State Safety Programme and SMS Surveillance

CAAi, a wholly owned subsidiary of the UK CAA

Overview

- SSP overview
- UK SSP development
- SMS surveillance activities

Key Safety Management Questions

Have the right risks been identified?

Are the right actions being measured?

And does it all add up?

Have the right outcomes been agreed?

Have the right actions been initiated?

ICAO Safety Management Requirements

ICAO Requirements

Annex 19

States to develop a State Safety Programme (SSP)
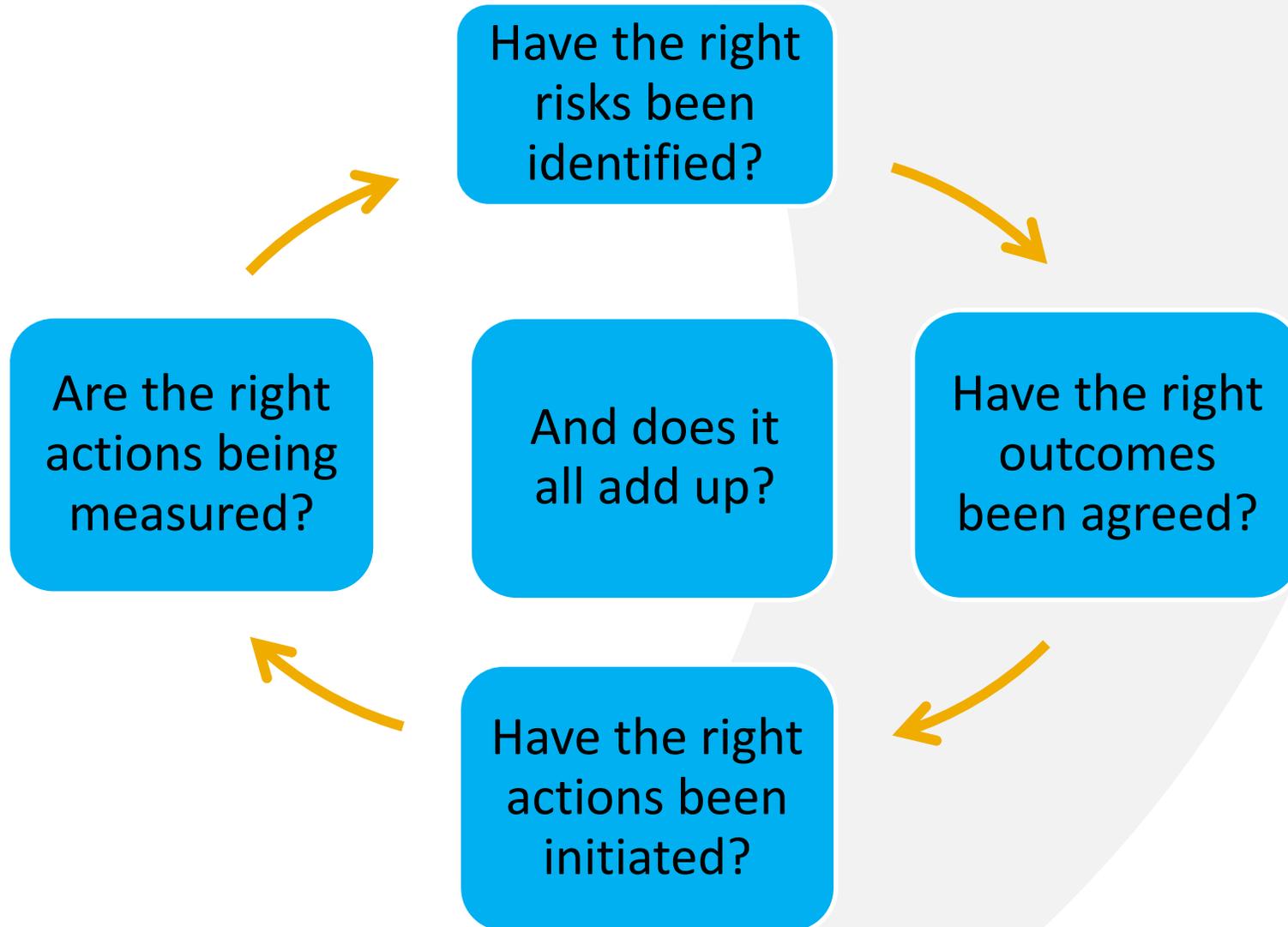
Service providers to develop Safety Management Systems (SMS)
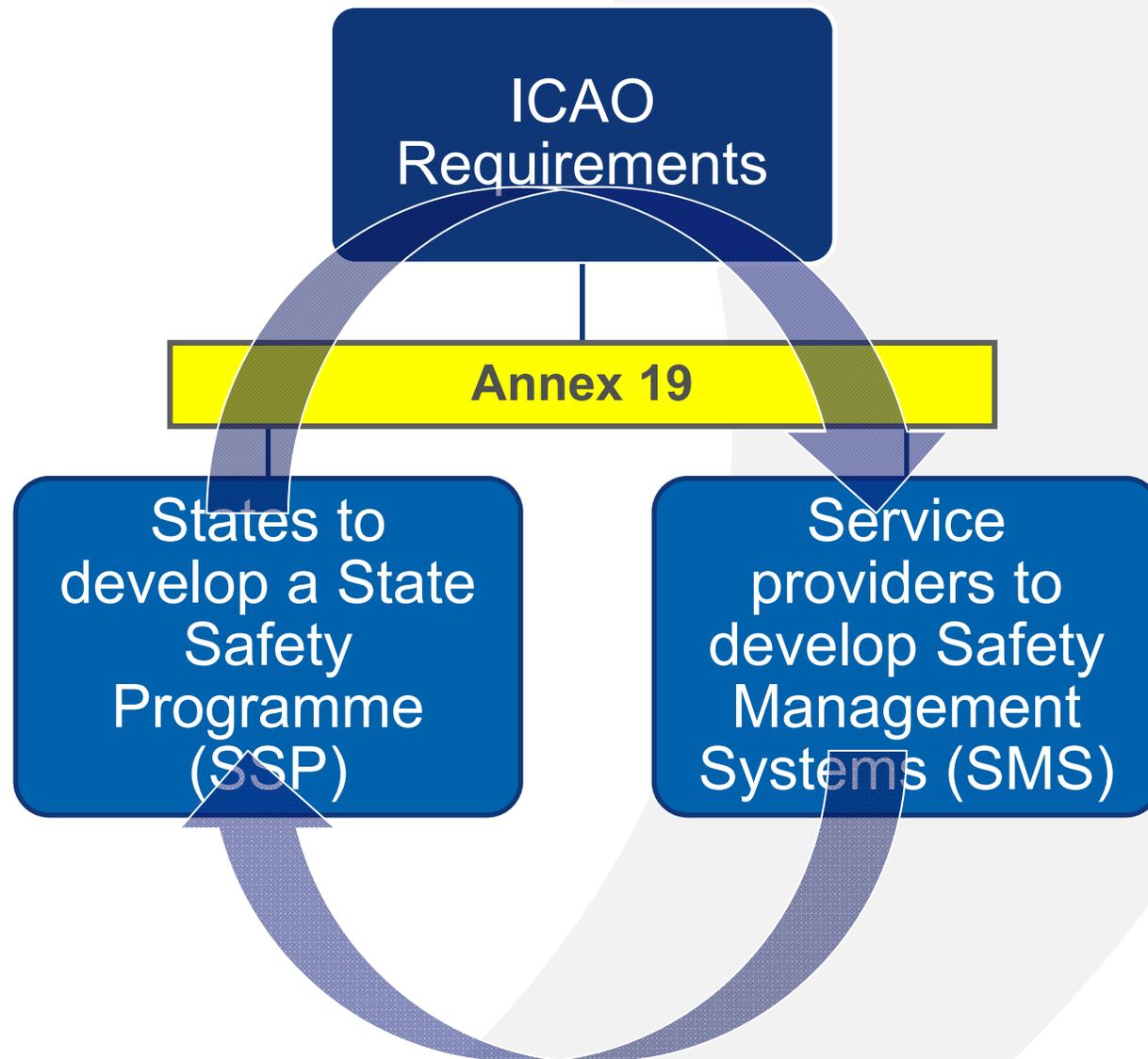
ICAO Safety Management requirements

- **Annex 19 2nd edition**

The State Safety Programme

SSP inputs

Accident Investigation Reports

Safety data and information

Mandatory and Voluntary Reports

Surveillance data and intelligence

State Safety Programme (SSP)

SSP outputs

Promotion of a positive culture

State Safety Policy and Safety Objectives

Regulations and supporting guidance

Safety Information

Surveillance activities

National Aviation Safety Plan

SSP Overview
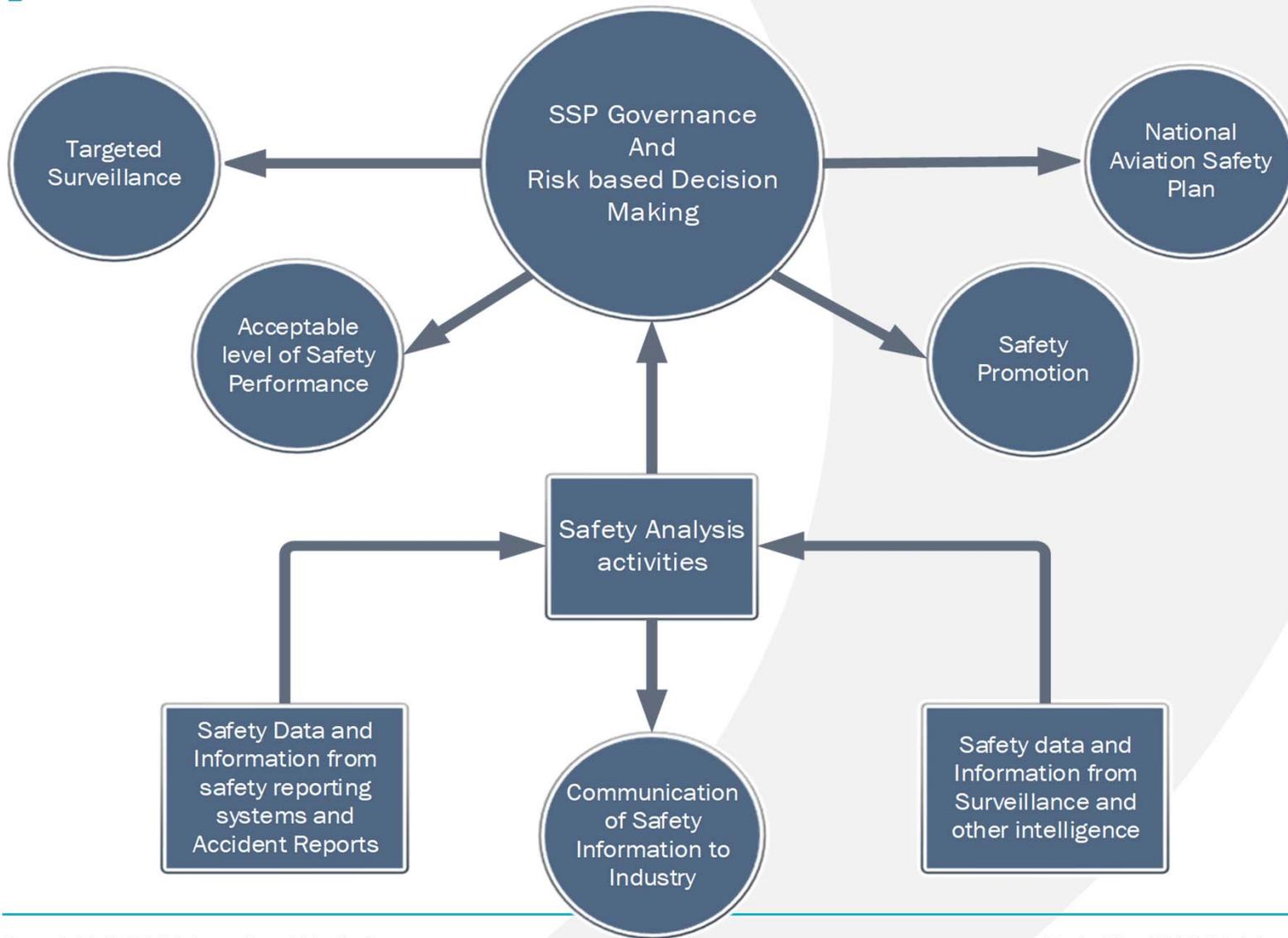
State Safety Programme Functions

- Identifying and managing state safety issues and risks

- Analysing safety data and information

- Defining the ALoSP

SSP

- Monitoring State Safety Performance

- Monitoring how the ALoSP will be achieved

Acceptable Level of Safety Performance

*Annex 19: An acceptable level of safety performance for the State can be achieved through the **implementation and maintenance of the SSP** as well as **safety performance indicators and targets** showing that safety is effectively managed and built on the foundation of **implementation of existing safety-related SARPs.***

- An effective SSP that is managing State risks
- Demonstrated through meaningful SPIs and SPTs
- Based on compliance with ICAO SARPs

Defining your ALoSP

Questions that need to be answered:

- What is the State risk appetite for aviation? Or……How safe do we want the State aviation system to be?

- Who will make that decision?

- Who will be responsible for monitoring and managing it?

- What State SPIs and SPTs are needed to monitor and measure achievement of an ALoSP?

Acceptable Level of Safety Performance

- **Focus on what is important**
    - Commercial aviation
    - Significant aviation risks
- **Can be defined in State Safety Objectives**
    - Supported through State SPIs and SPTs

What are your aviation safety risks?

- What is happening globally?

- What is happening regionally?

- What is happening locally?

- What are the emerging risks?

- What is changing?

- What is your industry's views?

CAA Significant 7 Outcomes

Loss of Control In-flight (Flight Management)

Runway Excursion

Collision on Runway

Mid Air Collision

Controlled Flight into Terrain

Unsafe Aircraft Environment

**Loss of Control** (due to Ground Services)

Are our Significant 7 your Significant 7?

- Which of them apply to you?

- Which are more significant to you and your industry?

- What is your number 8?

UK Risk Wheel
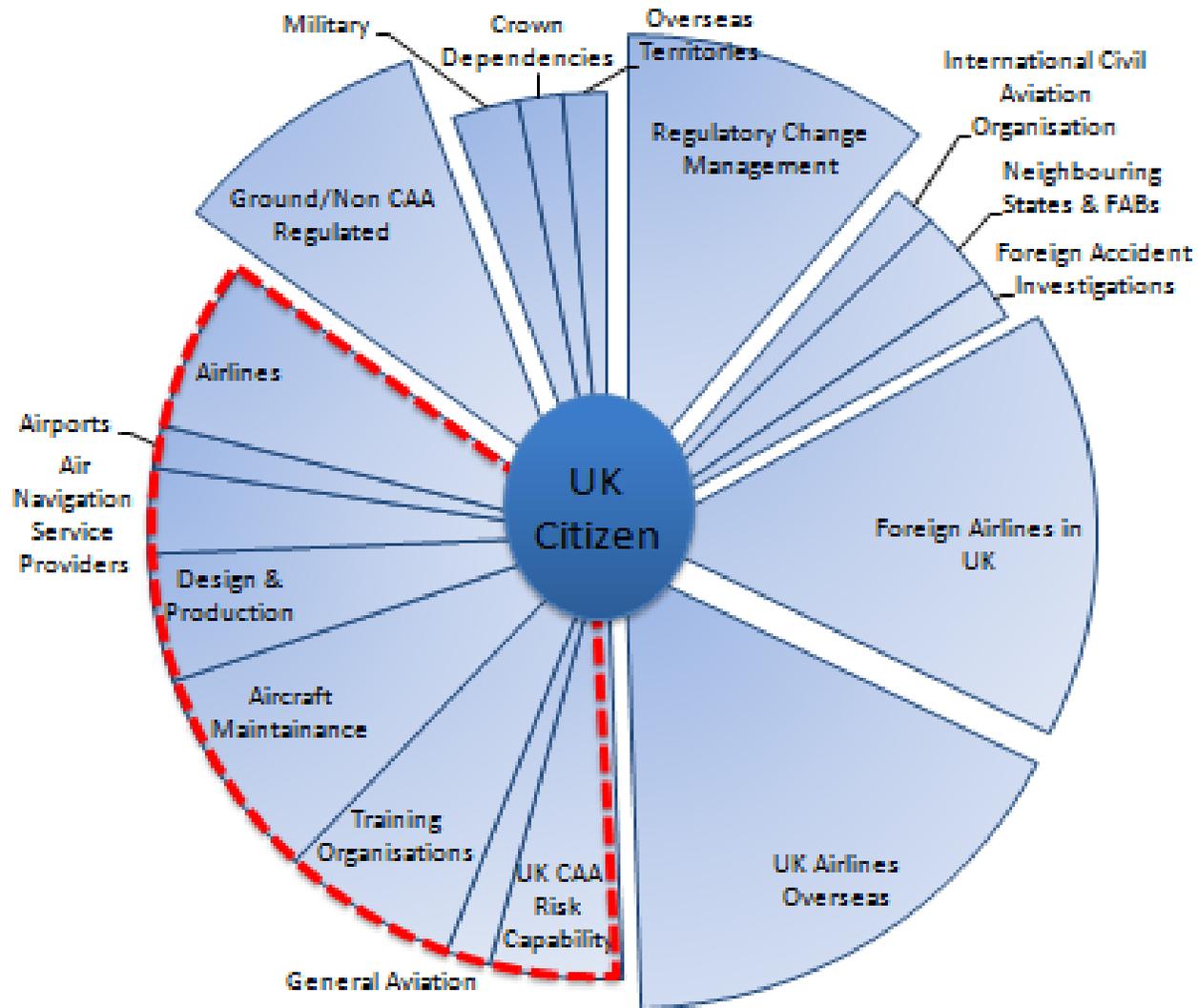
SSB Governance

- Director General of Civil Aviation
- Government representative
- Accident Investigation Body
- CAA and other regulatory bodies
- Military Aviation representative
- Industry?

Safety Leadership Board

Decide

Resource

Be Accountable

Safety Committee

Challenge

Give Direction

Endorse

SSP personnel

Staff to:

- Manage the National Aviation Safety Plan
- Manage the Safety Data Collection, Analysis and Processing system
- Analysis of the data held
- Manage and coordinate the SSP and the governance body
- Manage and maintain the SSP gap analysis and SSP Protocol Questions
- Promote safety information

UK State Safety Programme

UK SSP website

UK State Safety Programme

The UK has one of the world's leading aviation industries.

Introduction

❯ About the programme

Policy, objectives and resources

❯ The UK aviation system
❯ State Safety Programme stakeholders
❯ UK aviation safety policy
❯ Acceptable level of safety performance
❯ State safety objectives

UK Acceptable Level of Safety Performance

No accidents involving commercial air transport that result in serious injuries or fatalities.

No serious injuries or fatalities to third parties as a result of aviation activities.

This is achieved through State safety objectives that:

- Protect people from aviation safety risks.

- Reinforce the UK position as a global leader in aviation safety.

- Positively influence aviation safety through collaborative working with our international partners.

UK State Safety Objectives

- No fatal accidents in commercial air transport Aeroplanes where the UK has State oversight responsibility.

- No fatal accidents in commercial air transport Helicopters where the UK has State oversight responsibility.

- No fatal accidents involving people on the ground in the UK as a result of an aviation accident.

UK Secondary State Safety Objectives

- We act to reduce the likelihood of UK citizens being involved in an aviation accident anywhere else in the world by supporting and influencing global aviation safety.

- Embed an effective State Safety Programme that delivers our Acceptable Level of Safety Performance.

UK State Safety Performance Monitoring

- Currently 20 State SPIs (see CAA website)
- Continuous monitoring and analysis of safety data
- Surveillance data vs Safety reporting data
- Internal safety risk reporting system
- Internal safety assurance review
- Independent safety assurance review

State Safety Programme Primary Objectives

| Commercially Operated **Fixed Wing**	Commercially Operated **Rotary Wing**	On the Ground

This dashboard is the initial design to provide the SSB with an overview of how we are achieving our primary state safety objectives. This is based on a series of State Safety performance indicators that are aligned with the State Safety Objectives, to indicate how close the UK is to an accident and not achieving our state safety objectives. This is currently based on an analysis of high severity and low severity MORs from 2015 to the end of 2017. This uses analysis of the data in conjunction with subject matter expertise from across the CAA to agree the red and green status.

The current status for all three State Safety Objectives is GREEN.
Current priority areas of focus for the CAA are; Dangerous Goods that could lead to an aircraft fire and Pilot Performance Calculation errors that could lead to either a loss of control event or a runway excursion.

Safety Performance Indicators

AIRBORNE CONFLICT	CFIT	FIRE (non impact)	GROUND HANDLING	LOSS OF CONTROL	RUNWAY EXCURSION	RUNWAY INCURSION
ACAS & RA	Hard Warnings	Fire	Aircraft Damaged (prior to flight)	People Performance	People Performance	Aircraft
Airprox	Soft Warnings	Smoke & Fumes	Weather	Technical Failure	Technical Failure	Person
Infringements			Loading Errors	Weather	Weather	Vehicle
Level Bust						
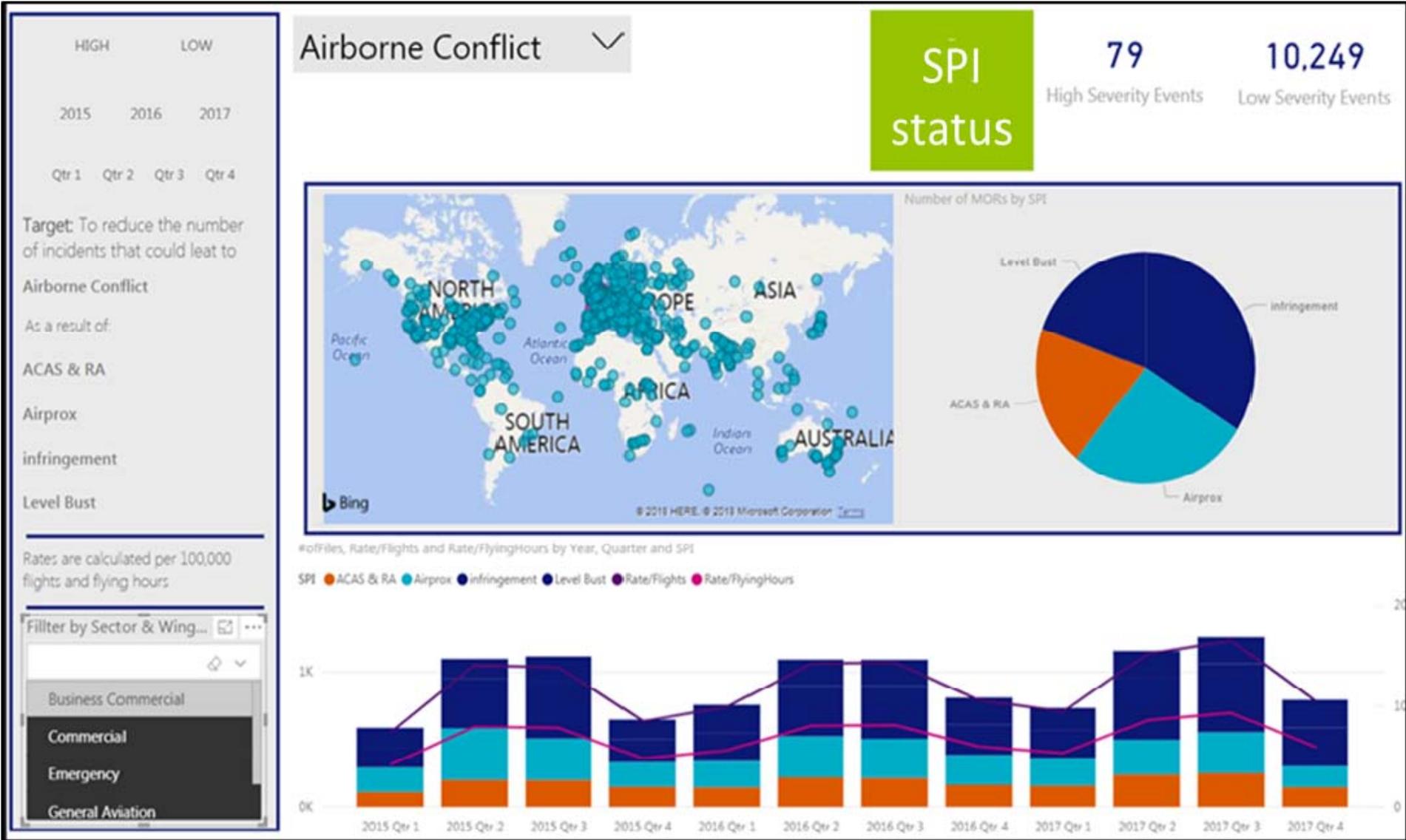
Secondary Objectives

State Safety Partnerships

- Safety Issue 1
- Safety Issue 2
- Safety issue 3

State Safety Programme

- SMICG SSP effectiveness Score
- ICAO Effectiveness of Implementation score
- Effective of safety plan actions

Part of the UK CAA International Group

Do we have the right data?
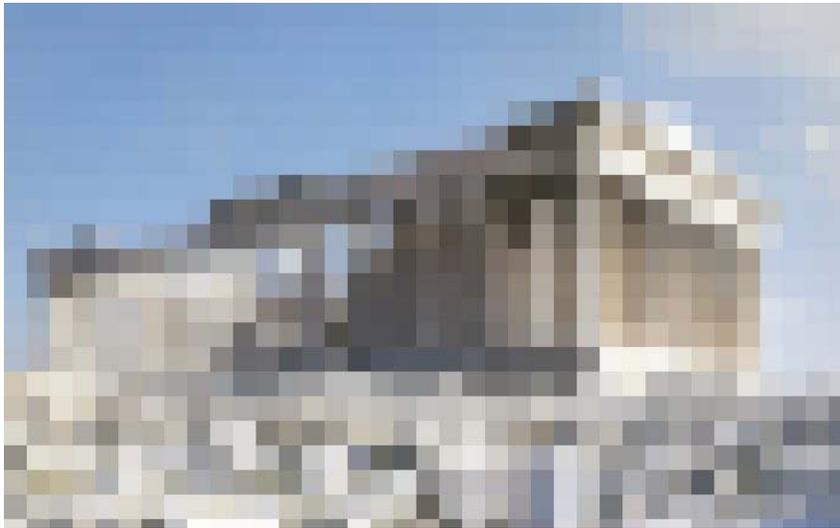
- An effective SSP should provide a better risk picture
- The collection and analysis of that data over the wider aviation system will help deliver an even better risk picture

State Safety Performance Targets

- Better to define a direction of travel

- Needs an action to achieve a target

- May be misleading:

  - Focus on quantity not quality

  - Can drive the wrong behaviours

  - Can 'cap' innovation and continuous improvement

  - Management and staff drift towards achieving the target rather than doing the 'day job'

  - Can significantly impact reporting systems

Part of the UK CAA International Group

Agreement of Service Provider SPIs and SPTs

- Not a formal process

- Carried out as part of SMS surveillance

- No mandatory SPIs or SPTs

  - Should consider State Safety Objectives and SPIs

- Our focus is on continuous improvement

Drivers for Performance Based Oversight

- EASA requires:
  - an effective SMS
  - a proportionate oversight programme
  - Has flexibility provisions to vary audit cycle
- ICAO Annex 19 3.3.2 Prioritisation of surveillance that targets areas of greater concern
- ICAO SMM includes a risk based surveillance system

Performance Based Oversight

Risk to the Aviation System **+** Compliance with Regulations **+** SMS Effectiveness **+** Safety Performance **=** Performance Based Oversight

Part of the UK CAA International Group
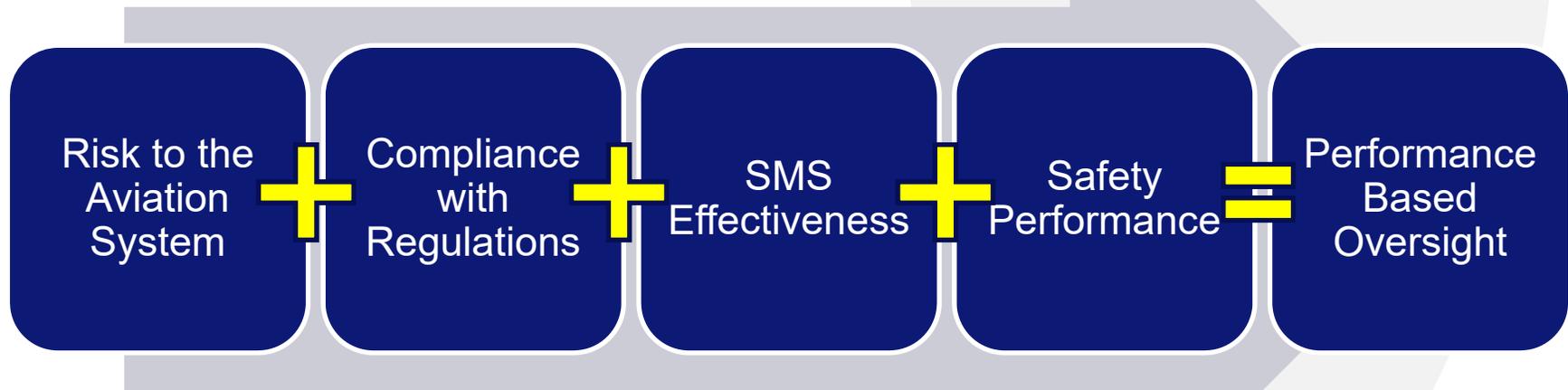
UK Performance Based Oversight Process

Sector risk picture

Other sources

Incidents, accidents and issues

Internal review meeting

Entity performance data

CAA risk picture

Conversation with entity

Overall risk picture for entity

Highly complex

Quite complex

Less complex
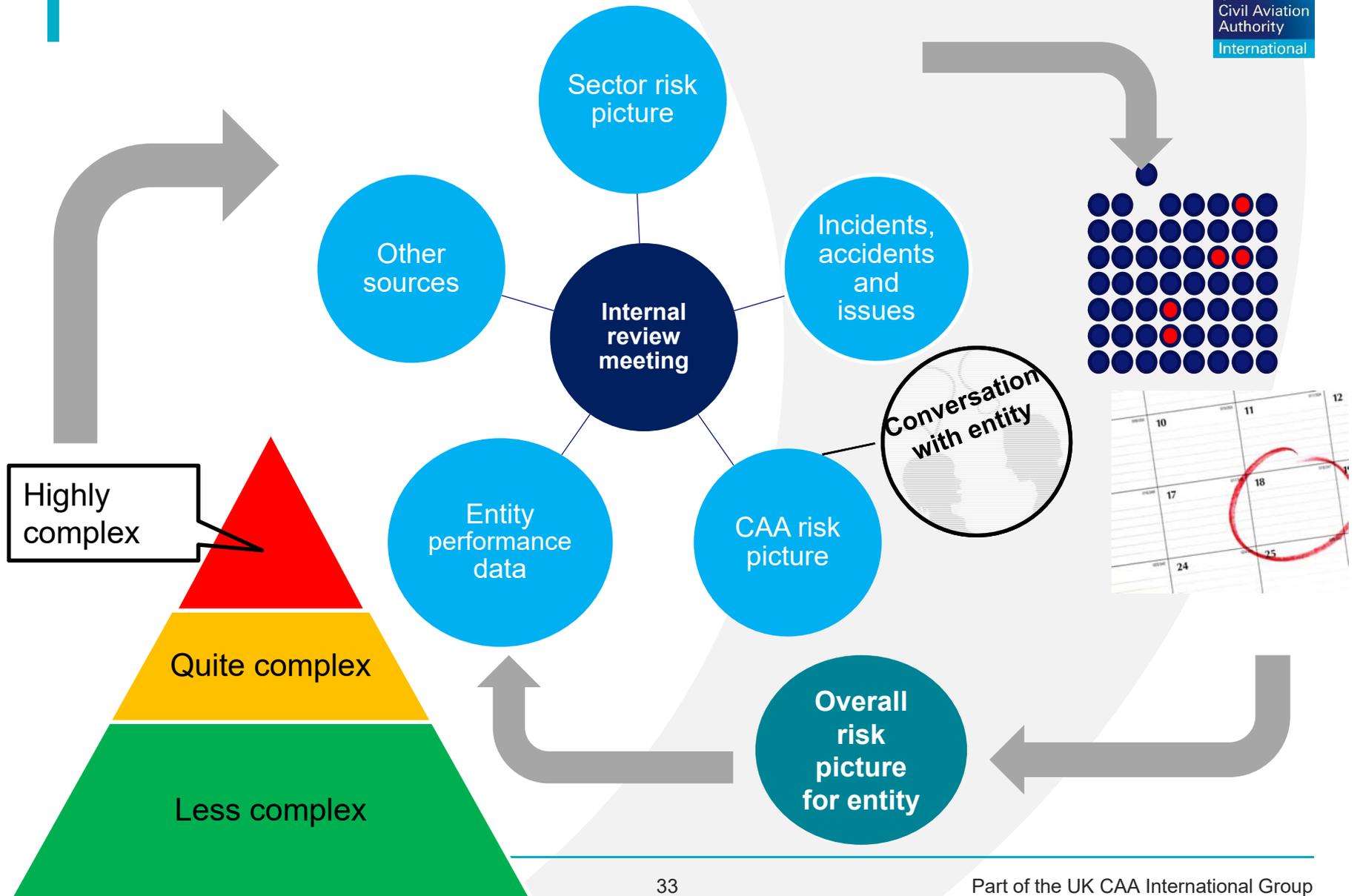
SSP Challenges

- How to make sense of the data

- Static risk vs dynamic risk

- How to provide feedback to industry

- Risk Classification schemes

- ALoSP

  - State Safety Objectives measured through:
  - State SPIs and SPTs

What are your SSP challenges?

- Implementation of a safety data collection and processing system?

- Protection of the safety data you hold?

- Understanding your State aviation risks and prioritising them?

- Establishing your ALoSP and a means to monitor it?

- Establishing State Safety Objectives, Safety Performance Indicators and Targets?

- Moving your SSP from a document to a continuous activity to manage State aviation safety?

- Assessing the SMS of your Service Providers?

- Moving towards risk-based surveillance?

Things to consider for SSP implementation

- Sharing of safety information

- Sharing of resources and expertise

  - Network of analysts

  - SMS evaluation tools

  - Joint training activities

  - Software solutions

- Greater collaboration with industry

- Use of external expertise

- Industry safety workshops

SMS Surveillance

ICAO Annex 19

SMS Definition

"A systematic approach to managing safety, including the necessary organizational structures, accountabilities, policies and procedures."

- How many of you are currently involved in safety management?
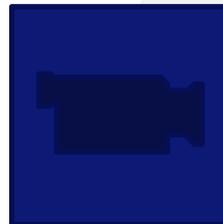
Integrated Management System

Compliance and Risk Management

Regulations

Common cause

Safety risks

Risk Management

Unique cause

Compliance Monitoring

Quality and Compliance

The regulators cut

'Do the right thing first time'

Management and resources

Quality assurance / Compliance monitoring
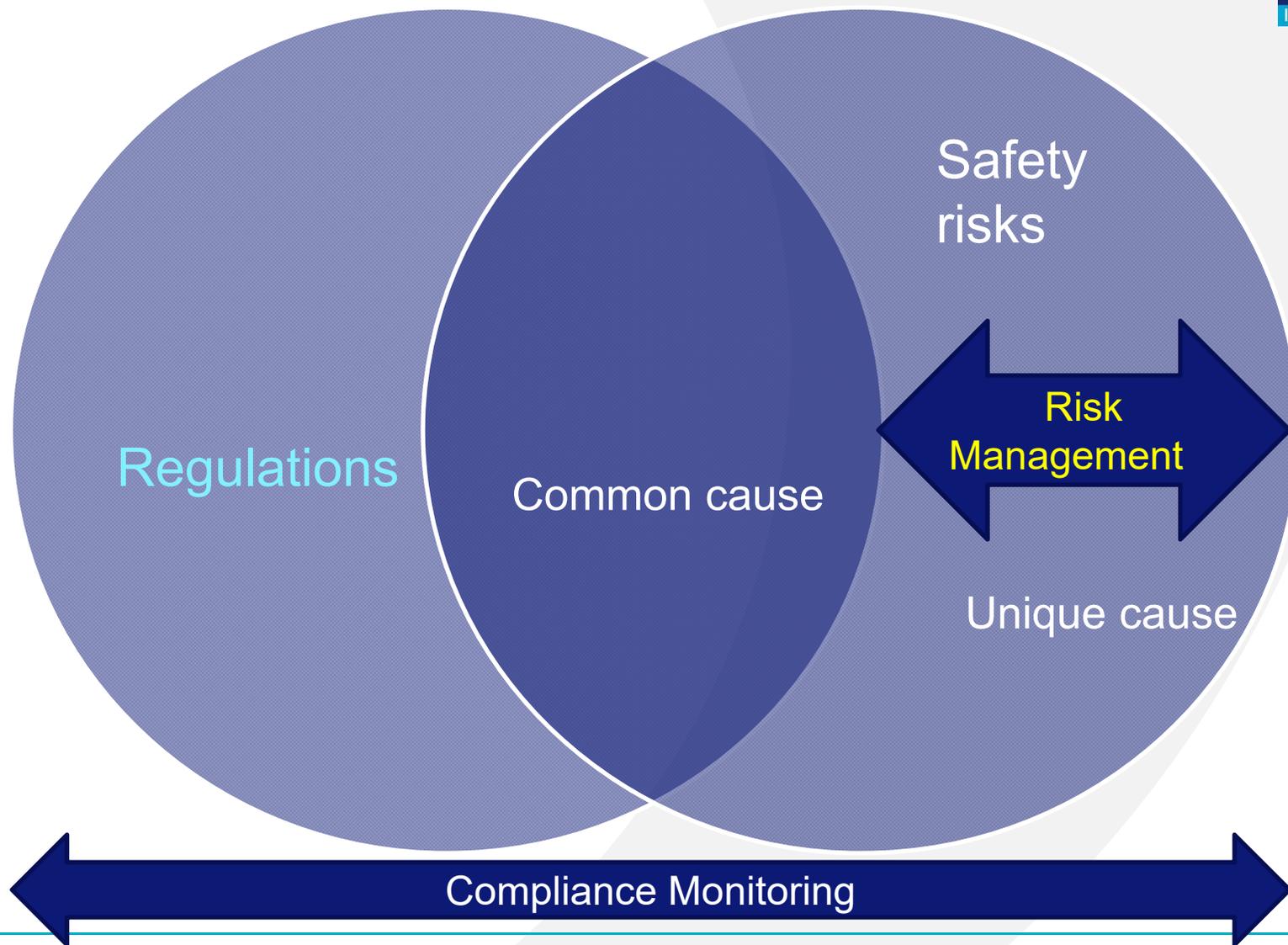
Integrated risk management

Interface management

- External organisations can generate risks to the organisation
  - They need to know what they are
  - They should look at their risk register
  - What is their reporting culture like?
- External organisations also protect the organisation
  - Are they applying the risk mitigations as agreed?
  - Who is assessing how effectively they are applying the agreed risk mitigations?
- Assurance of contractors
  - Should include compliance and safety risk assurance

Interface Management

- Requires collaboration between organisations
- Changing Conversations
- For Safety Critical contractors:
  - Are they invited to safety meetings?
  - Are they able to attend their safety meetings?
- Training and Promotion
  - Do they understand the reporting system and what should be reported?
  - Do they provide training or workshops for safety critical contractors?
  - Do they pass safety information to their contractors?

SMS evaluation

Infinity

Best Practice and towards excellence

Operating and Effective

Present and Suitable

Phase 2

Phase 1

SMS Maturity

Continued SMS oversight

A
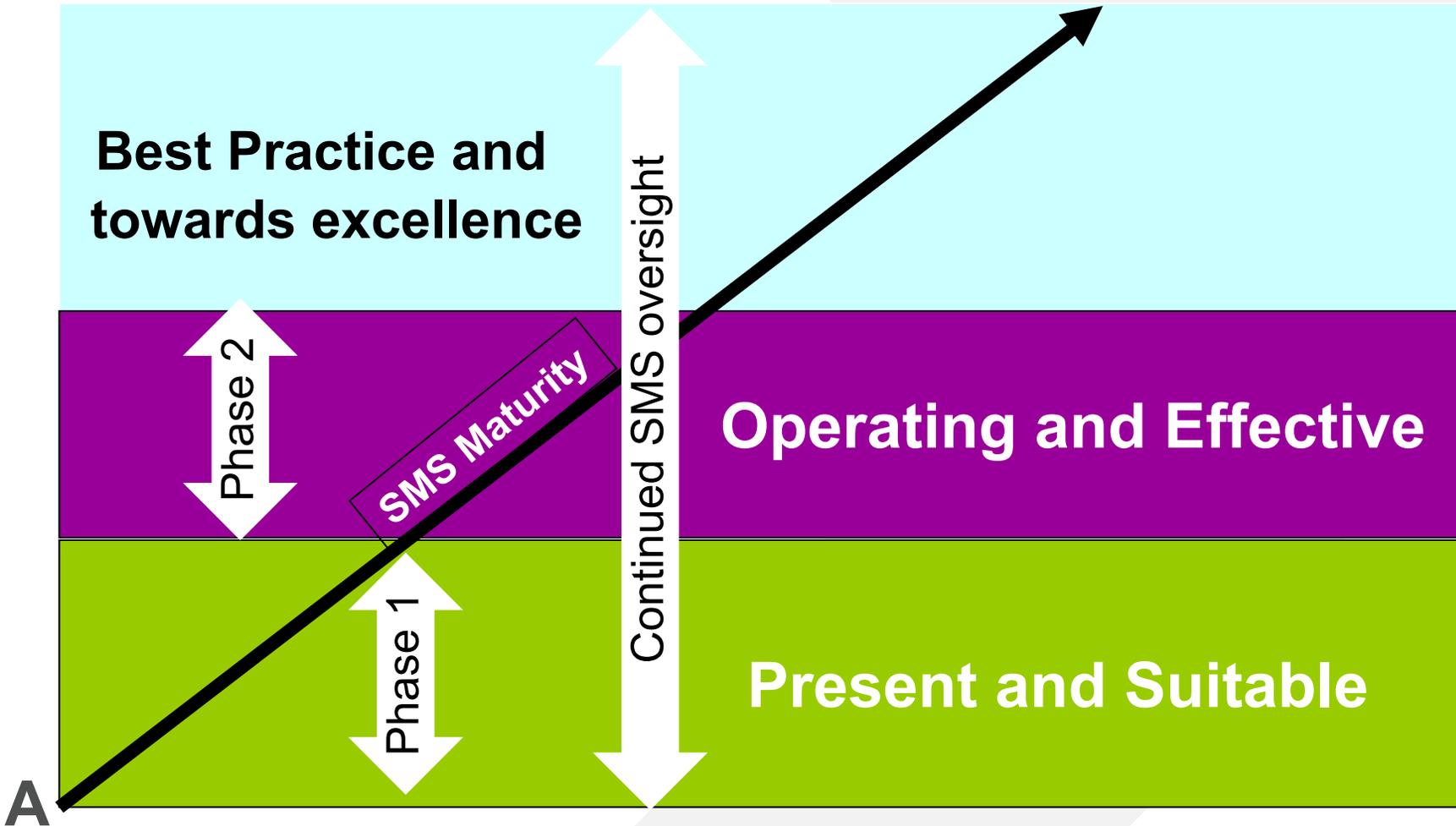
UK Phase 1 Gap analysis tool

- Used by industry as a gap analysis tool

- Assessment against the ICAO framework / CAA guidance Material

- Are all the building blocks in place?

- Separate Phase 1 tool for complex and non-complex organisations

- The SMS evaluation tool can also be used for a phase 1 assessment

Part of the UK CAA International Group

2.1 Hazard Identification

The organisation shall develop and maintain a formal process that ensures that aviation hazards are identified. This should include the investigation of incidents and accidents to identify potential hazards. Hazard identification shall be based on a combination of reactive, proactive and predictive methods of safety data collection.

2.1.2 Is there a process for establishing how hazards are identified and from what sources?	Y	SMSM Section 2	Describes hazard identification and risk assessment processes	Accepted
2.1.3 Is there a confidential safety reporting scheme that encourages errors, hazards and near misses to be reported by staff?	Y	SMSM 1.2, 3.5.4	Details confidential reporting	Just culture policy and culpability flow chart used
2.1.4 Is there feedback to the reporter and the rest of the organisation?	P	SMSM 3.5.4	Feedback will be reported to the company but not the individual	This will need to be addressed to encourage further reporting
2.1.5 Does Hazard identification include reactive, proactive and predictive schemes?	N			The operator should review the up to date version of ICAO doc 9859 and current CAA guidance material as well as the ORO GEN 200 material on Risk Assessment to ensure it has a full understanding of Hazard ID etc.
2.1.6 Have the major hazards and risks been identified and assessed for the organisation and its current activities?	N		These will be reviewed once the SMSM is finalised	
2.1.7 Are safety investigations being carried out to identify underlying causes and potential hazards?	P		This work is being initiated	
2.1.8 Are the hazards identified from safety investigations addressed and communicated to the rest of the organisation?	Y	SMSM 3.5.5	The SC will send recommendations to the rest of the company if required	accepted

Compliance vs. Performance

- Compliance is still part of the regulators tool kit and has brought safety a long way.

- SMS effectiveness and safety performance should take it further.

- SMS evaluation looks for compliance (present and suitable) and performance (operating and effective)

- PSOE approach developed by the SMICG

- Used in the EASA Management System assessment tool

UK CAA SMS Evaluation Tool

- Used for Phase 2 evaluation and continued SMS surveillance

  - Individual markers (indicators)

  - Summary of SMS effectiveness based on the 4 ICAO SMS components

- Additional elements:

  - Compliance Monitoring System (Internal audit)

  - Interface management

The PSOE Approach

- **Present:** There is evidence that the 'marker' is clearly visible and is documented within the organisation's SMS Documentation

- **Suitable:** The marker is suitable based on the size, nature, complexity and the inherent risk in the activity

- **Operating:** There is evidence that the marker is in use and an output is being produced

- **Effective:** There is evidence that the element or component is effectively achieving the desired outcome

Assessment of Individual Markers

COMPLIANCE + PERFORMANCE MARKERS		P	S	O	E	How it is achieved	What to look for	CAA Remarks
1.1.1	There is a confidential reporting system that complies with EU 376/2014 to captures errors, hazards and near misses that is simple to use and accessible to all staff and provides appropriate feedback to the reporter and where appropriate, to the rest of the organisation.						Reporting System (in addition to MORs) is available to all personnel and is in use; Staff familiar with it; Review how data protection and confidentiality is achieved? Assess volume, content and quality of reports Evidence of feed back to reporter, the organisation and third parties. Safety reports are acted on in a timely manner. Check availability to contracted organisations and customers to make reports.	
1.1.2C	Personnel express confidence and trust in the organisations reporting policy.						Question all levels of personnel; Number and variety of safety reports; Evidence of self reporting; Feedback from staff surveys.	

PSOE in practice

For example: There is an electronic safety reporting system only but not everyone has access to a computer

The Safety Reporting Form is 6 Pages long

There are 8 different types of Safety Reporting Forms

An operator of 12 aircraft with 120 Operational staff and a 'suitable' reporting system

- Total 9 safety reports submitted this year

- Total 50 safety reports (further analysis show that 3 are Aviation safety related the rest are all health and safety related)

- Total 90 safety reports this year (last year it had 73)

SMS Evaluation Summary

	Initiating	Present and suitable	Operating	Effective	Excellence
The SMS as a whole	The SMS is at the implementation stage	All the main elements of the SMS are in place	The systems and processes of the SMS are operating.	The SMS is working in an effective way and is striving for continuous improvement	The organisation is an industry leader and embraces and shares its best practice
Safety Risk Management	The safety risk management processes are not fully developed	A safety reporting system is in place and there is a process for how risks are assessed and managed	The hazard and risk registers are being built up and risks are starting to be managed in proactive manner.	The organisation is continuously identifying hazards and understands it biggest risks and is actively managing them and this can be seen in their safety performance. Safety Risk management is proactive.	Key Personnel throughout the organisation are aware and understand the risks relative to their responsibilities and are continuously searching out new hazards and risks and re-evaluating existing risks
Safety Assurance	Safety assurance activities including SPIs are not fully developed	Initial SPIs linked to the safety objectives have been identified and there is a management of change process in place	The Organisation has established SPIs that it is monitoring and is auditing and assessing its SMS and its outputs	The organisation assures itself that is has an effective SMS and is managing its risk through audit, assessment and monitoring of its safety performance.	The organisation is continuously assessing it approach to safety management and is continuously improving its safety performance and seeking out and embracing best practice
Safety Policy and Objectives	Policies, processes and procedures are not fully developed	There are policies, processes and procedures in place that detail how the SMS will operate.	There is a safety policy in place and Senior Management are committed to making the SMS work and is providing appropriate resources to safety management.	Senior Management are clearly involved in the SMS and the Safety Policy sets out the organisations intent to manage safety and is clearly evident in the day to day operations	The organisation is an industry leader and embraces best practice
Safety Promotion	Safety promotion activities are not fully developed	There is a training programme and the means to communicate safety information is in place.	The organisation has trained its people and has several mediums for safety promotion that it uses for passing on safety information	The organisation puts a considerable resource and effort into training its people and publicising its safety culture and other safety information and monitors the effectiveness of its safety promotion	In addition, the organisation provides training and safety promotion to its contracted service providers and assesses the effectiveness of its safety promotion
Human Factors Management	Human Factors is considered but not formally captured by the organisation.	Human Factors policies and processes have been defined and documented where required by regulation.	Human Factors is being managed across the organisation and is starting to be integrated into the organisation's SMS.	Human Factors is integrated into the SMS and the operations of the organisation. All staff including management are aware of human factors and apply it in the way they work.	Human Factors is embedded into the day to day activities of the organisation and fully integrated into the SMS. This is evident throughout the organisation from senior management to front line staff.

Challenges for the Regulators

- Many aspects of SMS are subjective

- Need to look beyond the Manual

- Is safety management part of how they do business?

- The regulator needs to:
  - encourage and guide industry to get it right
  - have the flexibility to adapt our approach as we gain more experience
  - be satisfied that organisation's within our oversight are managing safety appropriately

- We need to put Safety Management into our inspector's comfort zone

Safety I versus Safety II

- ## Safety I

  - What went wrong

  - As few things as possible go wrong

  - People are seen as a liability

- ## Safety II

  - What went right

  - As many things as possible go right

  - People are seen as a resource

- ## Effective safety management needs both

Moving towards Safety II

Systems Thinking for Safety: Ten Principles.

The Advance of Technology and Innovation…..
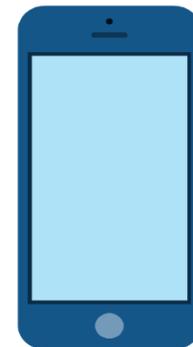
~30 Years

?? Years

The Advance of Technology and Innovation…..

FL2500+

FL660

FL600

FL245

FL195
FL95

3000ft

500ft

SFC

CAA EXPANDING REMIT

UK Civil Aviation Authority International

Safety Management Challenges

- Need to look beyond the data
  - Qualitative data
  - Intelligence gathered and analysed
- What about emerging risks?
  - Drones
  - Cyber security
  - Technical innovation
  - Air Taxi Drones
- What about the elephants in the room
  - Commercial pressure
  - Resources
  - The Judiciary and protection of confidentiality

Summary

- An overview of a State Safety Programme

- Some of the SSP implementation challenges

- How the UK has implemented its SSP

- How to carry out SMS surveillance

Any Questions?