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Safety Performance Indicators (SPI) Safety Performance Targets (SPT) and Measuring Criteria

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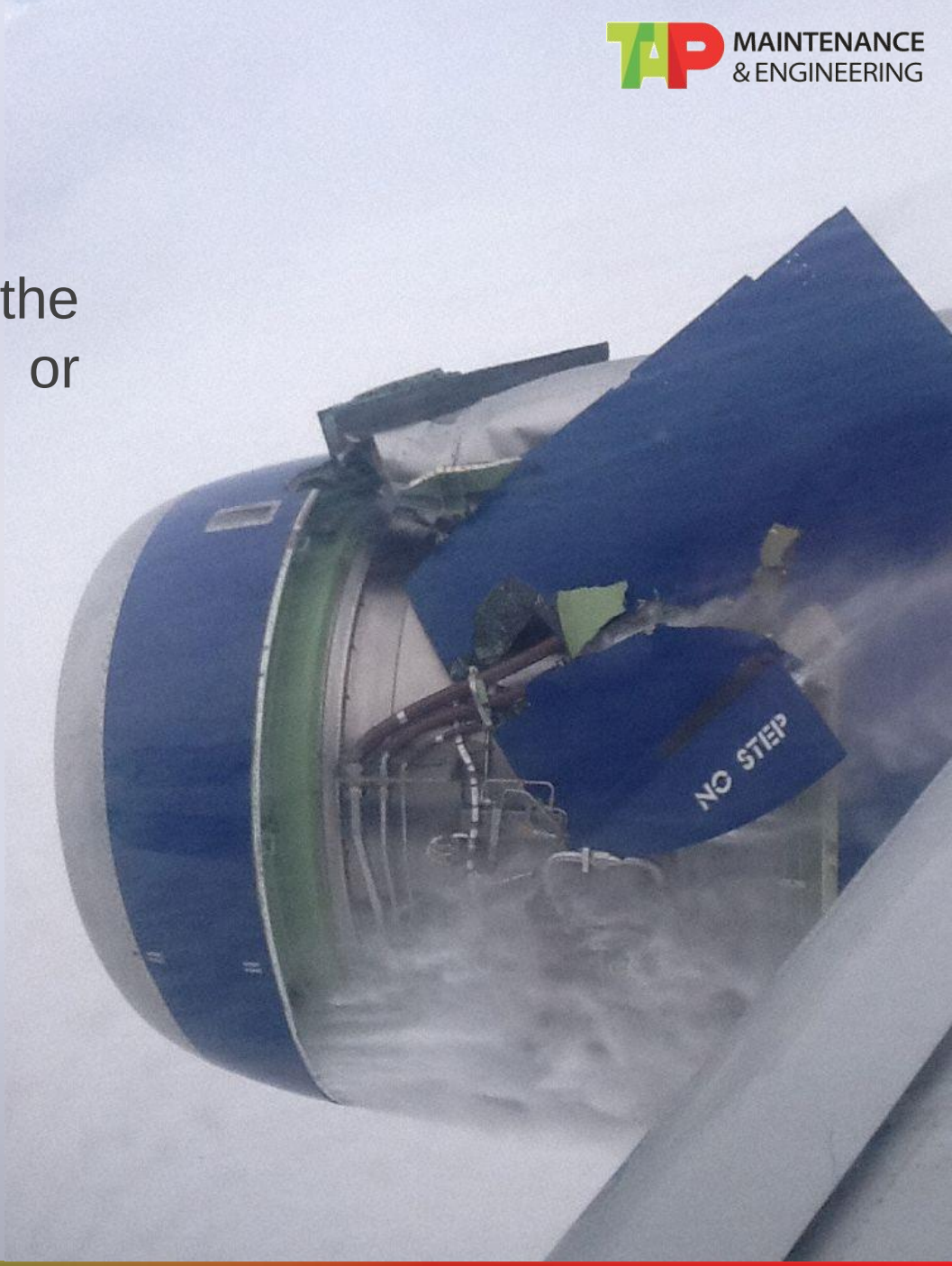
TAP MAINTENANCE & ENGINEERING

It’s great to have reliable Indicators when we are concerned about Safety

Safety Management System

1. What is most likely to be the cause of your next accident or serious incident ?
2. How do you know that ?
3. What are you doing about it ?
4. Is it working ?



Safety Risk Management

- The SMS is supposed to do one simple thing:

…to allocate resources against risk

Safety Performance Indicators

1. We need to manage Safety, *but…*
2. …we cannot manage what we cannot measure, *so…*
3. …we need indicators to measure the system's performance.

The need for SPIs

ICAO Annex 19 – Safety Management

Appendix 2. Framework for a Safety Management System (SMS)

3. Safety assurance

3.1 Safety performance monitoring and measurement

3.1.1 The service provider shall develop and maintain the means to verify the safety performance of the organization and to validate the effectiveness of safety risk controls.

3.1.2 The service provider's safety performance shall be verified in reference to the safety performance indicators and safety performance targets of the SMS.

Definitions

ICAO Annex 19 – Safety Management

Chapter 1. Definitions

Safety performance	safety achievement as defined by the safety performance targets and safety performance indicators
Safety performance indicator	data-based parameter used for monitoring and assessing safety performance
Safety performance target	planned or intended objective for safety performance indicator(s) over a given period

Deming Cycle

Hazard Identification

Risk Management

SPIs

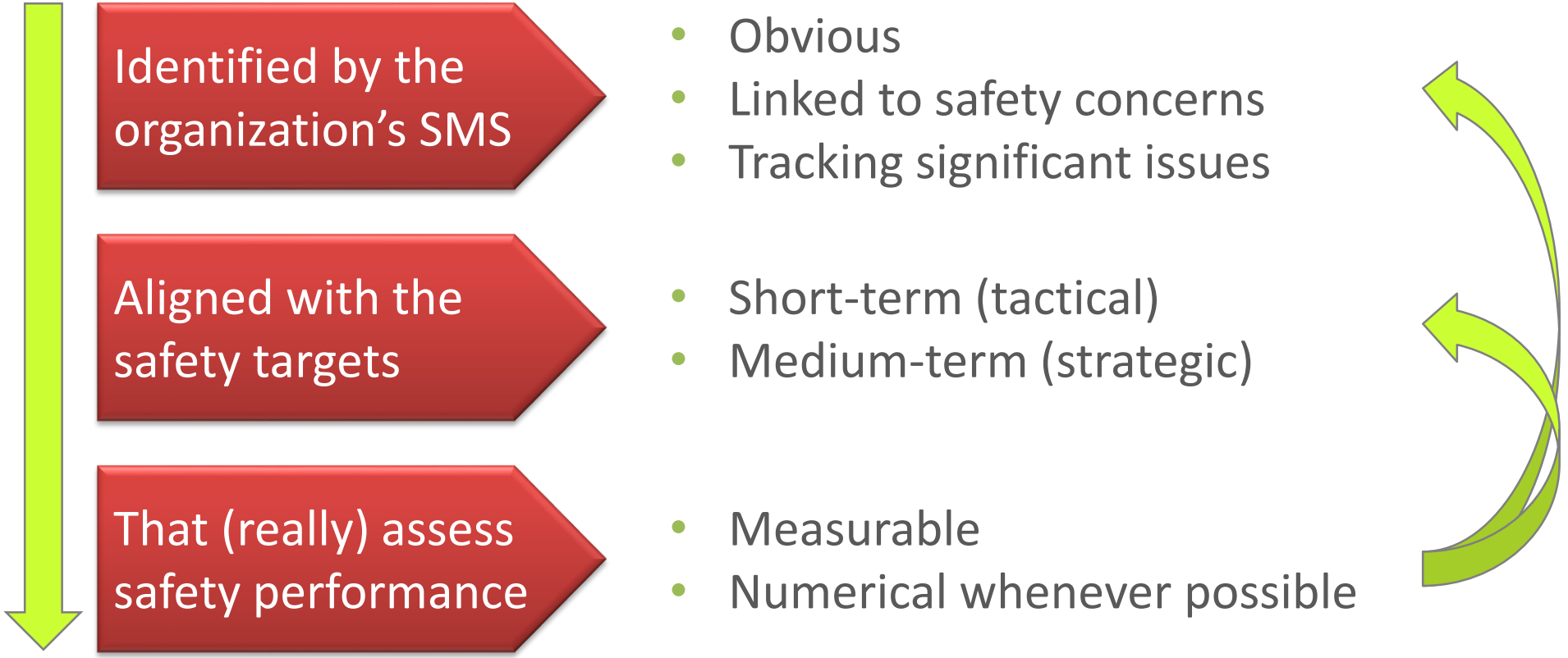
Safety Improvement

Safety Performance

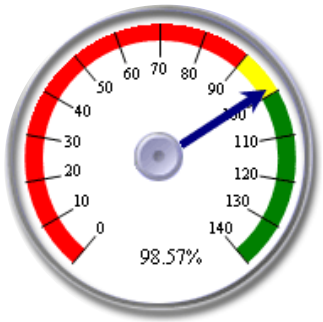
SPTs

Choosing an SPI

SPIs are data-based parameters that measure certain characteristics about occurrences, events, incidents, accidents, etc.



Validating a useful SPI



- **Valid** — It measures what we want to measure, well correlated
- **Reliable** — It is not dependent on conditions, situations, individuals
- **Sensitive** — It is responsive to changes, statistically significant, short timed
- **Representative** — It covers all aspects that are relevant
- **Resistant to bias** — It is not possible to manipulate
- **Cost-effective** — It costs not more than it gives back

Types of SPI

SPIs used at TAP M&E are classified in the following 3 categories, depending on their tactical vs. strategic scope:

Organizational SPIs

- Monitor safety objectives and safety targets
- Monitor risk level
- Control impact on sustainability, competitiveness and image
- Control impact on ratings and insurance costs
- Assess contingency preparedness and MoC
- Control suppliers and providers

Types of SPI (cont.)

SSP-connected SPIs

- Assure compliance
- Satisfy State safety goals
- Meet public expectations and EU vision

Customer related SPIs

- Assure contractual safety compliance
- Satisfy customer's safety goals
- Enable continuous contract monitoring
- Provide competitive edge and differentiation

Launching an SPI

In relation to each SPI chosen, the following check-list should be answered when launching an SPI:

1. Which risk control is weaker and needs to be reinforced?
2. What is the specific issue? What does that weakness relate to?
3. What is the most appropriate metric for the SPI?
4. How will data be collected and who will do it?
5. How will the results be monitored and the corrective actions identified ?
6. What target should we aim for?
7. What alert level should we set up?

Sources of data for SPIs

Reactive

analysis of past events and outcomes

- ASR, VOR, MOR, SAFA
- Hazard identification
- Incident and accident reports
- Safety investigations

Proactive

analysis of present and real-time events

- ASR, VOR
- Surveys, audits
- Compliance monitoring
- Improvement plans

Predictive

forecast future events or outcomes

- FDM, reliability analysis
- Processes monitoring
- Trend following
- Statitistical analysis

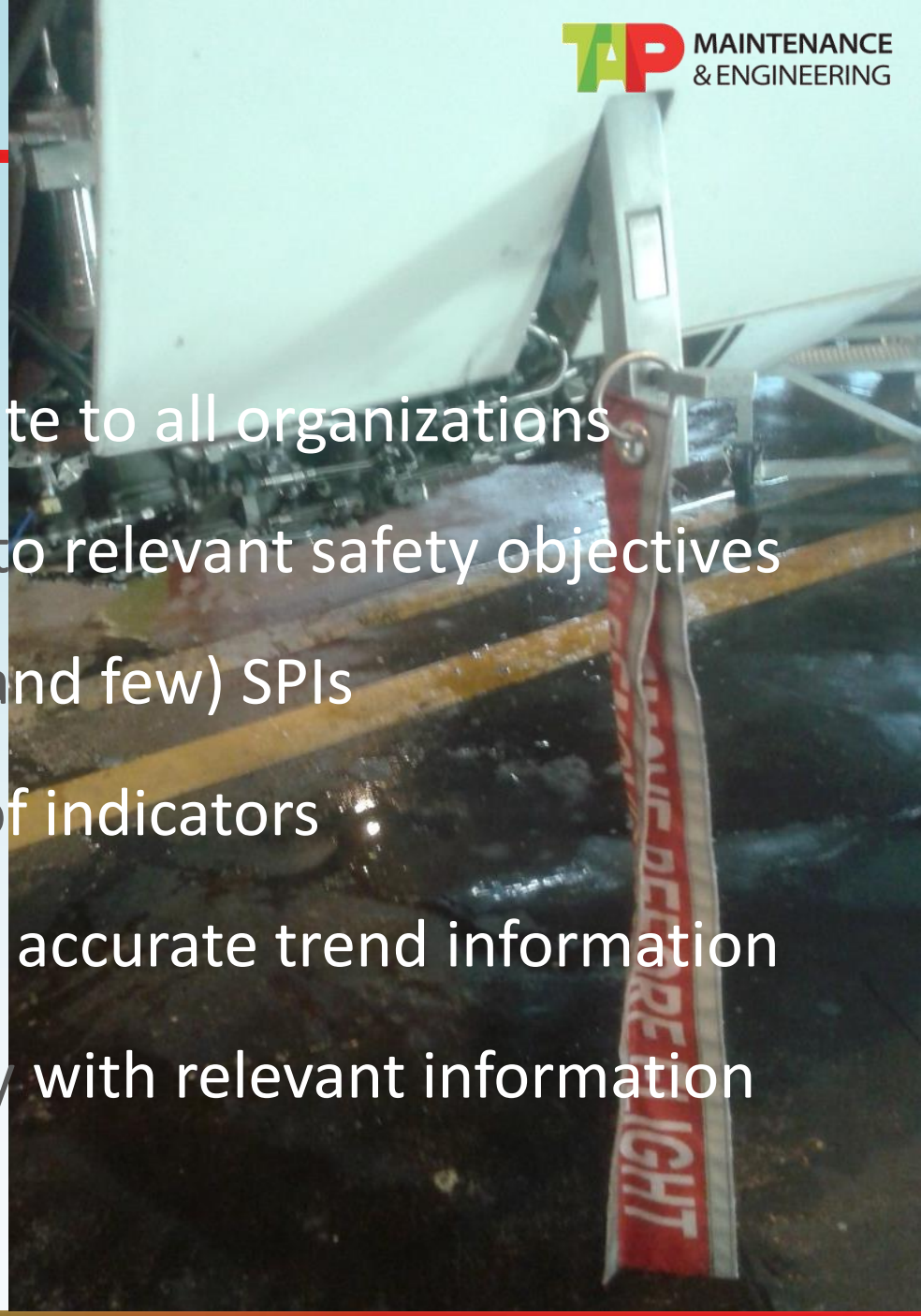
Example SPIs: Part M (CAMO)

Nr.	ID	Category	SPI				
			Name	Description	Acceptable (target)	Tolerable (alert level)	Not Acceptable
1	ACC	Operational	Accidents	Accidents due to maintenance, p/Y	0	>0	1
2	TIR	Operational	TIR	Technical Incident Reports, p/10^6 FH, Curr	<1	1-2	>2
3	ISD	Operational	IFSD	Engine Inflight Shutdowns, p/10^4 FC, Curr	<1	1-2	>2
4	MEL	Operational	MEL Extensions	Requested extensions for MEL items, p/Y	<10	10-13	>13
5	ADI	Operational	AD Irregularities	Airworthiness Directives irregularities, p/Y	<1	1-2	>2
6	RSK	Operational	Risk Level	Average risk level determined for all occurrences, Curr	Low	Minimal	>Minimal
7	UER	Maintenance	Engine Removals	Unscheduled Engine Removals, p/Y	<2	2	>2
8	CON	Maintenance	Convenience Removals	Component removals for convenience, p/Q	<80	80-100	>100
9	EEF	Maintenance	Emergency Equipment Failures	Failures in emergency equipment during programmed tests, p/Q	<2%	2%-5%	>5%
10	VOR	Operational	Voluntary Reports	Voluntary Occurrence Reports, p/Y	>80	60-80	<60

Example SPIs: Part 145 (MRO)

Nr.	ID	Category	SPI				
			Name	Description	Acceptable (target)	Tolerable (alert level)	Not Acceptable
1	ACC	Operational	Accidents	Accidents due to maintenance activity, p/Y	0	>0	1
2	SNG	Operational	Snags	Operational snags due to maintenance activity, p/M	<10	10-15	>15
3	RSK	Maintenance	Risk Level	Average risk level determined for all occurrences, Curr	Low and Minimal	Moderate	High and Very High
4	VOR	Maintenance	Voluntary Reports	Voluntary Occurrence Reports, p/Y	>500	400-500	<400
5	UID	Maintenance	Unintended Damages	Unintended damages during maintenance actions, p/Q	<5	5-7	>7
6	EEF	Operational	Emergency Equipment Failures	Failures in emergency equipment after maintenance, p/Q	<5%	5%-10%	>10%
7	CAN	Logistics	Canibalizations	Number of canibalizations, p/Q	<200	200-250	>250
8	CLD	Reputational	Claims/Disputes	Claims and disputes with customers due to safety issues, p/S	<2	2-3	>3
9	SUP	Logistics	Suppliers	Claims and disputes with suppliers due to safety issues, p/Q	<5	5-8	>8

Hard facts about SPIs



- There is no single SPI apropriate to all organizations
- Chosen SPIs should correlate to relevant safety objectives
- It is difficult to choose good (and few) SPIs
- It’s easy to end up with a lot of indicators
- In reality, they may fail to give accurate trend information
- Registered in the safety library with relevant information

Thank you !

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