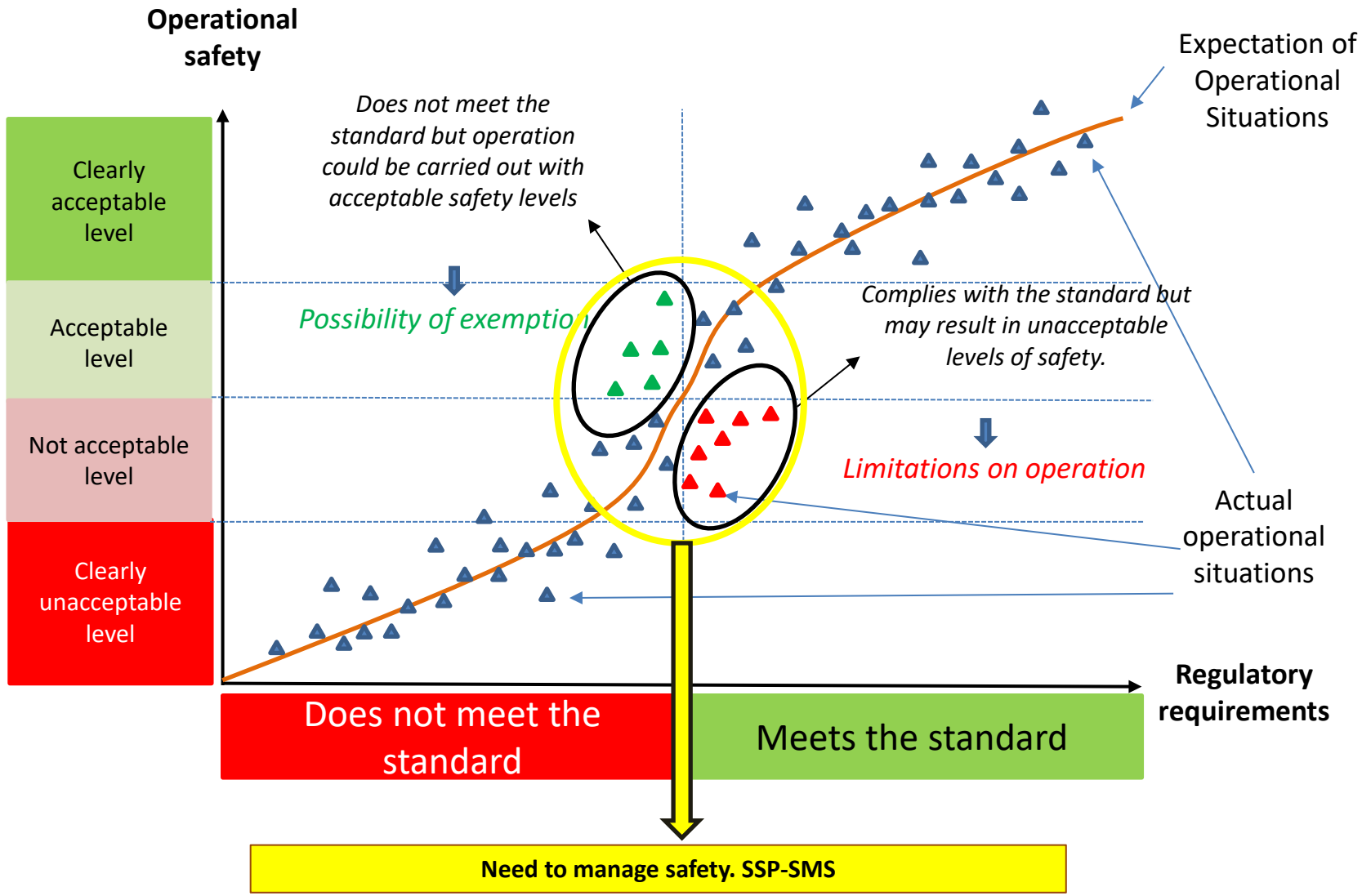

Linking data with proactive SRM

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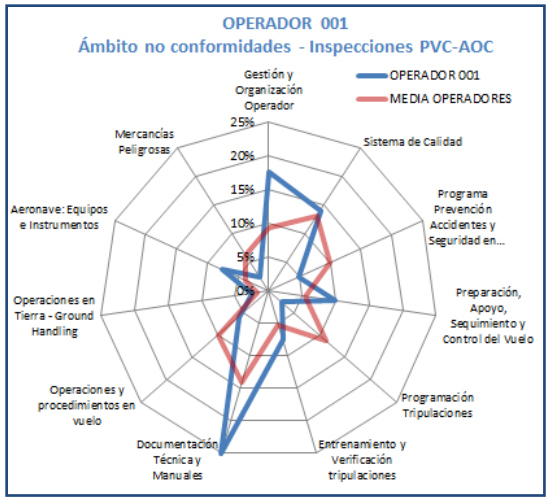
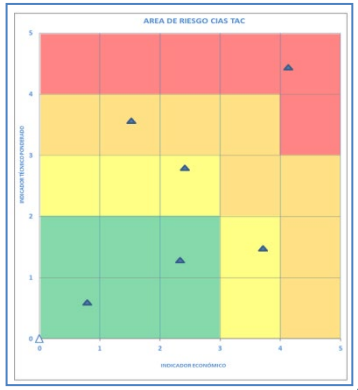
- Different levels of analysis:





Organisational level

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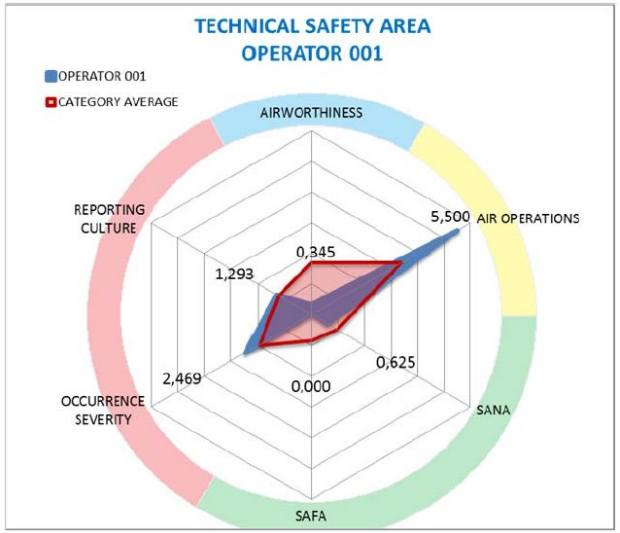
✈ Corporate level

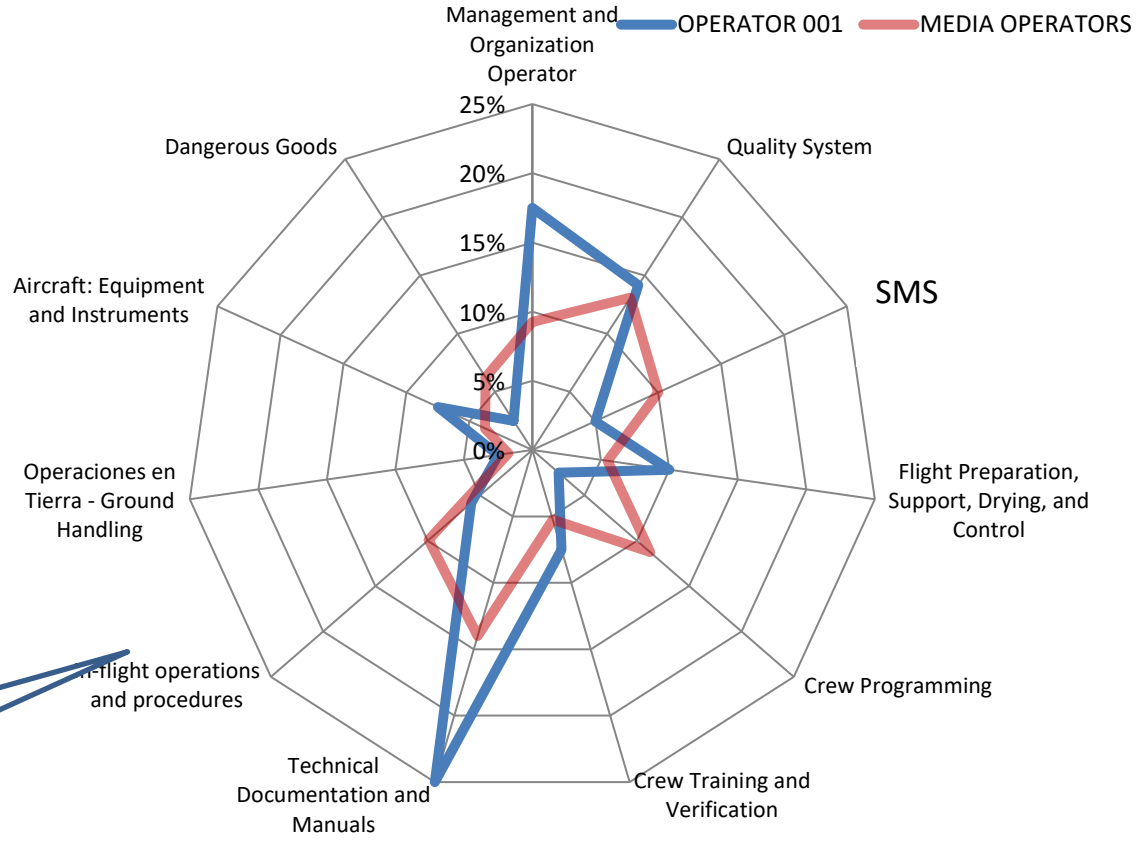
COMPARISON OF OPERATOR 001 INDICATORS AND AVERAGE FOR ALL OPERATORS



Safety ratios

Ops. Ratios

OPERATOR 001
AOC Inspections



Organisational level

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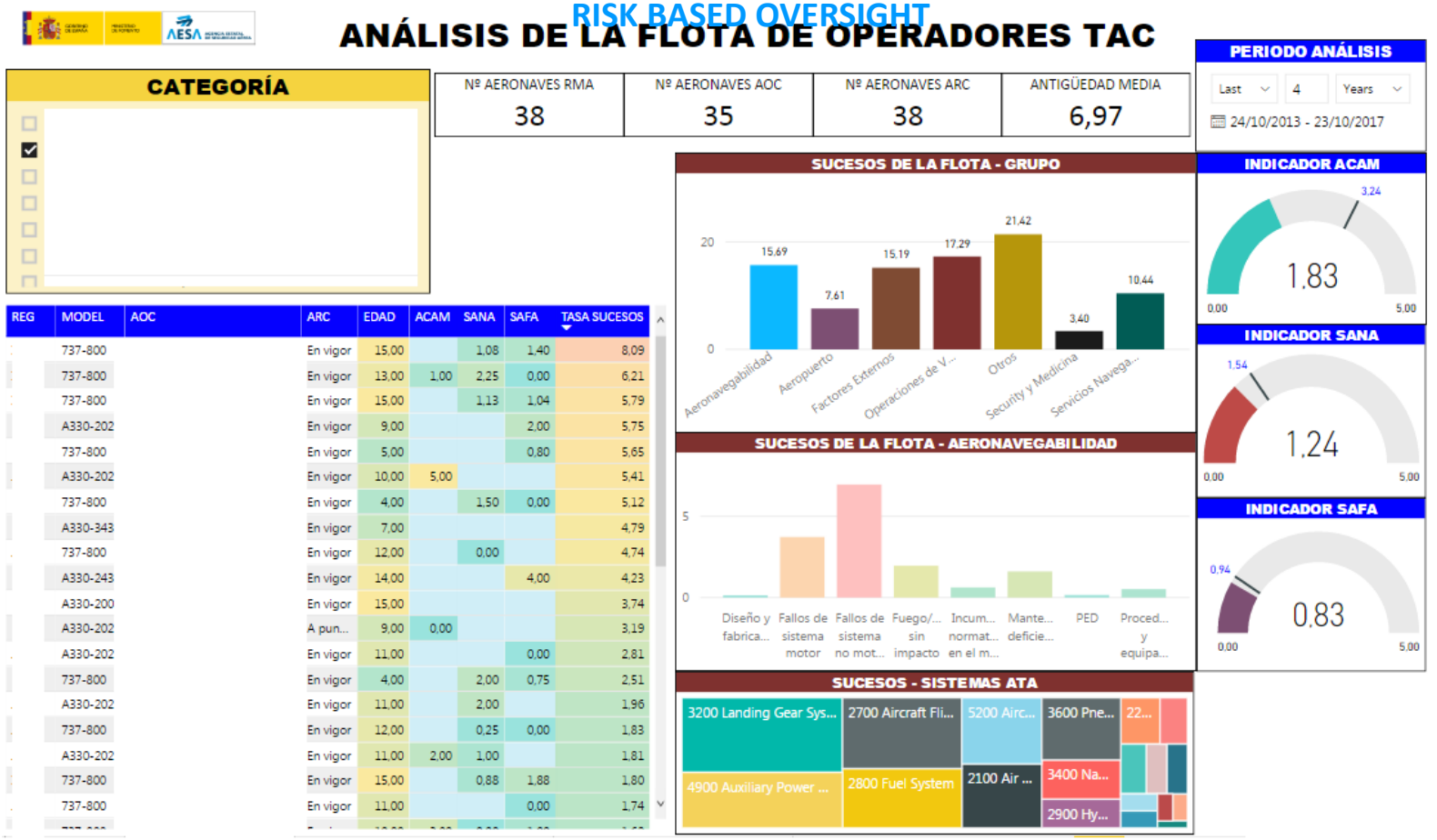
RISK BASED OVERSIGHT



REG	MODEL	AOC	ARC	EDAD	ACAM	SANA	SAFA	TASA SUCESOS
	737-800		En vigor	15,00		1,08	1,40	8,09
	737-800		En vigor	13,00	1,00	2,25	0,00	6,21
	737-800		En vigor	15,00		1,13	1,04	5,79
	A330-202		En vigor	9,00			2,00	5,75
	737-800		En vigor	5,00			0,80	5,65
	A330-202		En vigor	10,00	5,00			5,41
	737-800		En vigor	4,00		1,50	0,00	5,12
	A330-343		En vigor	7,00				4,79
	737-800		En vigor	12,00		0,00		4,74
	A330-243		En vigor	14,00			4,00	4,23
	A330-200		En vigor	15,00				3,74
	A330-202		A pun...	9,00	0,00			3,19
	A330-202		En vigor	11,00			0,00	2,81
	737-800		En vigor	4,00		2,00	0,75	2,51
	A330-202		En vigor	11,00		2,00		1,96
	737-800		En vigor	12,00		0,25	0,00	1,83
	A330-202		En vigor	11,00	2,00	1,00		1,81
	737-800		En vigor	15,00		0,88	1,88	1,80
	737-800		En vigor	11,00			0,00	1,74

Organisational level

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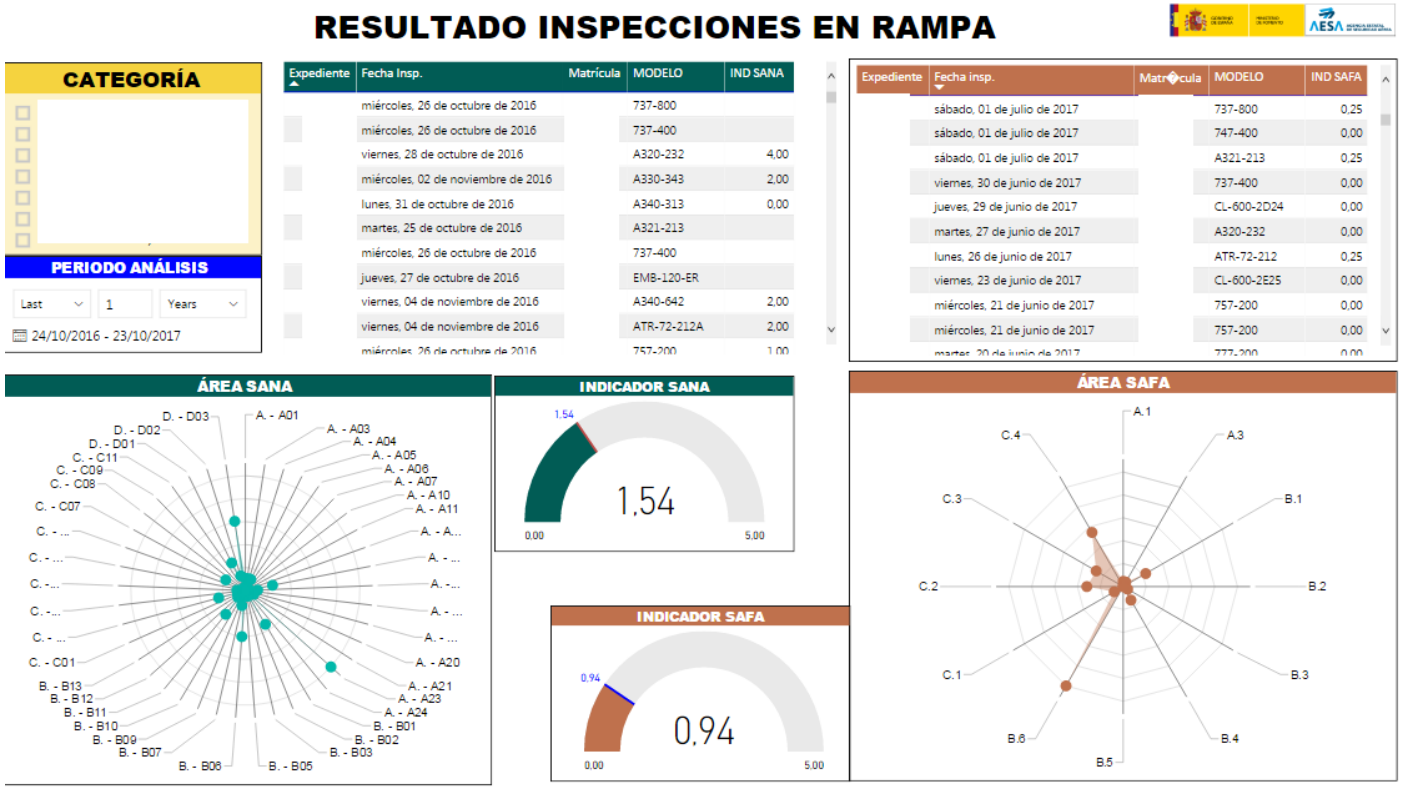
RISK BASED OVERSIGHT



Organisational level

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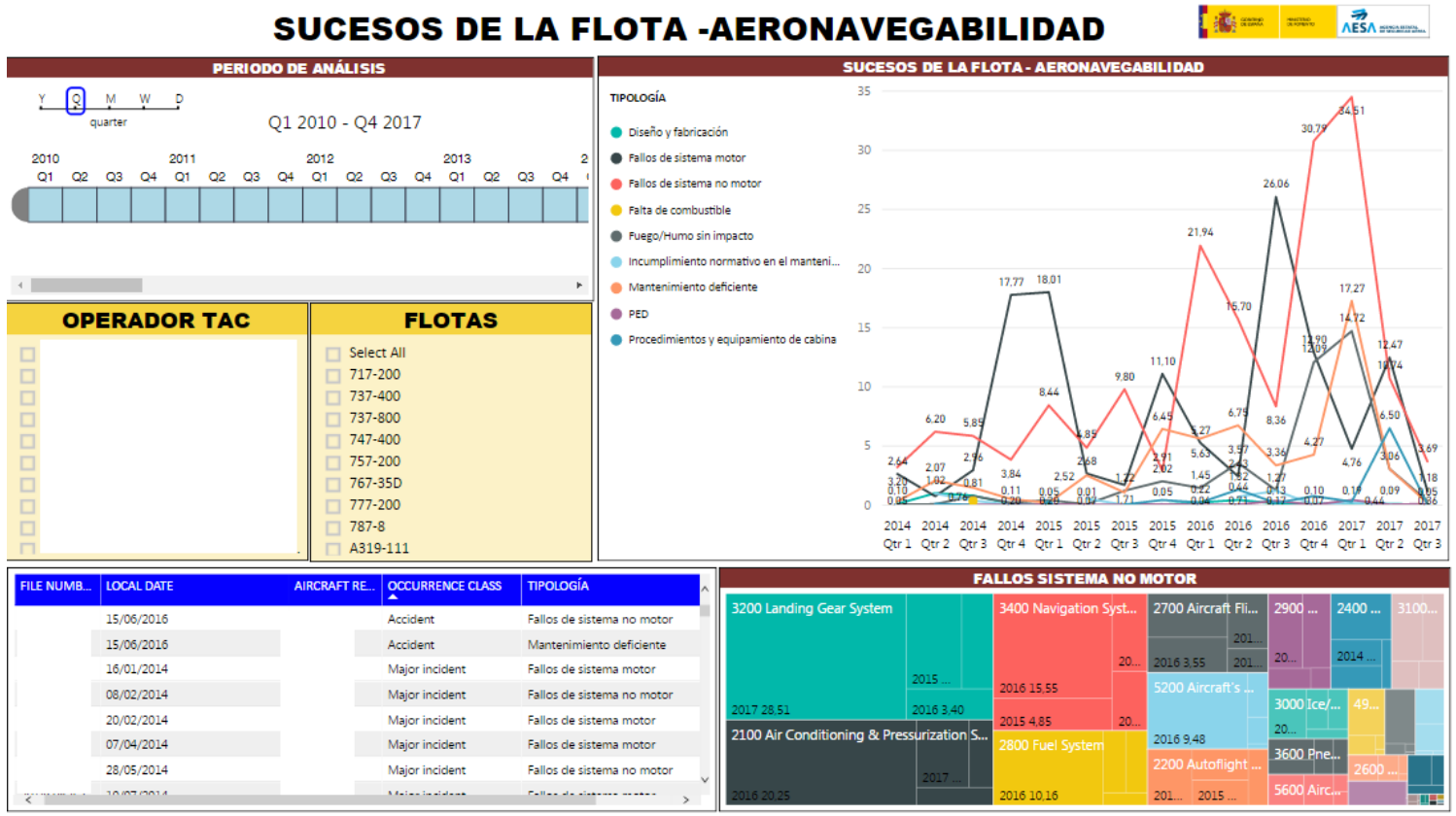
RISK BASED OVERSIGHT



Sectoral level

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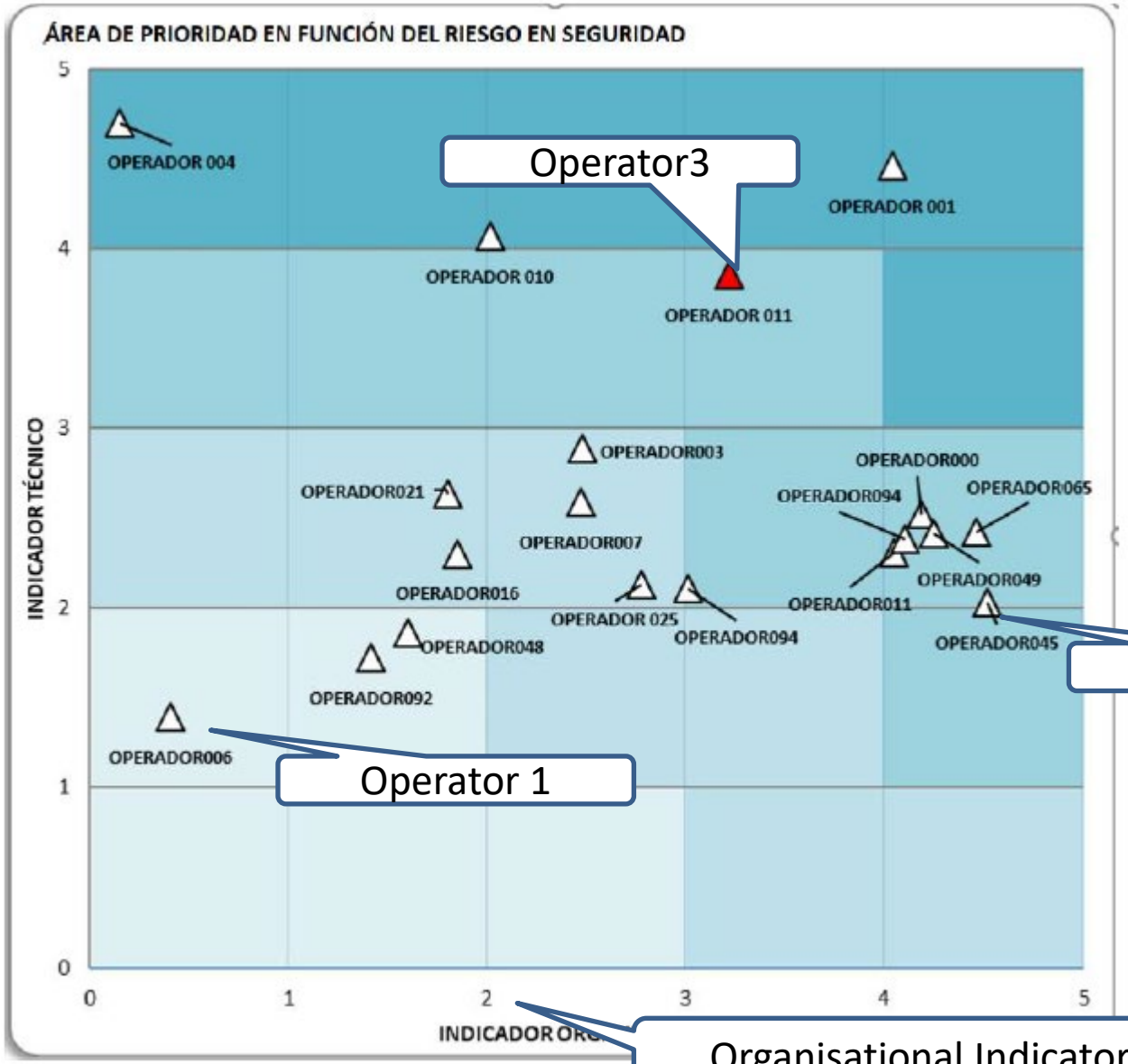

Operator3

Operator 2

Technical Indicator

Operator 1

Organisational Indicator

State level

EXPLORATORY DATA ANALYSIS

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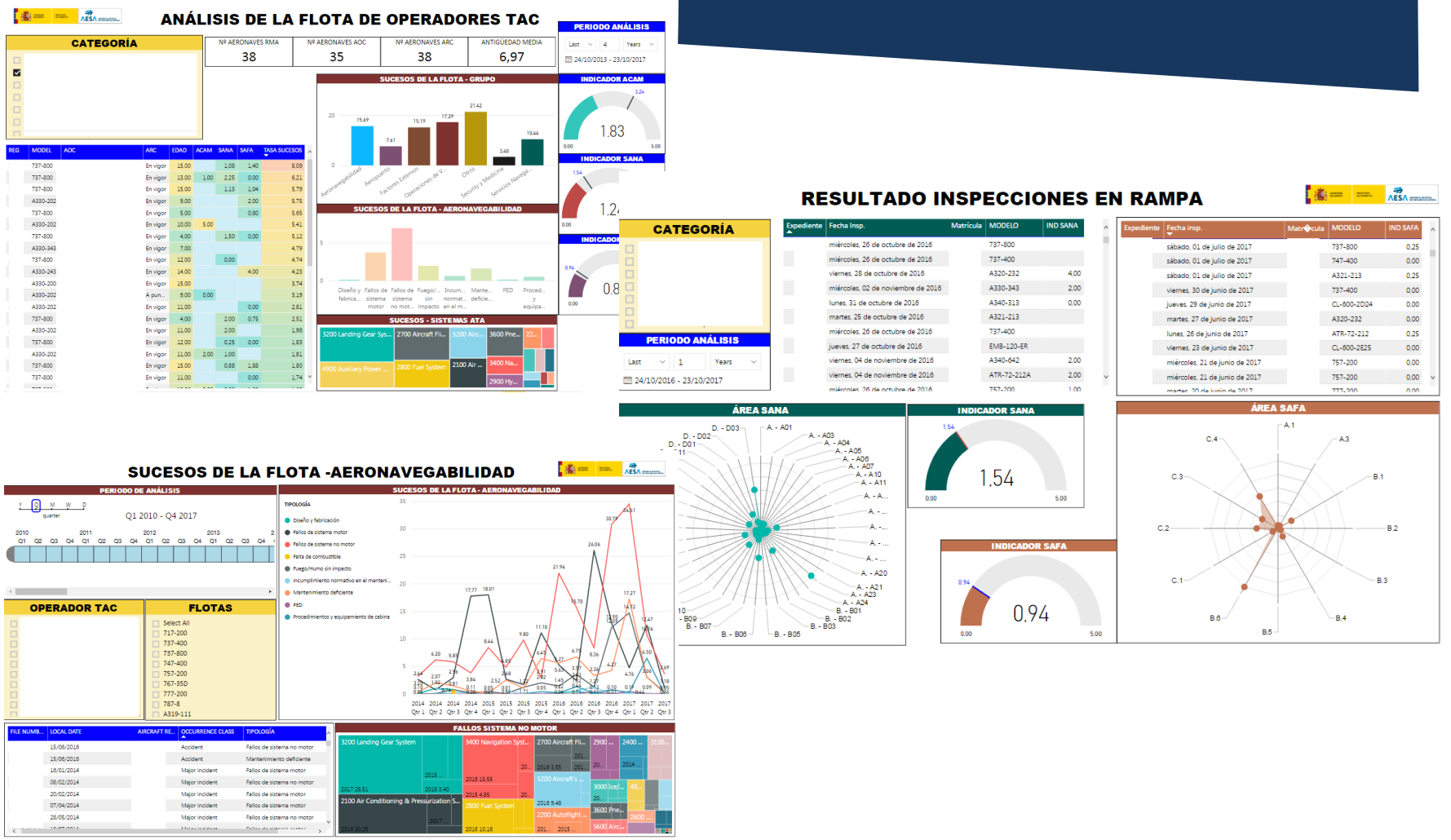

State level

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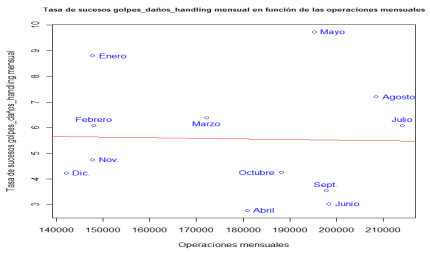


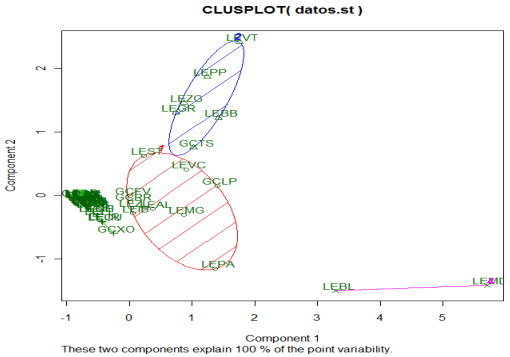

```
Residuals:
    Min      1Q  Median      3Q     Max
-2.8024 -1.5720 -0.2315  1.0310  4.2120

Coefficients:
             Estimate Std. Error t value Pr(>|t|)
(Intercept) 5.996e+00  4.857e+00   1.235    0.245
x           -2.400e-06  2.697e-05  -0.089    0.931

Residual standard error: 2.332 on 10 degrees of freedom
Multiple R-squared: 0.0007911,  Adjusted R-squared: -0.09913
F-statistic: 0.007917 on 1 and 10 DF,  p-value: 0.9309
```

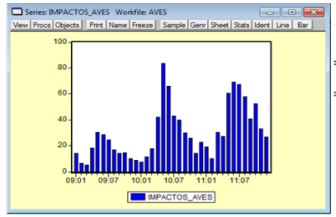
Stress effect

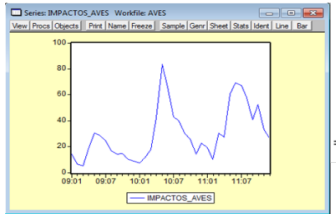
- Higher nº of operations induces a higher occurrence rate? Or Linear relation?



Geographical effect

- Geographical behavior?
- K-means clustering





Sample: 2009:01 2011:12
Included observations: 36

Autocorrelation	Partial Correlation		AC	PAC	Q-Stat	Prob
		1	0.765	0.765	22.877	0.000
		2	0.460	-0.302	31.397	0.000
		3	0.172	-0.147	32.624	0.000
		4	-0.059	-0.105	32.772	0.000
		5	-0.179	0.020	34.188	0.000
		6	-0.287	-0.220	37.948	0.000
		7	-0.240	0.242	40.663	0.000
		8	-0.218	-0.272	42.983	0.000
		9	-0.111	0.301	43.606	0.000
		10	0.082	0.105	43.957	0.000
		11	0.226	0.081	46.751	0.000
		12	0.373	0.102	54.689	0.000
		13	0.341	-0.144	61.607	0.000
		14	0.182	-0.287	63.665	0.000
		15	0.003	0.160	63.666	0.000
		16	-0.107	0.105	64.454	0.000

Seasonal effect

- Has the occurrence rate a monthly pattern?

Module 4: Safety Culture & Occurrence Reporting

→ Why is safety culture important?

→ Just Culture and trust in reporting

Three Distinct Cultures

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Three cultures

Three Distinct Cultures

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- **National culture** encompasses the value system of particular nations.
- **Organisational/corporate culture** differentiates the values and behaviours of particular organisations (e.g. government vs. private organisations).
- **Professional culture** differentiates the values and behaviours of particular professional groups (e.g. pilots, air traffic controllers, maintenance engineers, aerodrome staff, etc.).

➢ **No human endeavour is culture-free**

Three Distinct Cultures

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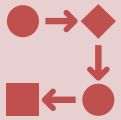
Organisational/ Corporate Culture

Sets the boundaries for **acceptable behaviour in the workplace** by establishing norms and limits.



Provides a framework for managerial and employee decision-making

"This is how we do things here, and how we talk about the way we do things here".

Organisational/corporate culture shapes – among many others – **safety reporting procedures and practices** by operational personnel.

Safety Culture

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Safety culture is not **an end in itself**, but **a mean** to achieve an essential safety management prerequisite:

- Effective safety reporting

Safety Culture

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Uttal's Definition (1983):

- Safety culture is composed of shared values (importance) and beliefs (how things work) within an organisation.
- These elements interact with organisational structures and control systems to establish behavioural norms, or "the way we do things here."

Two Perspectives:

- Safety Culture as "What an Organisation Is": Reflects beliefs, attitudes, and values of its members about safety.
- Safety Culture as "What an Organisation Has": Refers to structures, practices, and policies designed to improve safety.

Safety Culture

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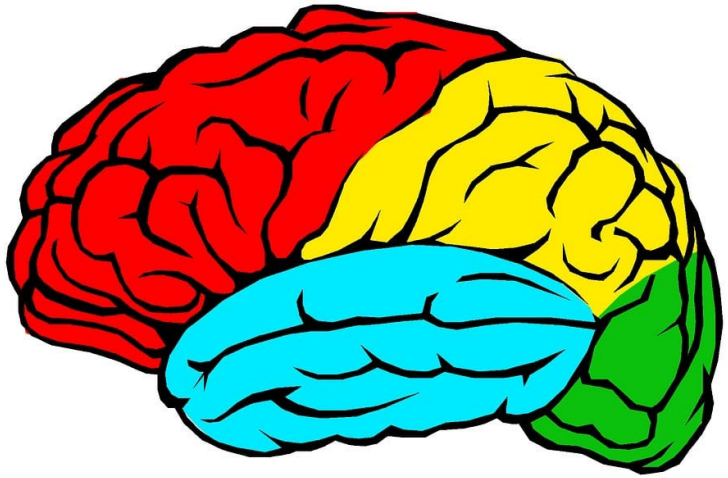
Influencing Safety Culture

Easier to Shape Organisational Structure than Attitudes:

- It's challenging to change adult beliefs and attitudes directly (Hofstede, 1994).
- However, organisational controls and practices can influence behaviour, which in turn can lead to shifts in beliefs over time.



Action-Driven Change: Organisational policies and actions shape thinking, making it possible to nurture a safety mindset through consistent practices and enforcement.

Safety Culture

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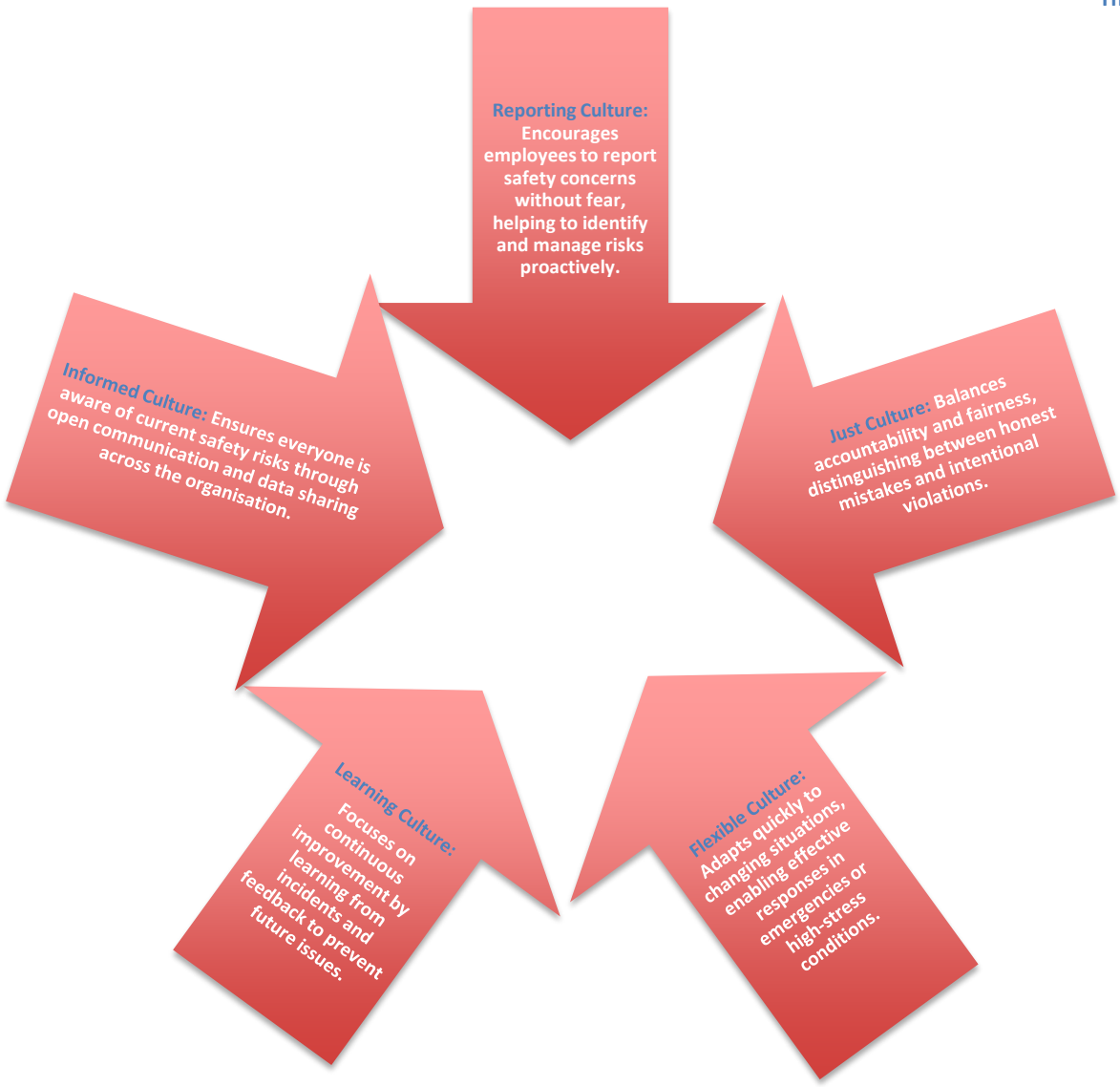
J. Reason's five elements of safety culture



Safety Culture

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Three options

- **Organisations and the management of information**
  - **Pathological** – Hide the information
  - **Bureaucratic** – Restrain the information
  - **Generative** – Value the information

Source: Ron Westrum

Safety Culture

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3 possible organisational cultures

Source: Ron Westrum

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

Why is Safety Culture Important?

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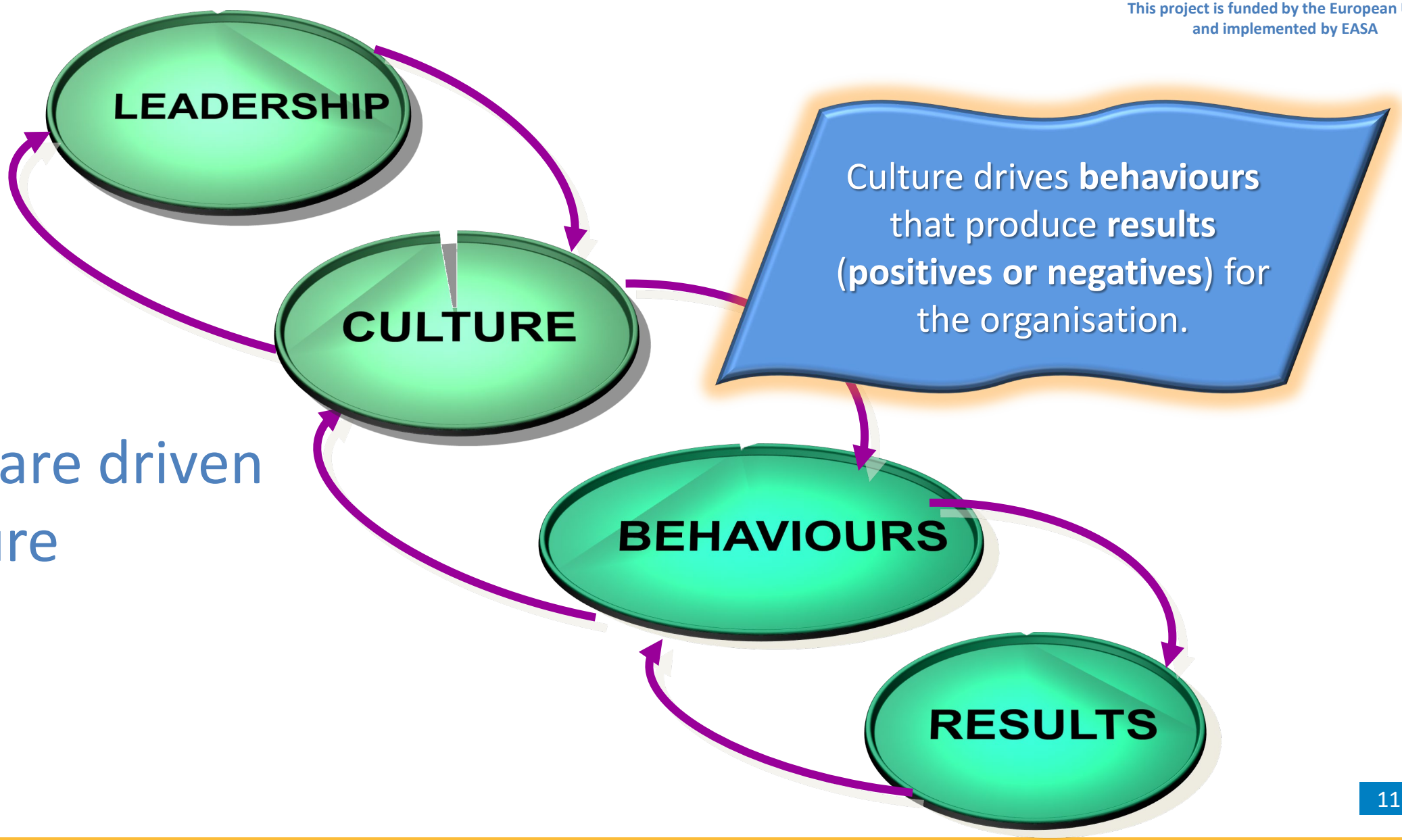

Results are driven by culture

Why is Safety Culture Important?

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The Role of Safety Culture as a “System Engine”

- **Goal of Safety Culture:**
  - ✓ To build a resilient system that maximises resistance to operational hazards, regardless of leadership or commercial pressures.
- **"Don’t Forget to Be Afraid":** Maintaining a culture of caution is challenging, especially in industries with few accidents.
- **Dynamic Non-Events:**
  - ✓ Weick (1991) describes safety as a “dynamic non-event,” where the absence of accidents can lead to complacency. Safety must remain visible and actively maintained, even when nothing seems to be happening.

Why is Safety Culture Important?

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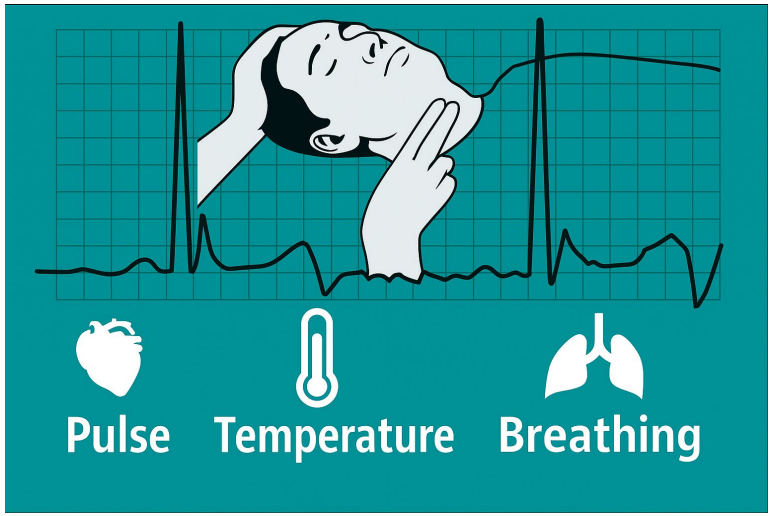
Building an Informed Culture

- **Importance of Data Collection and Safety Assurance:**
  - ✓ Safety requires **continuous monitoring** of incidents, near misses, and system "vital signs."

- **Safety Information Systems:**
  - ✓ It is essential to collect, analyse, **and share** data from near misses and regular safety checks.
  - ✓ This proactive approach contributes to an "**informed culture**" where everyone in the organisation stays aware of factors impacting safety.



Why is Safety Culture Important?

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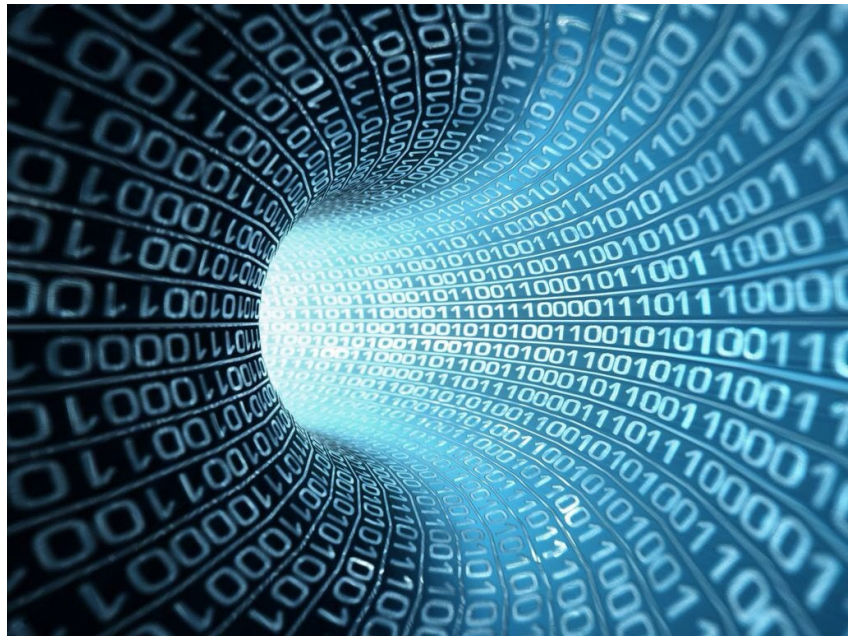
Informed Culture as the Foundation of Safety Culture

- **Informed Culture = 1 element of Safety Culture**:
  - ✓ An informed culture involves consistent knowledge of human, technical, organisational, and environmental factors affecting safety.

- **Sustaining Safety Culture:**
  - ✓ Achieving an ideal safety culture requires a **continuous flow of safety data and respect for potential hazards**, creating a **proactive and resilient organisational environment**.



Why is Safety Culture Important?

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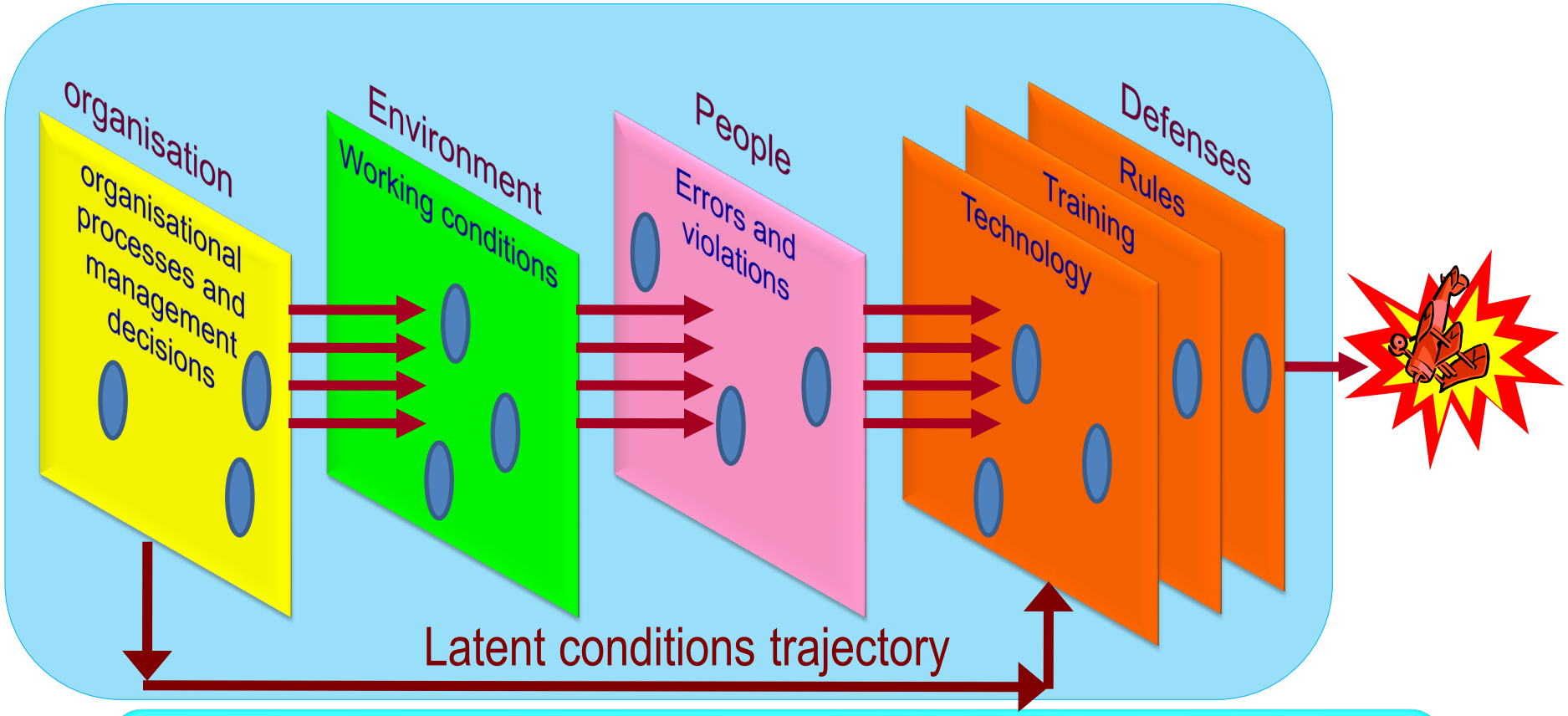

Epidemiologic Model (J. Reason): Latent conditions present in the system before the accident. Organisational Accidents.

Why is Safety Culture Important?

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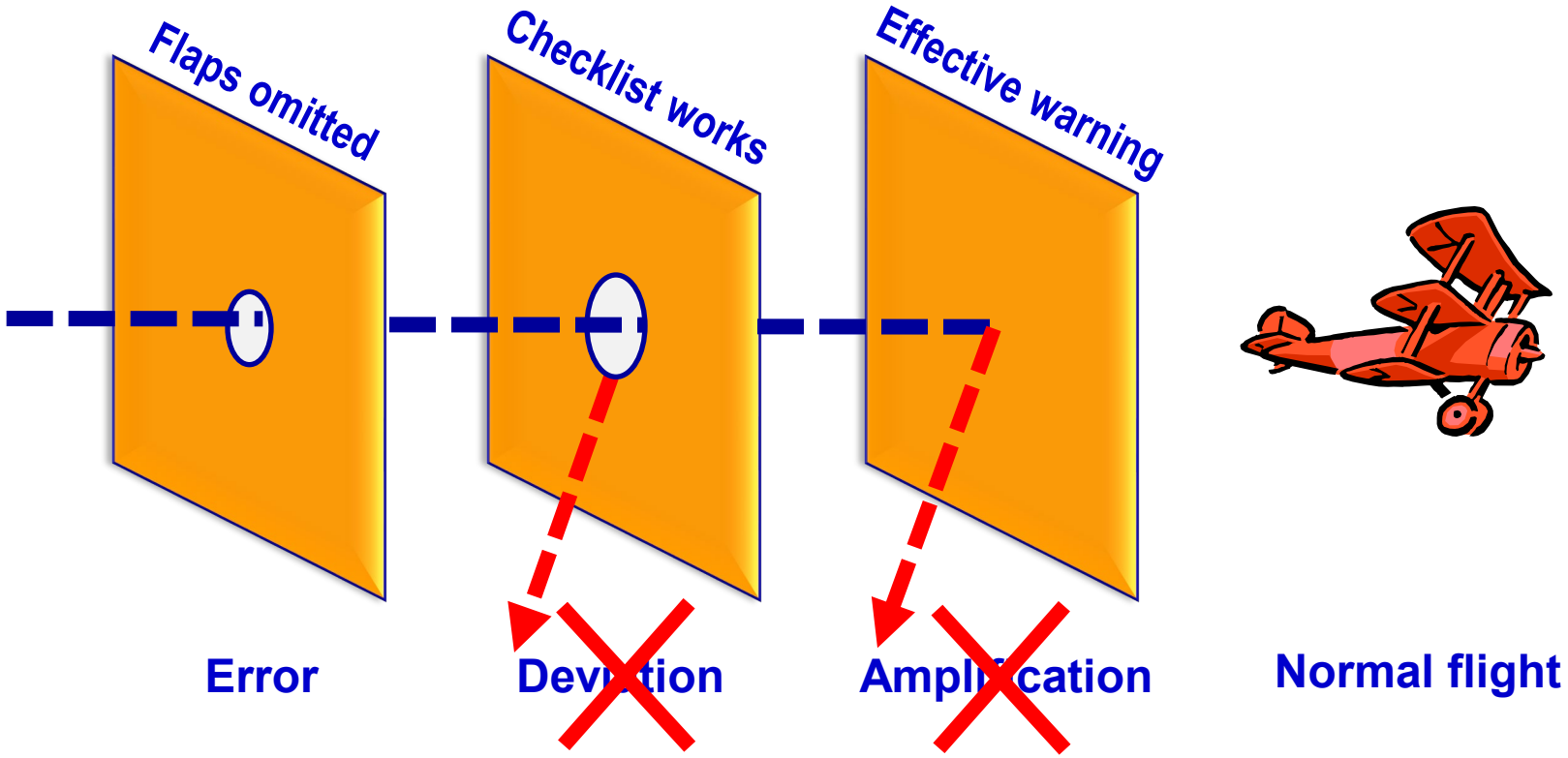
Safety management – On almost every flight



Why is Safety Culture Important?

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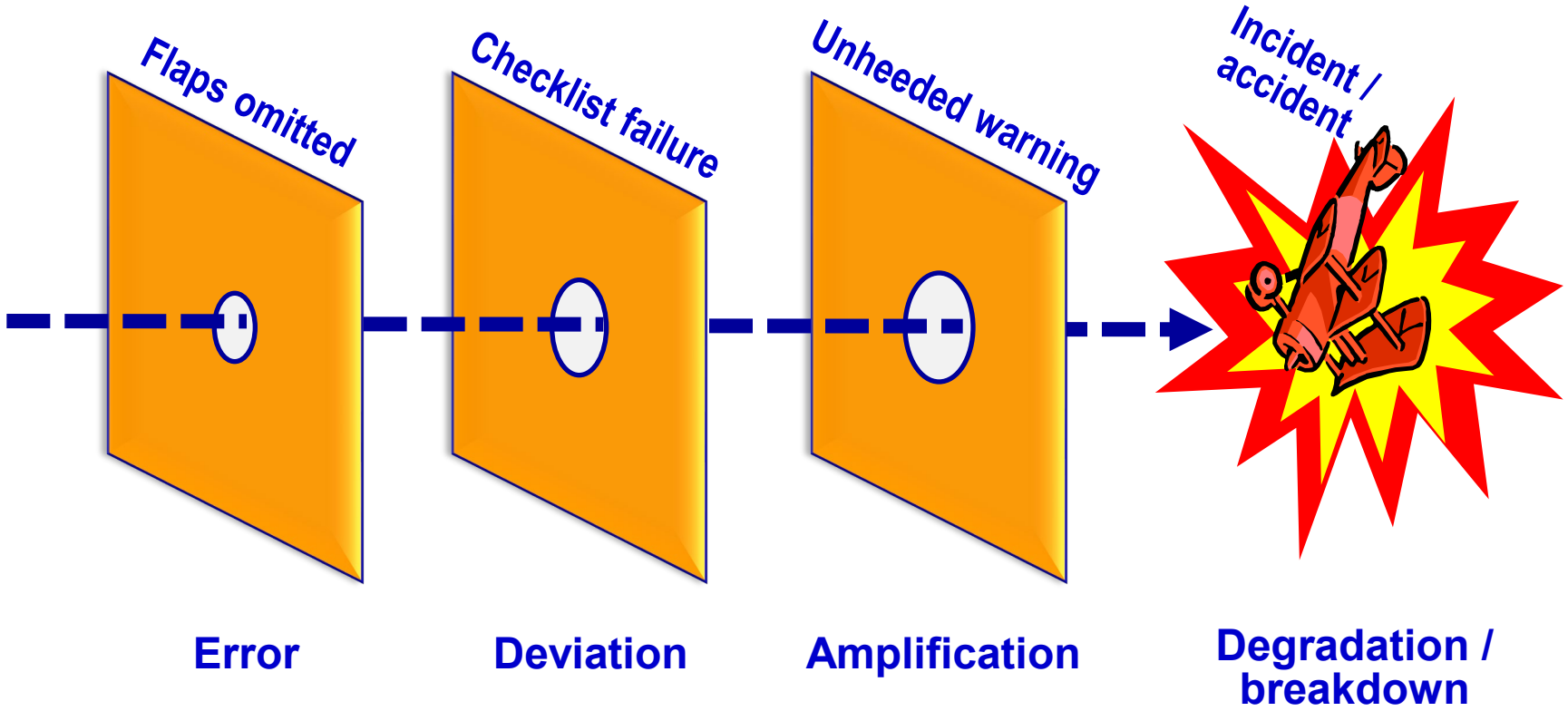
Accident investigation – Once in a 10 million flights



Accident Causation Models

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The organisational accident

Activities over which any organisation has a reasonable degree of direct control

Accident Causation Models

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Conditions present in the system before the accident, made evident by triggering factors.

Accident Causation Models

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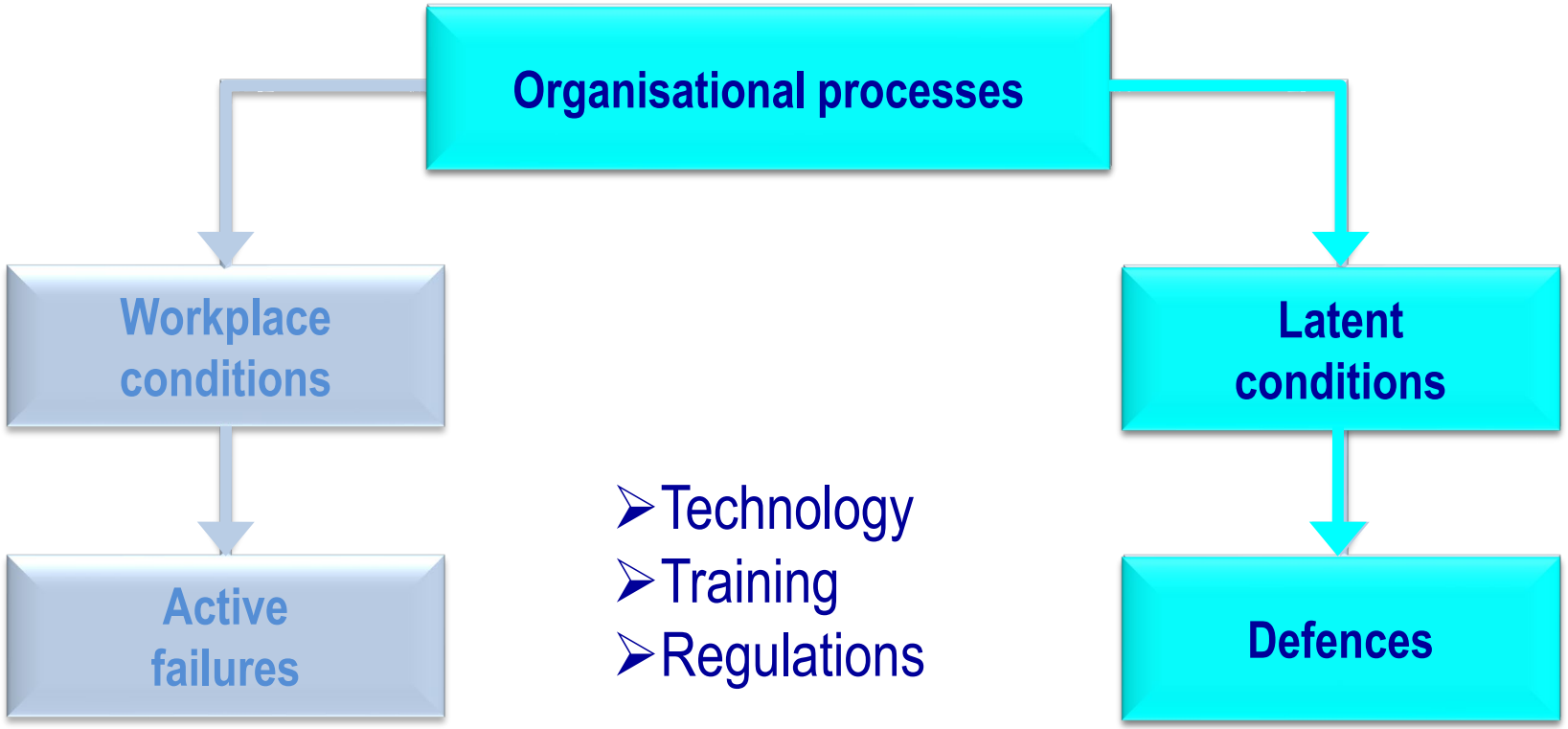

Resources to protect against the risks that organisations involved in production activities generate and must control.

Accident Causation Models

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Factors that directly influence the efficiency of people in aviation workplaces.

Accident Causation Models

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Actions or inactions by people (pilots, controllers, maintenance engineers, aerodrome staff, etc.) that have an immediate adverse effect.

Accident Causation Models

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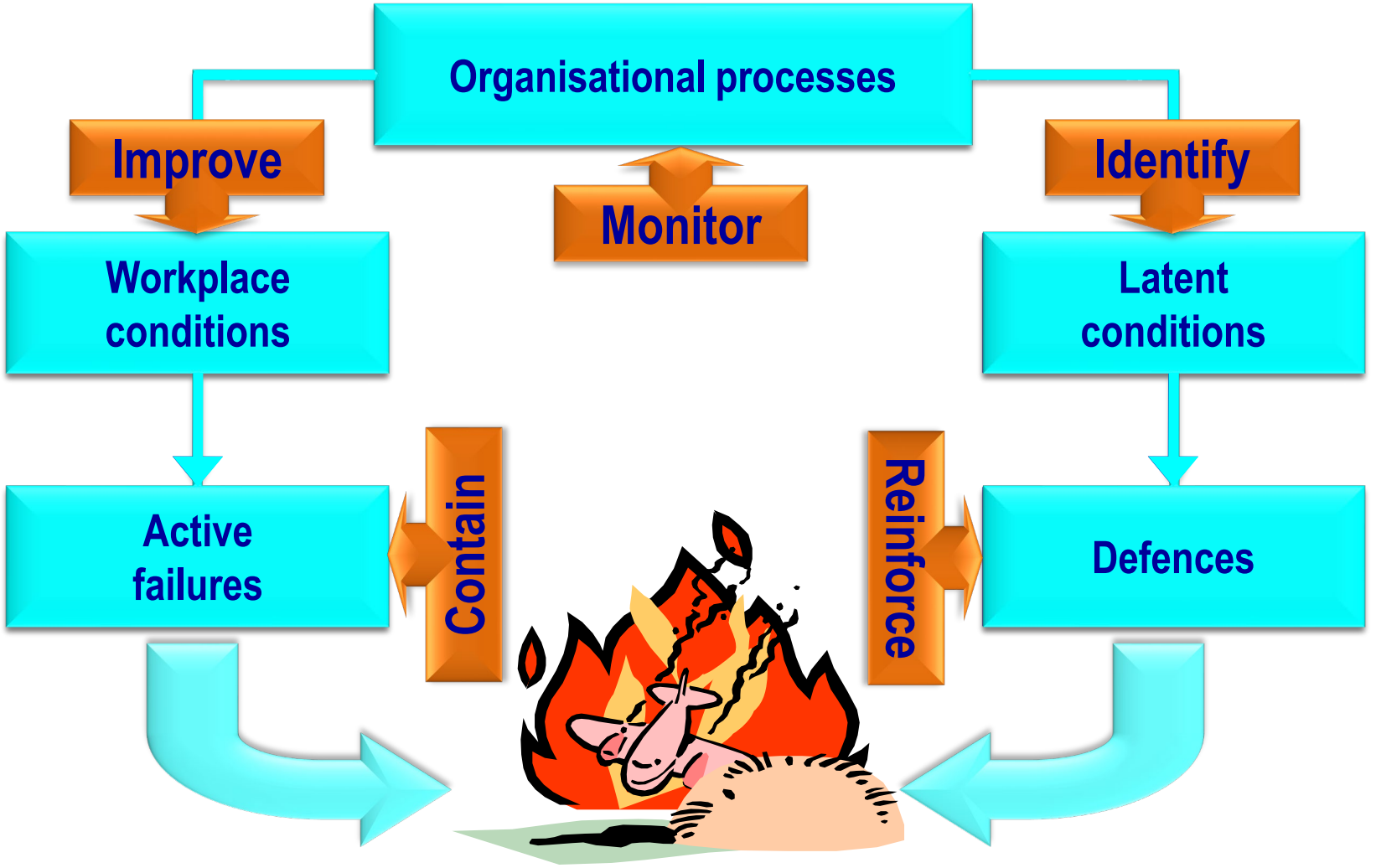

Why is Safety Culture Important?

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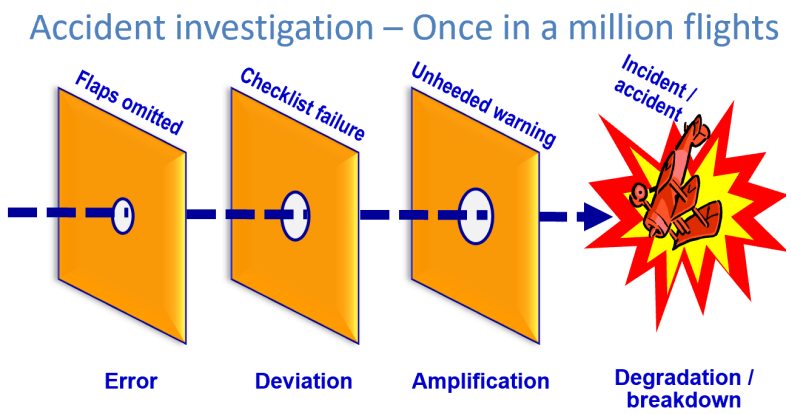
The "Swiss Cheese" Model of Defence Layers

- **Concept of the Swiss Cheese Model**:
  - ✓ Each defence layer is like a slice of cheese with “holes” (weaknesses) that may align, allowing an accident to occur.
- **Types of Gaps:**
  - ✓ **Active Failures:** Immediate errors made by individuals.
  - ✓ **Latent Conditions:** Long-term, unnoticed weaknesses created by design, management, or maintenance oversights.
- **Importance of Dynamic Gaps:** Unlike fixed holes in cheese, these gaps shift and change, making systems vulnerable to a rare but dangerous alignment that can result in an accident.



Why is Safety Culture Important?

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The Influence of Safety Culture Across All Defensive Layers

- **Widespread Effect of Culture**:
  - ✓ Safety culture can impact all defence layers, as it permeates the entire organisation.
- **Risks of an Inadequate Safety Culture**:
  - ✓ **Increased Front-line Errors:** Poor training, inadequate communication, and a lack of focus on safety lead to more errors.
  - ✓ **Creation of Latent Weaknesses:** Failure to recognise hazards due to insufficient safety focus can lead to long-term weaknesses.
  - ✓ **Failure to Address Known Deficiencies:** Neglect or avoidance of addressing gaps increases the risk of severe incidents, as seen in historical examples (e.g., Challenger).

Why is Safety Culture Important?

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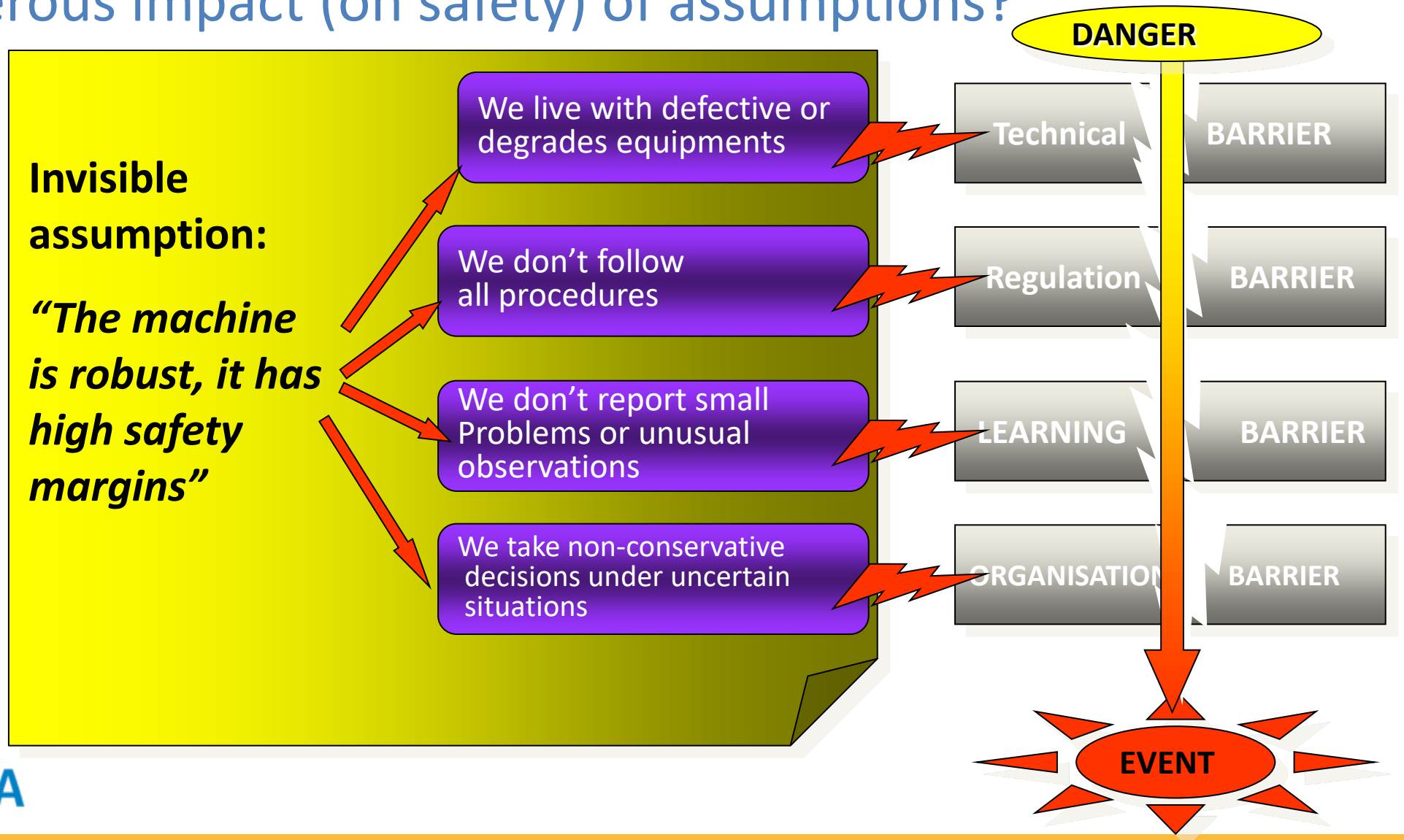
Dangerous impact (on safety) of assumptions?



Why is Safety Culture Important?

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The general definition holds true because organisational culture is the underlying fundamental culture:

> *The basic assumptions, shared values and beliefs, that guide the way* ***employees behave toward each other*** *and* ***approach their work****.*

Organisational Culture is important for safety because:

Certain types of organisational cultures are more beneficial for safety. Organisational Culture is not neutral to safety

Why is Safety Culture Important?

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Safety Culture is the part of the Organisational Culture that directly influences behaviours relevant for the safety of the installation or activity. Precisely because Safety Culture is underpinned by Organisational Culture it is important to understand and improve the Organisational Culture.

Safety Culture is important for safety because:

Safety Culture drives **behaviours** that produce **results** in terms of **safe performance** of the activities and of the installations.

Why is Safety Culture Important?

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Summary:

- Almost 90% of people in organisations recognise that culture is critical for success.
- If we look at accidents in different industries, we see that poor safety culture has been a fundamental cause.
- If we compare good and poor cultures, we see a significant impact on performance (safety and economic).
- That explains why industries, international organisations and regulators (in many fields) are increasing their requirements and supervision for safety culture.

We need to manage Safety Culture!

Just Culture and trust in reporting

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Why people are reluctant to report?

- **Retaliation**
- **Self-incrimination**
- **Embarrassment**
- **Liability**

Just Culture

- Individuals are not punished for actions, omissions or decisions taken by them that are commensurate with their experience and training but which result in a reportable event; but
- Where gross negligence, willful violations and destructive acts are not tolerated

Just Culture and trust in reporting

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Just Culture

"*a culture in which front-line operators or other persons are not punished for actions, omissions or decisions taken by them that are commensurate with their experience and training, but in which gross negligence, wilful violations and destructive acts are not tolerated*"

Just Culture and trust in reporting

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Just Culture

- A safety culture encompasses a just culture
- SSP/SMS is also about the people not just the system
- Just culture:
  - encourages reporting of hazards and errors
  - allows honest and open responses in event investigations
  - ensures fairness and defines the 'line in the sand' between errors, violations and recklessness
  - helps establish why things happen
- As the 'Regulator' we need to be sensitive to an organisation's just culture

Just Culture and trust in reporting

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Just Culture

- A good safety culture encourages reporting of hazards
- Hazard identification is the core of SSP/SMS processes
- People will share their experiences and near misses
- A "Just Culture" ensures fairness and defines the "line" between errors, violations and recklessness
- The reporting policy and its relevant disciplinary policy should be clearly laid out and visible
- Culpability decision trees could be used

Just Culture and trust in reporting

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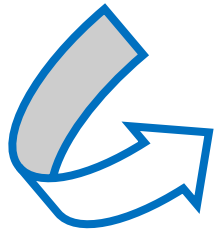
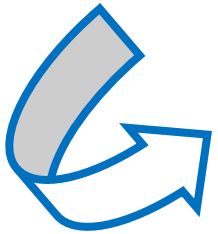
Actions, omissions and decisions that are expected from someone with their level of training and experience

Just Culture



Not prosecuted

Gross negligence or wilful misconduct



Not tolerated

But who draws the line?

Just Culture and trust in reporting

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Protecting sources of safety information

- Assembly Resolutions A35/17, A36/9, A37/1&3
- Legal guidance in Annex 19, Appendix 3

Safety information must not be used for purposes other than the purposes for which it was collected.

  - *General principles*
  - *Principles of protection*
  - *Principles of exceptions*
  - *Public disclosure*
  - *Responsibilities of the custodian of safety information*
  - *Protection of recorded data*

EASA
European Union Aviation Safety Agency

This project is funded by the European Union
and implemented by EASA

Effective Aviation Safety Occurrence Reporting Systems: Implementation and Use in SSP/SMS

EU-Africa Safety in Aviation (EU-ASA) Project

Dates: 15–18 July
Online: Zoom

easa.europa.eu/connect

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