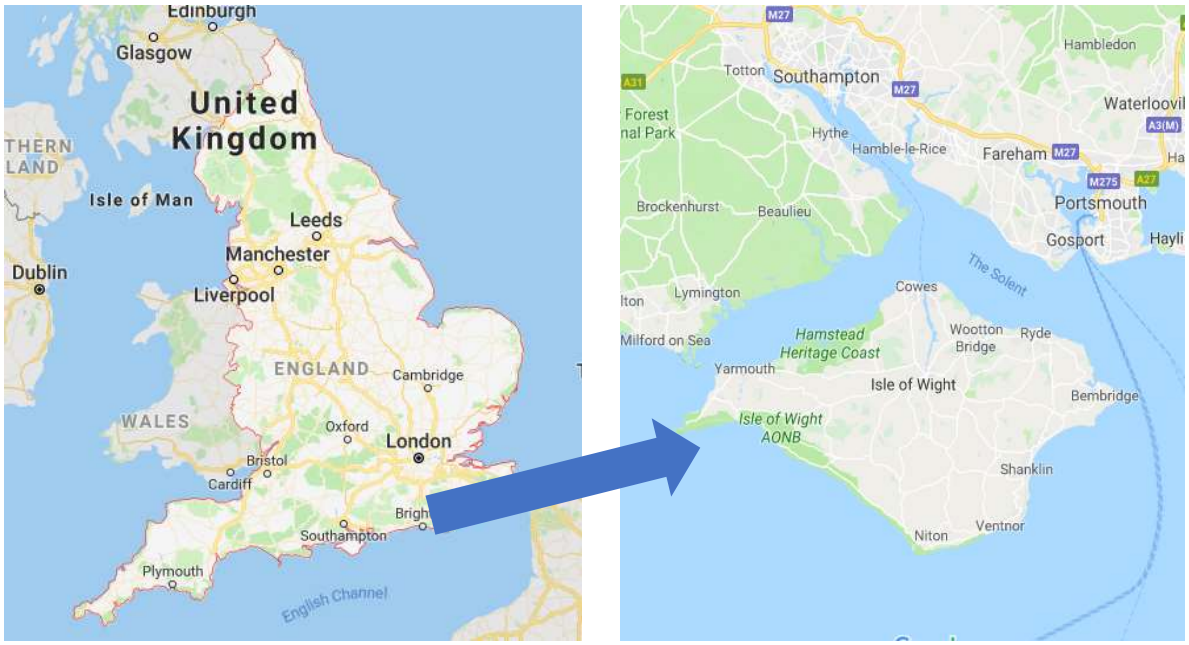
Measuring Safety Performance

Jo Gillespie

Jo Gillespie

- 30 years and 14,000 hours as a pilot
- Military, general, business and commercial
- 30+ years in aviation safety & risk management
- 17 years Emirates Flight Safety
- Accident/incident investigations
- Flight safety programmes
- SMS implementation
- Expert witness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English Channel
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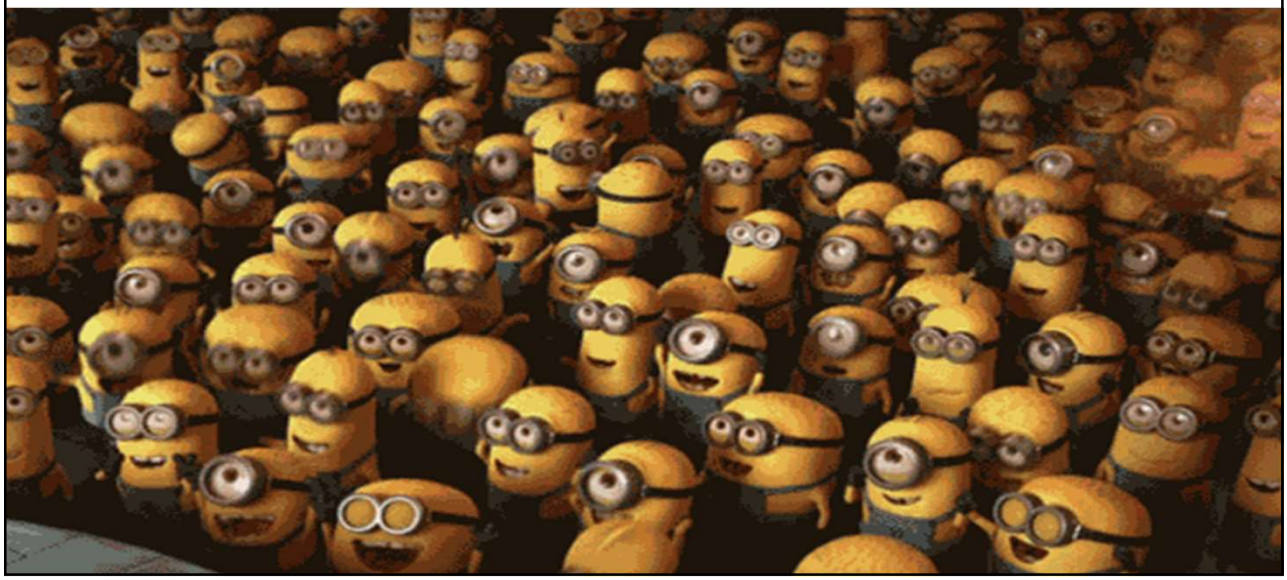
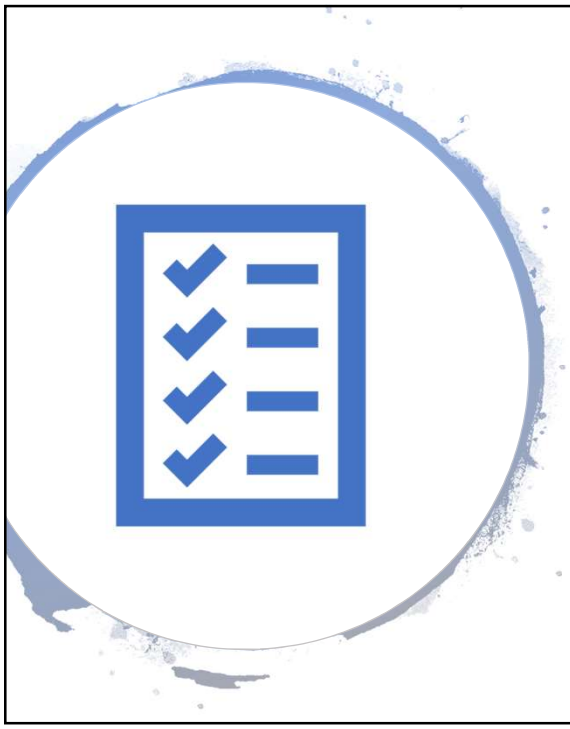
Totton
Southampton
Hambledon
Waterloovil
Forest
Hythe
Hamble-le-Rice
Fareham
Brockenhurst
Beaulieu
Portsmouth
Gosport
Lymington
Cowes
The Solent
Milford on Sea
Hamstead Heritage Coast
Wootton Bridge
Ryde
Yarmouth
Isle of Wight
Bembridge
Isle of Wight AONB
Shanklin
Niton
Ventnor

Who are you?



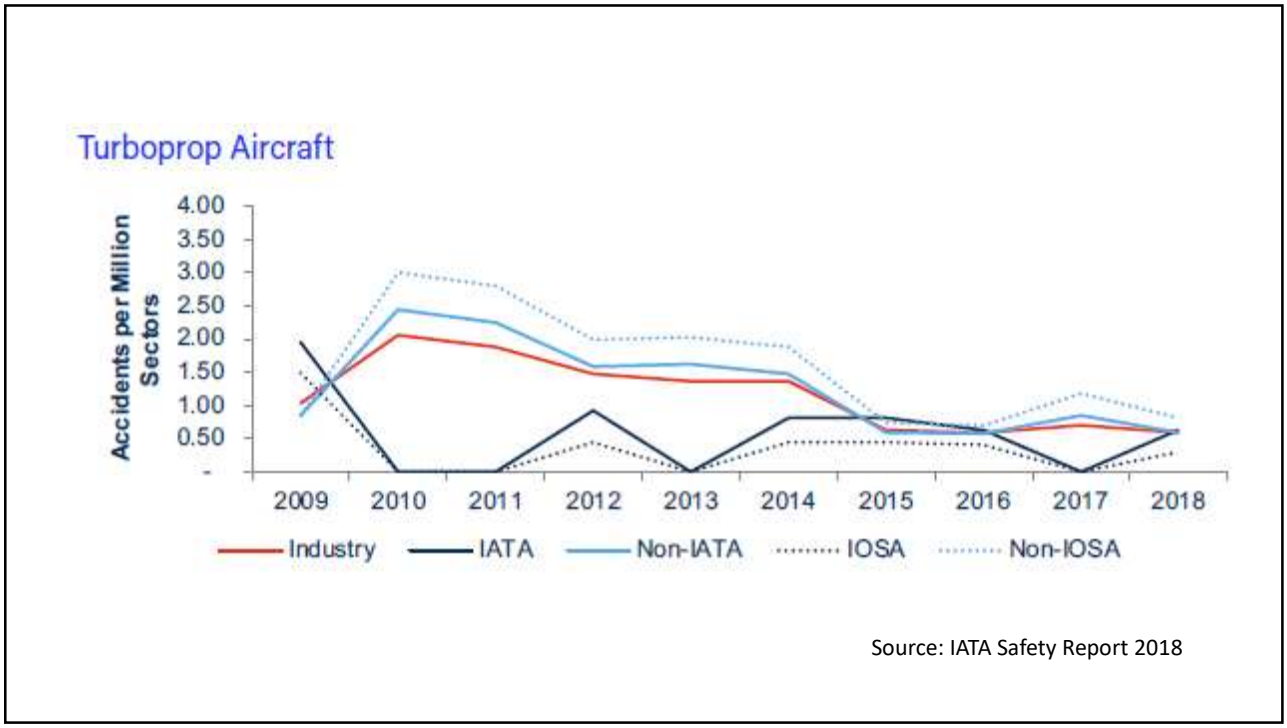


Session Overview

- The case for SMS
- Acceptable level of safety
- Safety policy
- Safety objectives
- Safety performance indicators & targets
- Integrated safety plan

Ground Rules

- Emergencies
- Phones
- Timing
- Breaks
- Participation
- Challenges
- Objectives



Source: IATA Safety Report 2018

Number of Fatalities and Fatal Accidents

Source: IATA Safety Report 2018

Evolution of Aviation Safety

Post World War II:

The TECHNICAL Era

Evolution of Aviation Safety

Improved engineering & technology:

The HUMAN Era

Evolution of Aviation Safety

Humans do not function in isolation:

The ORGANISATIONAL Era

SPECIAL ISSUE 253

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(Legislative Supplement No. 20)

LEGAL NOTICE NO. 91

THE CIVIL AVIATION ACT

(No. 21 of 2013)

THE CIVIL AVIATION (SAFETY MANAGEMENT) REGULATIONS, 2018

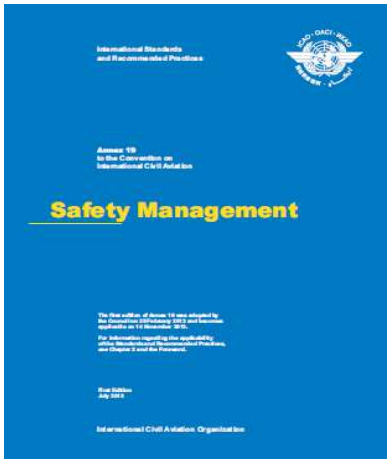
ARRANGEMENT OF REGULATIONS

PART I—PRELIMINARY

What is Safety Management?

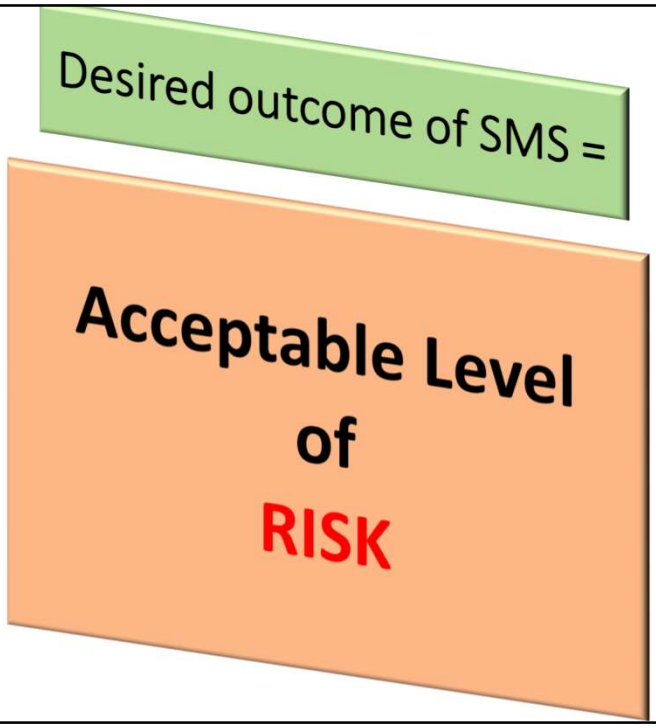
Safety management seeks to proactively mitigate safety risks before they result in aviation accidents and incidents.

Performance-based approach, focused on the **desired outcome** rather than just compliance.



ICAO Annex 19 defines safety as:

"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**"

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Acceptable Risk

https://www.youtube.com/watch?v=9vc90pFkXRU

Or…

An Acceptable Level Of Safety Performance

How well
does the organisation
deliver an acceptable level of
SAFETY PERFORMANCE?

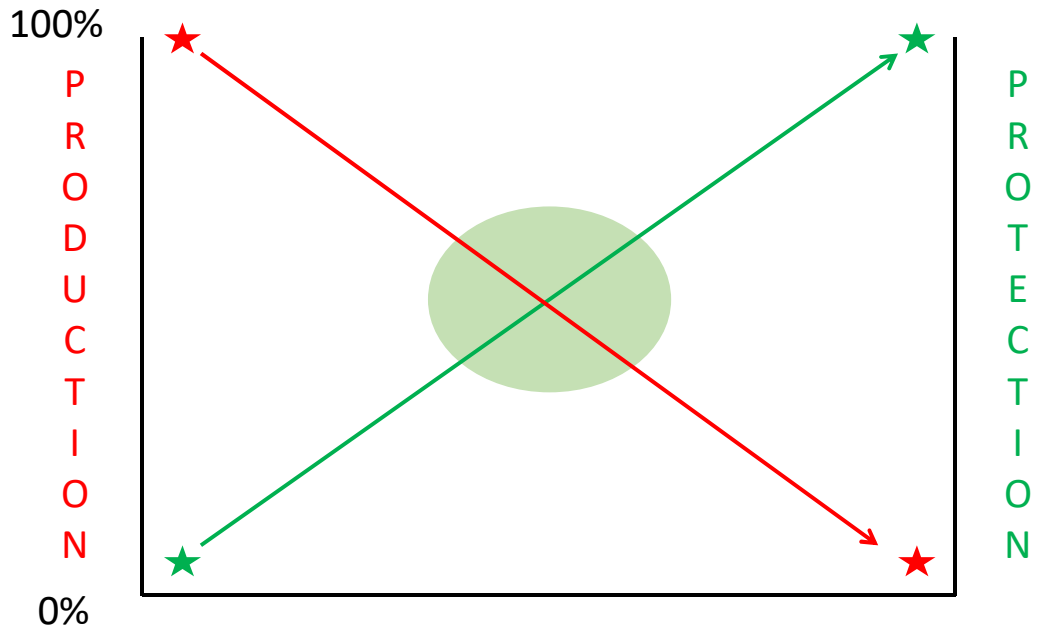


Table 10. Components and elements of the ICAO SMS framework

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

Safety Policy

To reflect the organization's commitment to safety, the safety policy should include a commitment to:

a) continuously improve the level of safety performance;

b) promote and maintain a positive safety culture within the organization;

c) comply with all applicable regulatory requirements;

d) provide the necessary resources to deliver a safe product or service;

e) ensure safety is a primary responsibility of all managers; and

f) ensure it is understood, implemented and maintained at all levels.

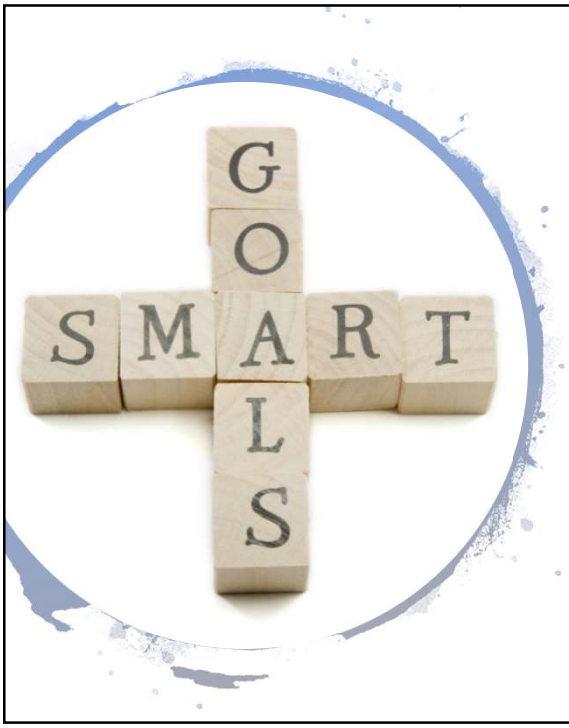
Safety Policy

The safety policy should make reference to the safety reporting system;

Inform of the disciplinary policy applied in the case of safety events;

Visibly endorsed by senior management and the accountable executive

Club Owners' Objectives?



Setting Objectives

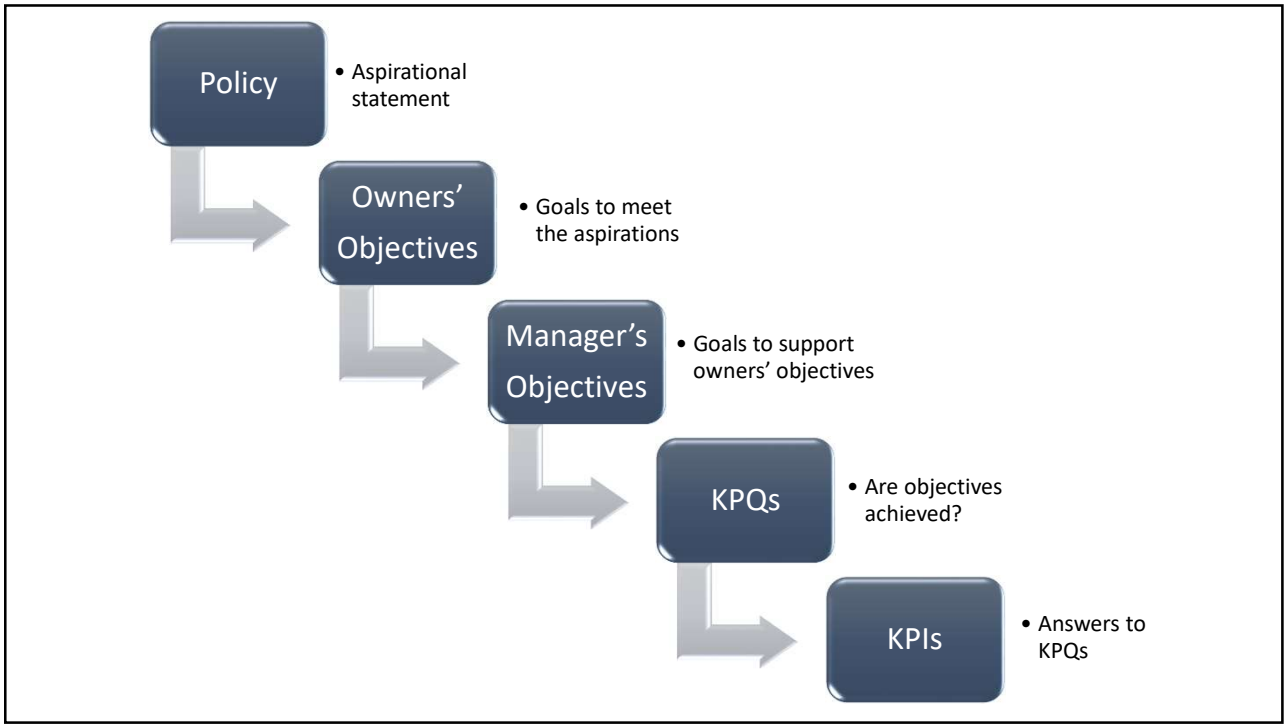
- ✓ **S** - Specific
- ✓ **M** - Measurable
- ✓ **A** - Achievable
- ✓ **R** - Relevant
- ✓ **T** - Time-based

Key Performance Questions
(KPQ)

How well do we meet our objectives?

Key Performance Answers

Key Performance Indicators (KPIs)



- Safety aspirations & intentions

Safety Objectives

- Taking into consideration its safety policy, establish safety objectives to define what it aims to achieve in respect of safety outcomes;
- Safety objectives should be short, high-level statements of safety priorities and should address the most significant safety risks;
- Reflect strategic achievements or outcomes related to safety concerns

What else should safety objectives be?

- **SMART**

Don’t crash..!

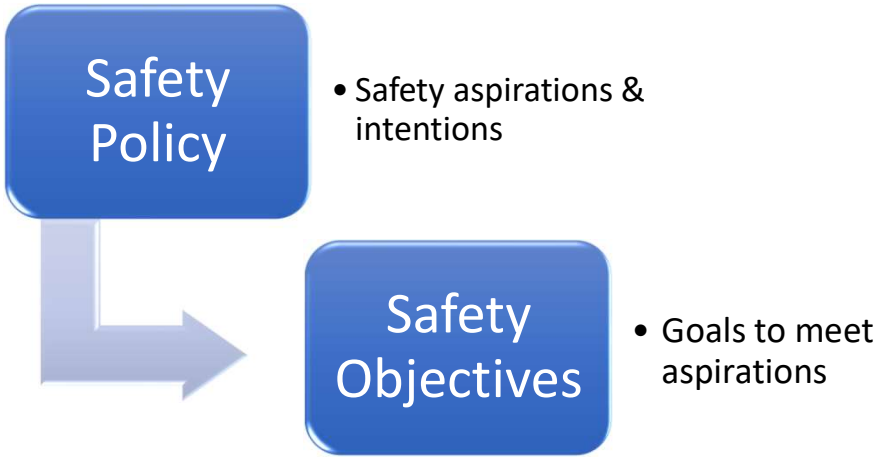
Objectives to deliver the Safety Policy

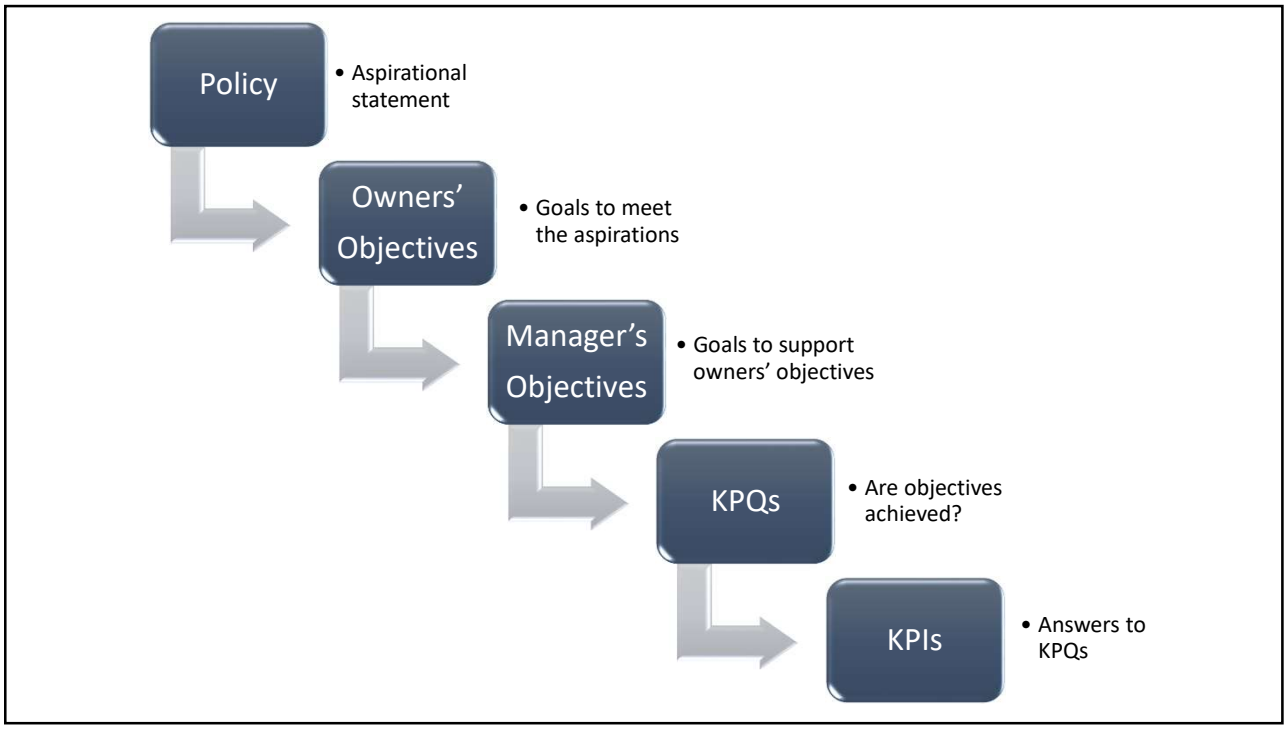
In groups devise some objectives which support and help deliver your Policy

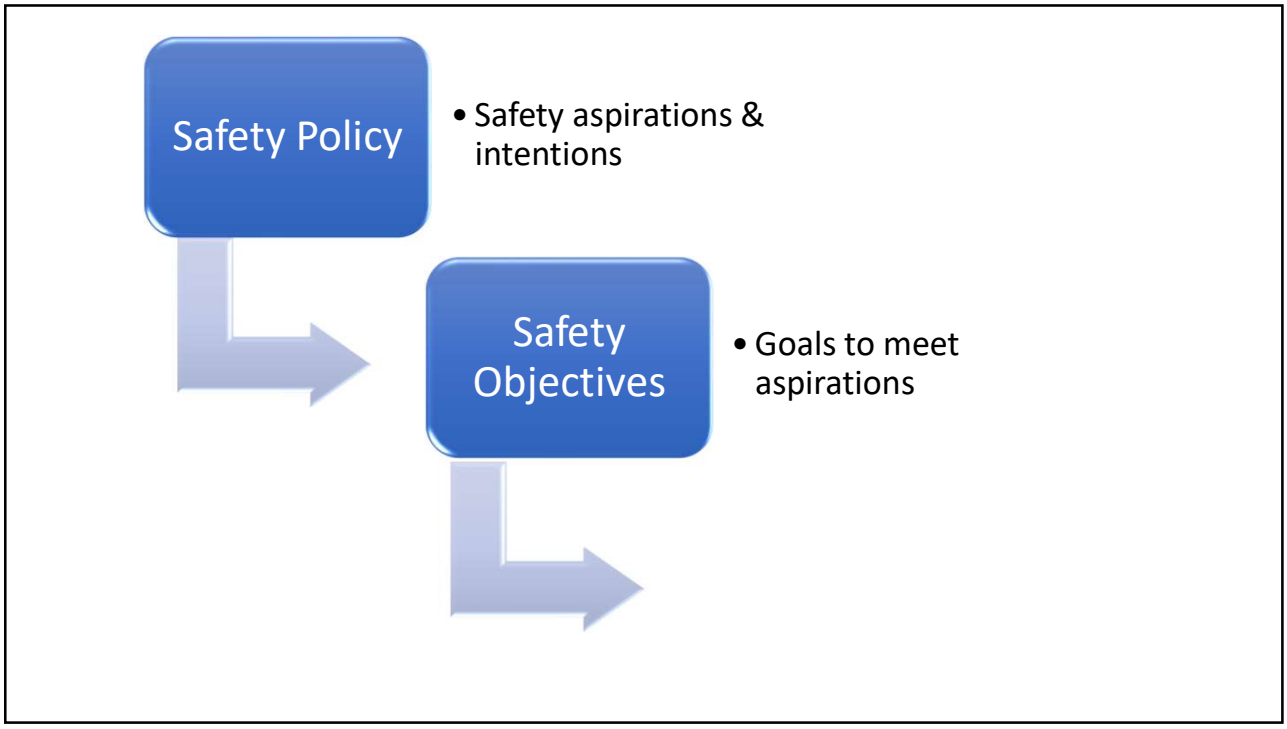
Remember SMART

Safety Objectives

Zero harm to people, property and the environment




Policy
• Aspirational statement
Owners' Objectives
• Goals to meet the aspirations
Manager's Objectives
• Goals to support owners' objectives
KPQs
• Are objectives achieved?
KPIs
• Answers to KPQs


Safety Policy
• Safety aspirations & intentions
Safety Objectives
• Goals to meet aspirations

Safety Performance Questions

Objective: **Zero harm to people, property and the environment**

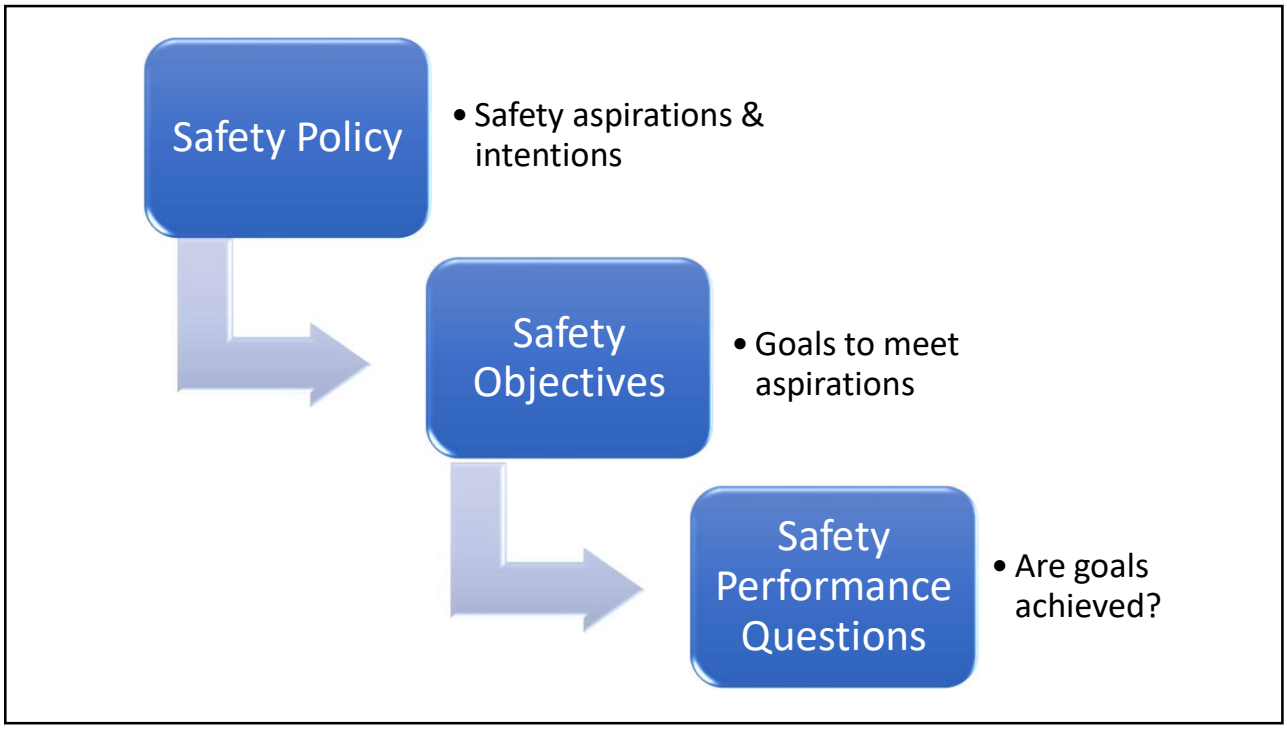
SPQ: ***Has anyone been injured during the period?***

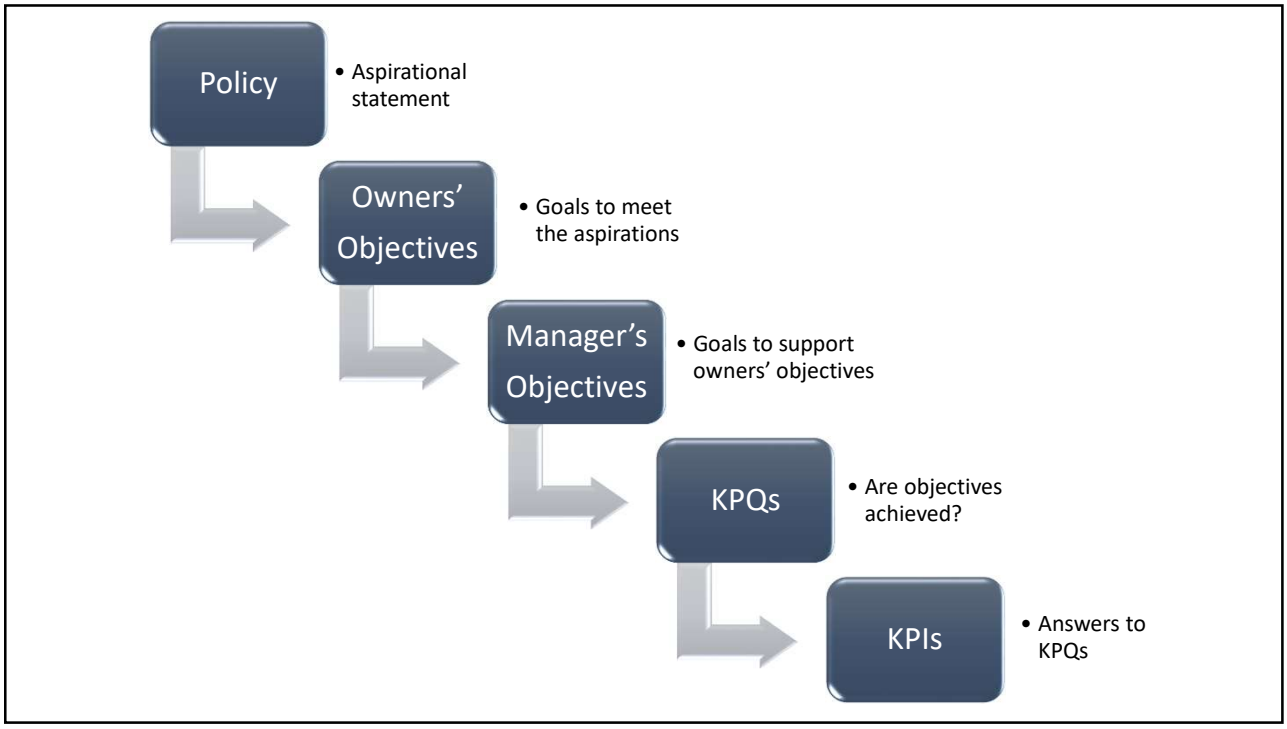
SPQ: ***Were there any equipment damage reports in the period?***

SPQ: ***What impact have operations had on the environment in the period?***

Safety Performance Questions

For each of your objectives devise one or more SPQs


Safety Policy
• Safety aspirations & intentions
Safety Objectives
• Goals to meet aspirations
Safety Performance Questions
• Are goals achieved?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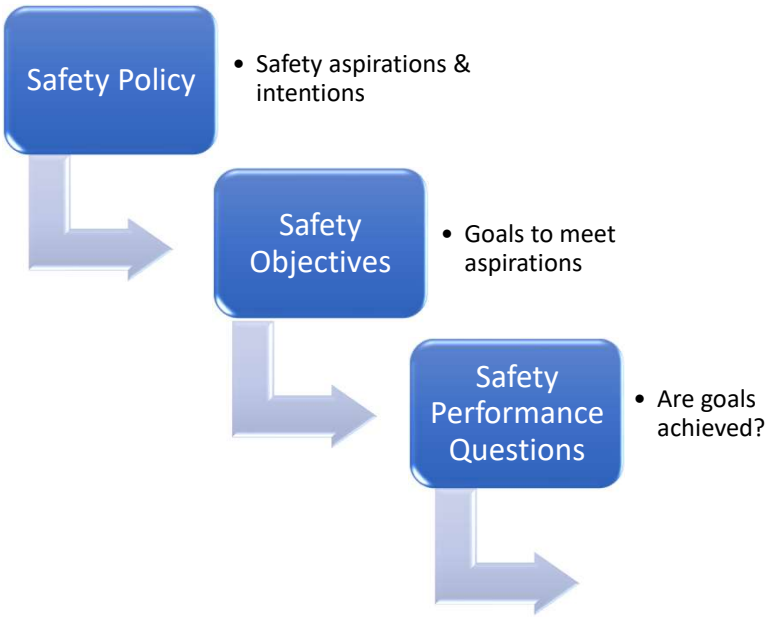
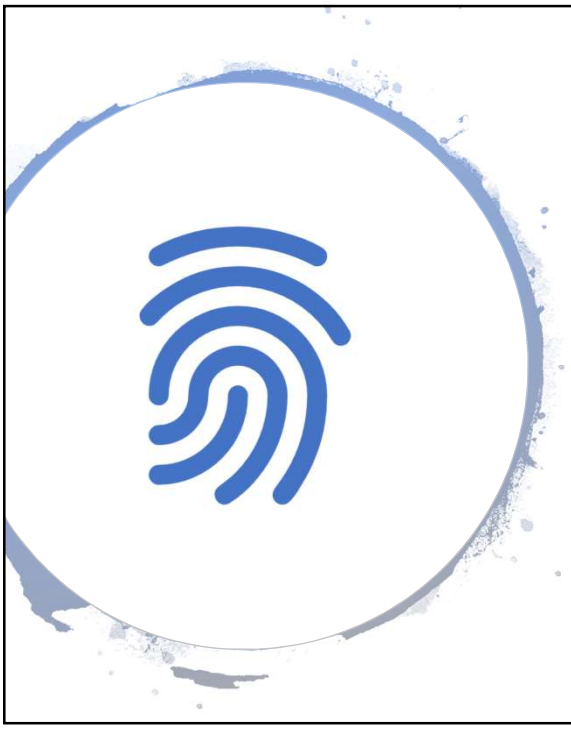


Safety Performance Indicator (SPI)

A data-based parameter used for monitoring and assessing safety performance

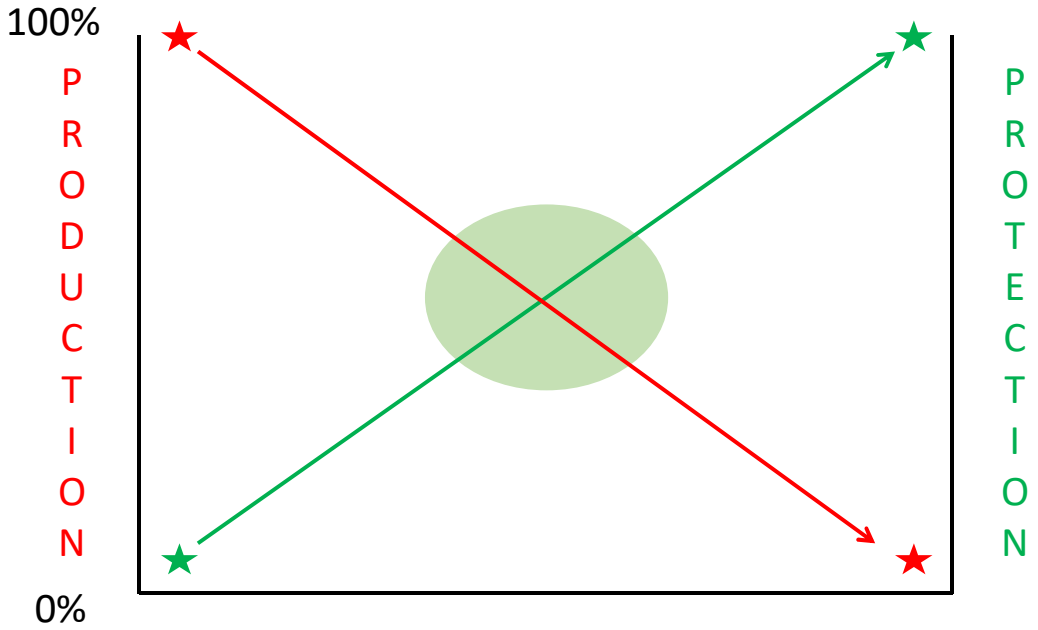


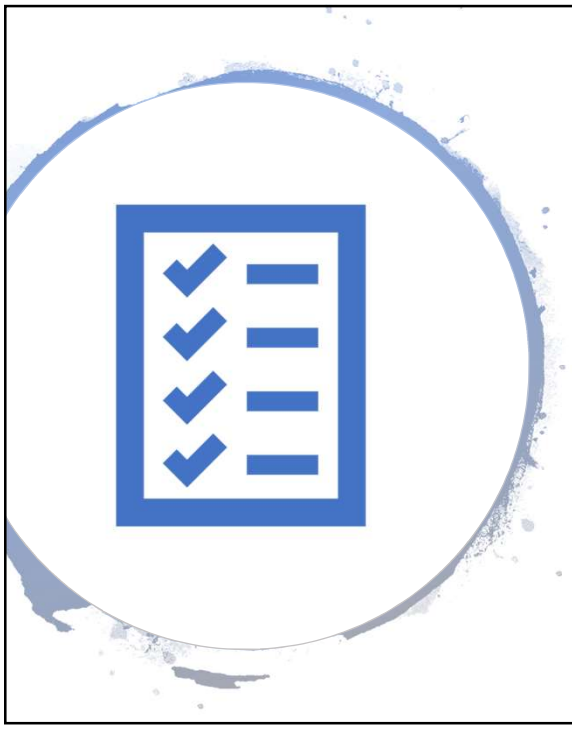
What are SPIs?

…the parameters that provide the organization with a view of its safety performance:

- where it has been;
- where it is now; and
- where it is headed,

in relation to safety





Sources of Safety Performance Data:

- Analysis of Occurrence/Hazard reporting
- Safety studies
- Safety surveys
- Safety audits
- Investigations
- Operational data

SPIs

Quantitative Indicators
- Number
- Rate
- Requires statistical significance

Number of runway incursions

Runway excursions per sector

Qualitative Indicators
- Evaluation
- Informed assessment
- Comparison

Periodic SMS review

Safety culture survey

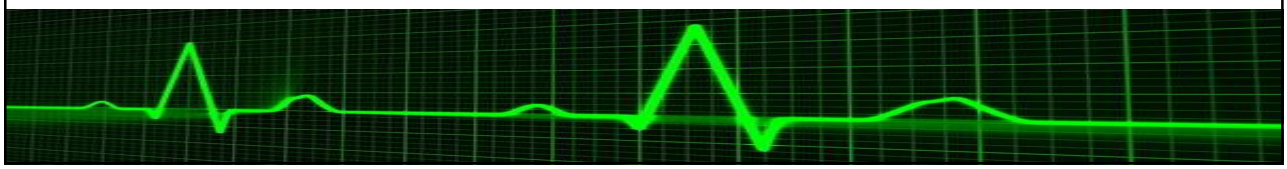
SPIs

Lagging indicators
- Historical events
- Generally undesirable

- Number of birdstrikes
- FOD ingestion damage

Leading indicators
- On-going events
- Generally desirable

- Bird scaring patrols
- FOD sweeps



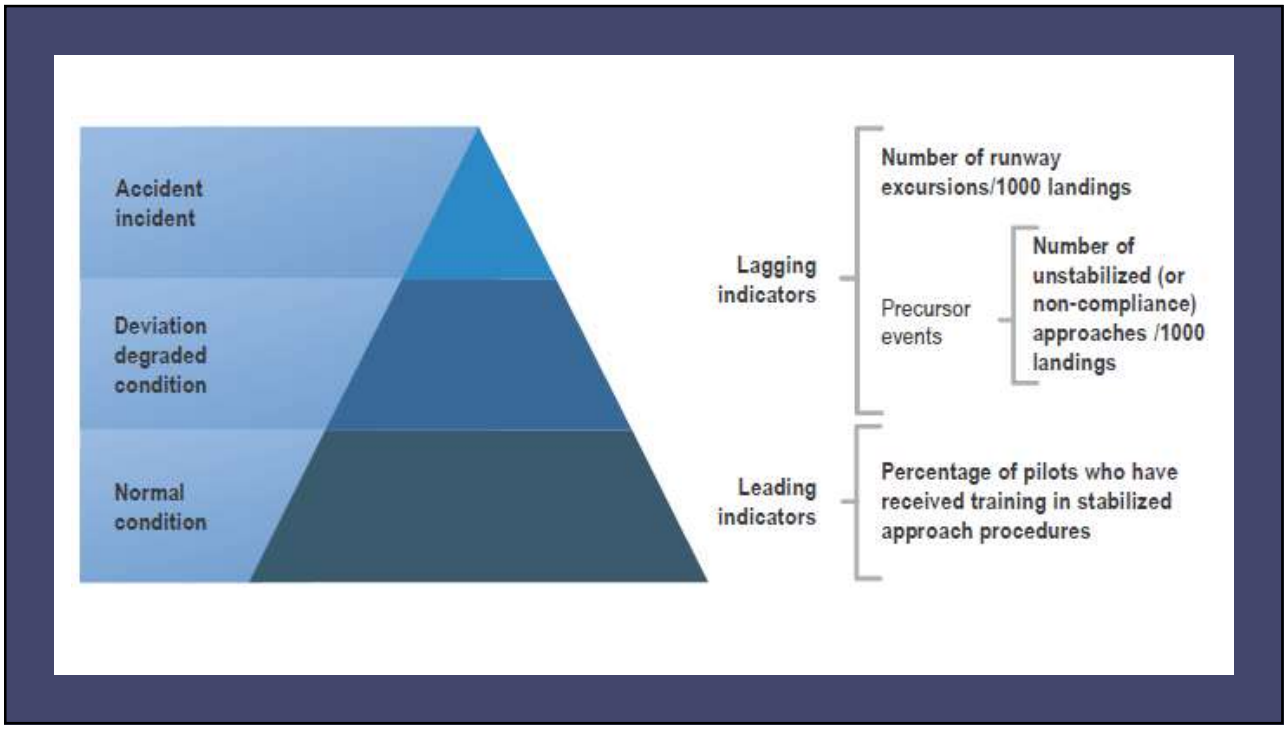
Lagging Indicators

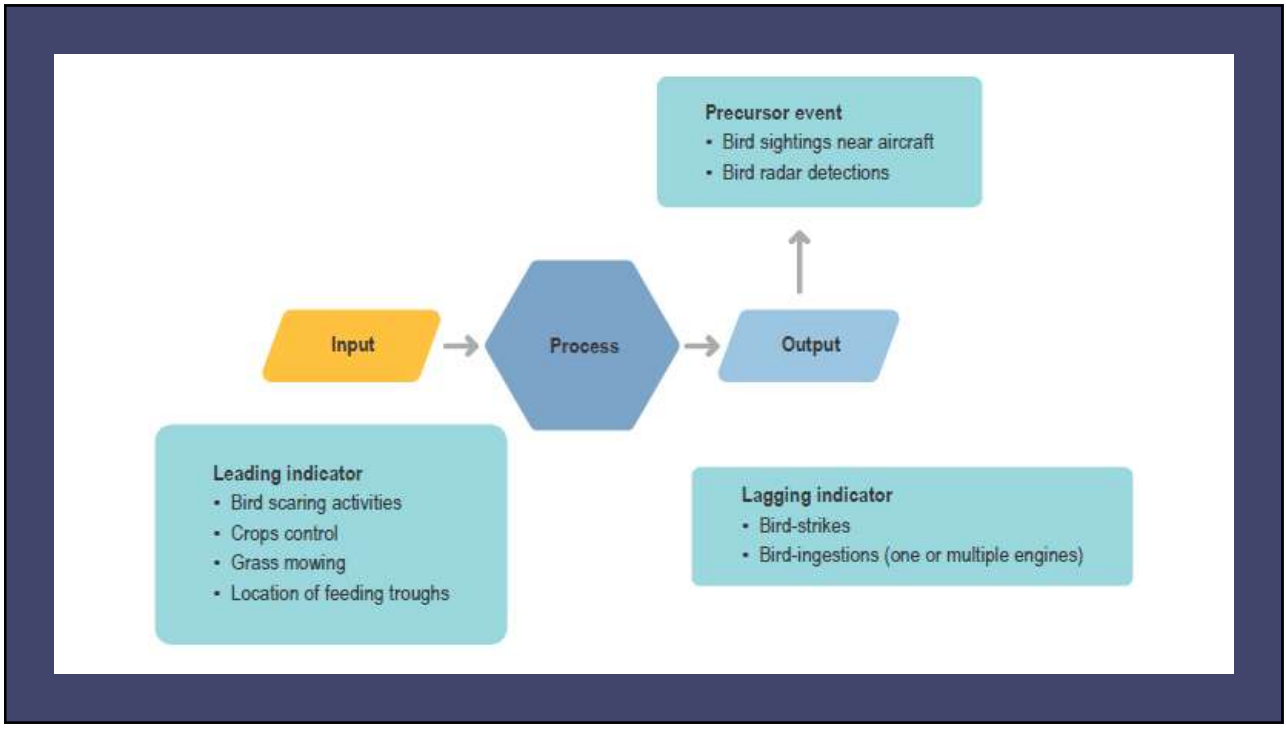
Low probability/High severity
- Accidents
- Serious incidents
- Major injuries

Region, sector or industry level
One-off

High probability/Low severity
- Minor incidents
- Near misses
- Precursor events

Operator, fleet or dept level
Indicative of trend


Accident incident
Deviation degraded condition
Normal condition
Lagging indicators
Number of runway excursions/1000 landings
Precursor events
Number of unstabilized (or non-compliance) approaches /1000 landings
Leading indicators
Percentage of pilots who have received training in stabilized approach procedures


Precursor event
• Bird sightings near aircraft
• Bird radar detections
Input
Process
Output
Leading indicator
• Bird scaring activities
• Crops control
• Grass mowing
• Location of feeding troughs
Lagging indicator
• Bird-strikes
• Bird-ingestions (one or multiple engines)

SPIs should be:

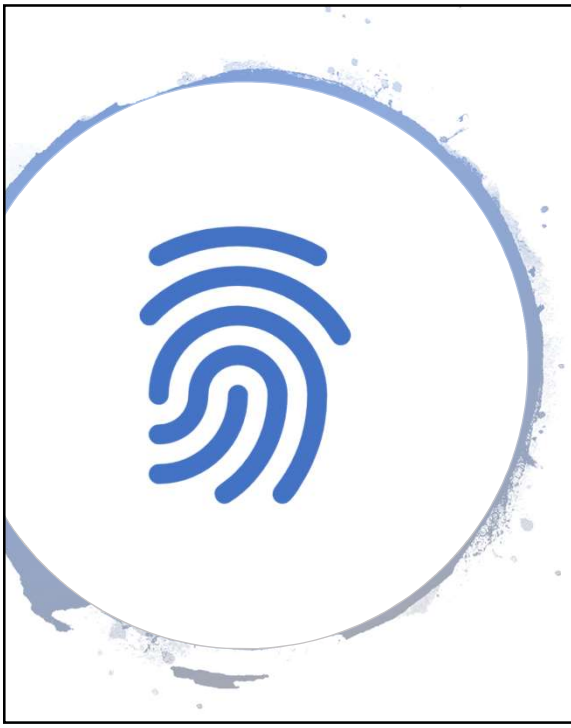
a) related to the **safety objective** they aim to indicate;
b) selected based on **available data** and reliable measurement;
c) appropriately **specific** and quantifiable; and
d) **realistic**, by taking into account the constraints of the organization

Safety Performance Indicators

List some parameters in your airline which could be used as SPIs – are they leading or lagging?

SPI Considerations

1. Workload management
2. Availability/reliability of data
3. Spread of indication
4. Clarity
5. Consistency of data
6. Encourage desired behaviour
7. Value
8. Achieving objectives



Defining SPIs

1. Describe **what** the SPI measures;
2. State the **purpose** of the SPI;
3. Define the **units** of measurement;
4. Assign **responsibility**;
5. Identify the **data source**; and
6. Define the **frequency** of collection/recording.

Safety Performance Indicators

For each of your SPQs devise a leading and a lagging indicator

Safety Performance Targets (SPTs)

TARGET = GOAL = OBJECTIVE

∴

S.M.A.R.T.

Safety Performance Questions

Objective: **Zero harm to people, property and the environment**

SPQ: ***Has anyone been injured during the period?***

SPQ: ***Were there any equipment damage reports in the period?***

SPQ: ***What impact have operations had on the environment in the period?***

Safety Performance

Objective: ***Reduce*** **harm to people, property and the environment**

SPQ: ***Has anyone been injured during the period?***

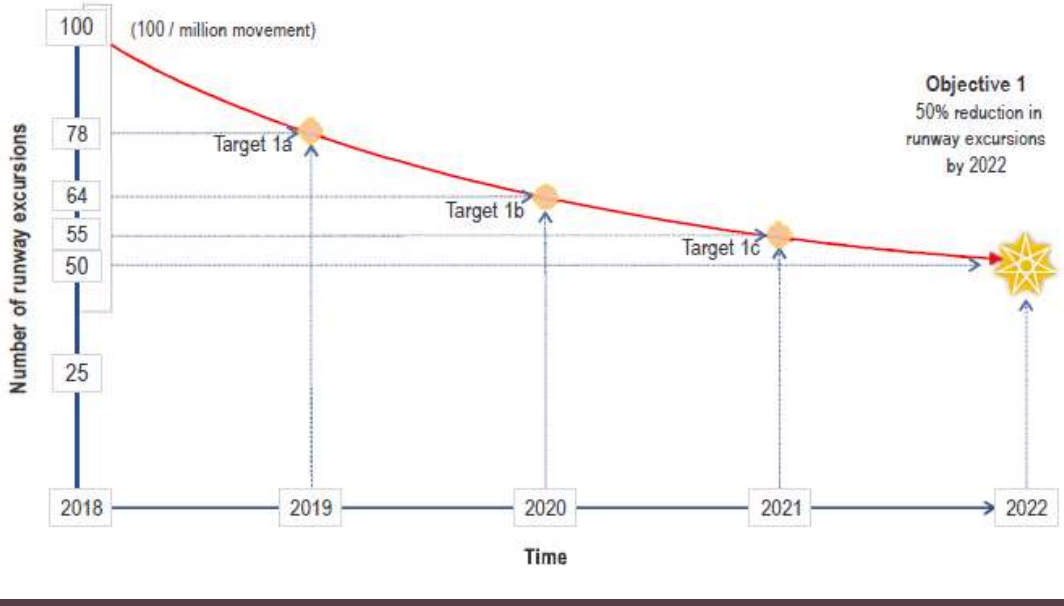
SPI: Number of reported injuries

SPT: Zero injuries

SPQ: ***Were there any equipment damage reports in the period?***

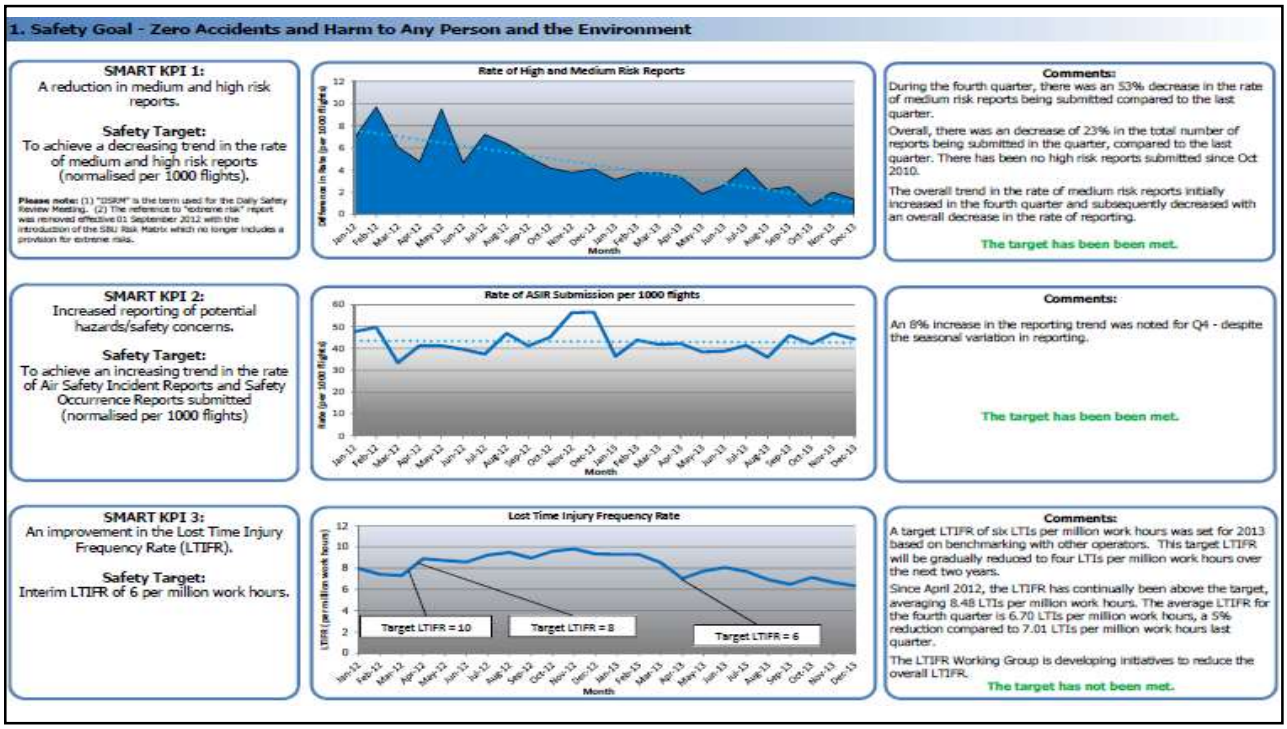
SPI: Number of damage events

SPT: A decreasing trend in damage

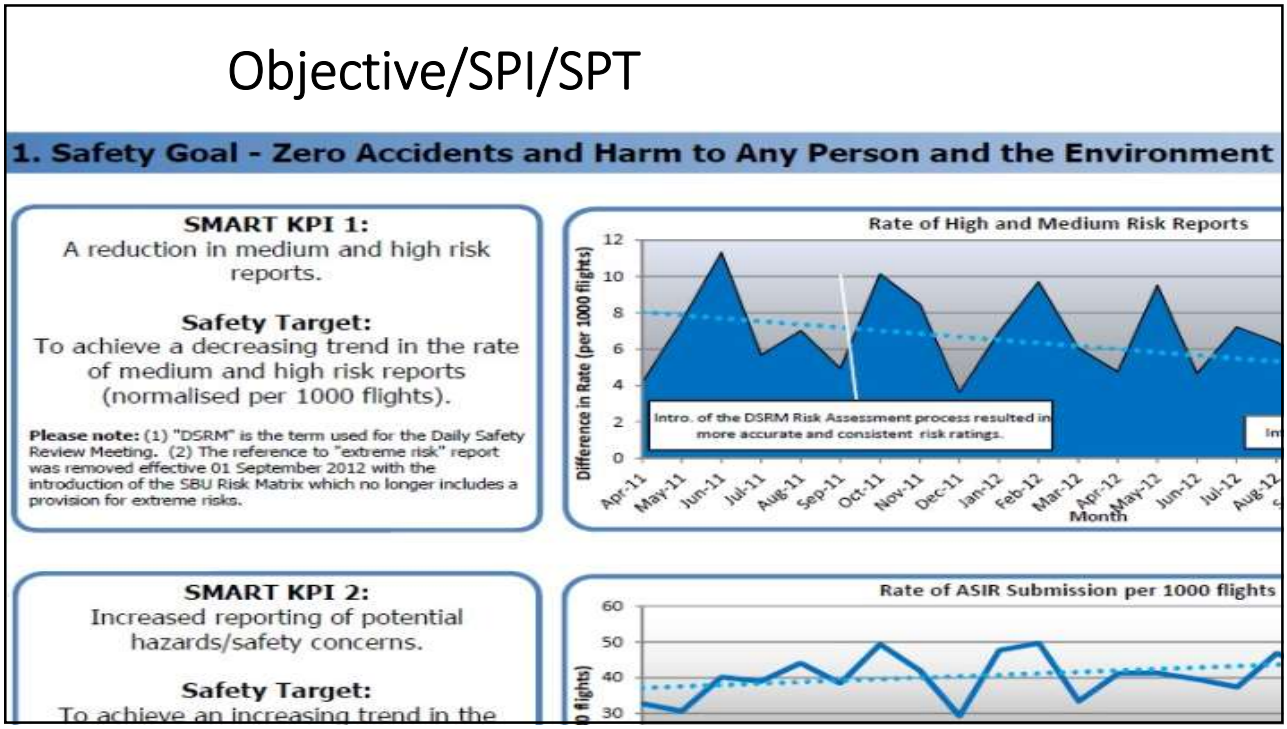


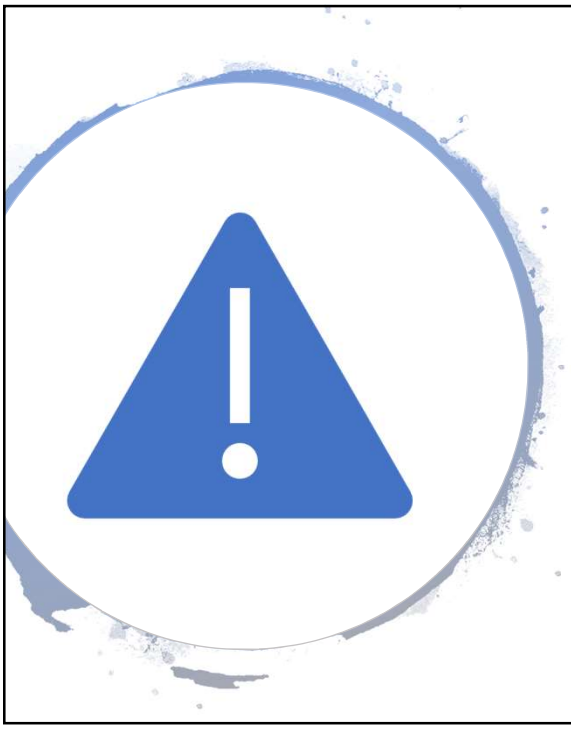
Safety Performance Targets

For each of your Objectives/SPIs devise SMART SPTs



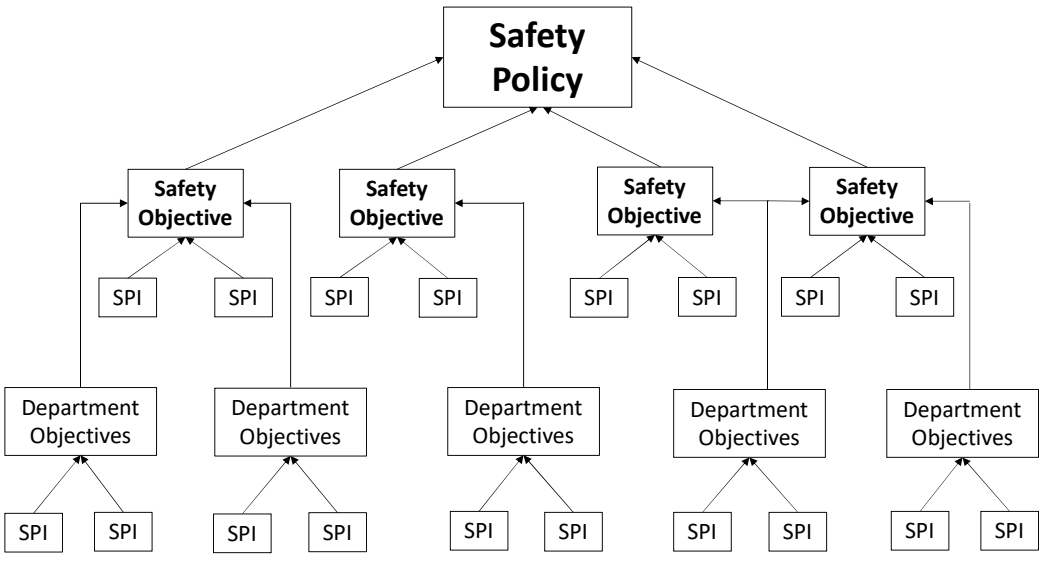
Objective/SPI/SPT

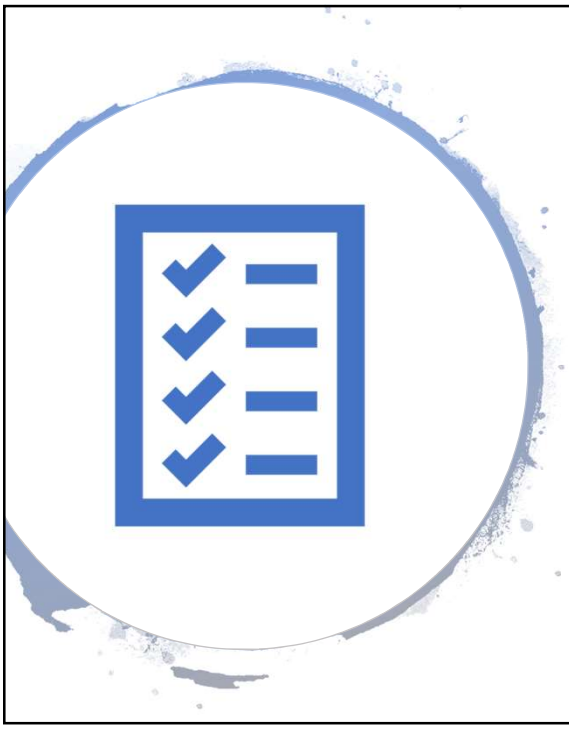




SPT Considerations

- Driving undesirable behaviour
- Focus on quantity not quality
- Conflict with operational targets
- Limit safety performance improvement
- Risk transfer





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