Safety Performance Monitoring and Measurement

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Safety Performance Management

- Provides an organization with the means to determine whether its activities and processes are working effectively to achieve its safety objectives (ICAO)

Is Your Organization Safe?

- Good question!
- First, you need to define “safe”-
  - ALoS-
    - *Acceptable level of safety*
  - ALARP-
    - Reduce risks to *as low as reasonably practicable*
- But how do we measure safety-
  - We’ve never had an accident?
  - Employees usually follow the rules and procedures?
  - The CEO says we’re a safe company?
- There’s a much better way!

A More Pragmatic Approach

Safety Goal
"To be the safest airline in the USA"

Safety Objectives

What are we looking to do?

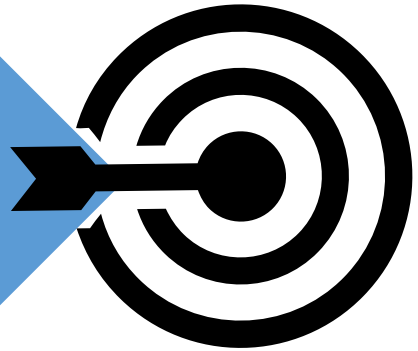
Example:
Reduce FOD-related damage

Safety Indicators

How do we measure it?

Example:
Number of FOD incident reports/month

Safety Targets



Are we meeting our objectives?

Example:
Reduce FOD incidents by 10% over the next three months

Safety Goal

- “To be the safest airline in the USA”-
  - A very broad safety goal set by the organization
  - An ongoing process
- Is this goal achievable?-
  - Depends on how you define “safest”
  - Regardless, you need to quantify your broad safety goal using various safety objectives…

Safety Objectives

- Statements that define what you are looking to accomplish in your safety processes-
  - “Reduce FOD-related damage”
  - “Increase intake of voluntary safety reports”
  - “Reduce flightcrew fatigue”
- Safety objectives are used to develop specific Safety Indicators-
  - Also referred to as Safety Performance Indicators (SPIs)

Safety Indicator Development Process

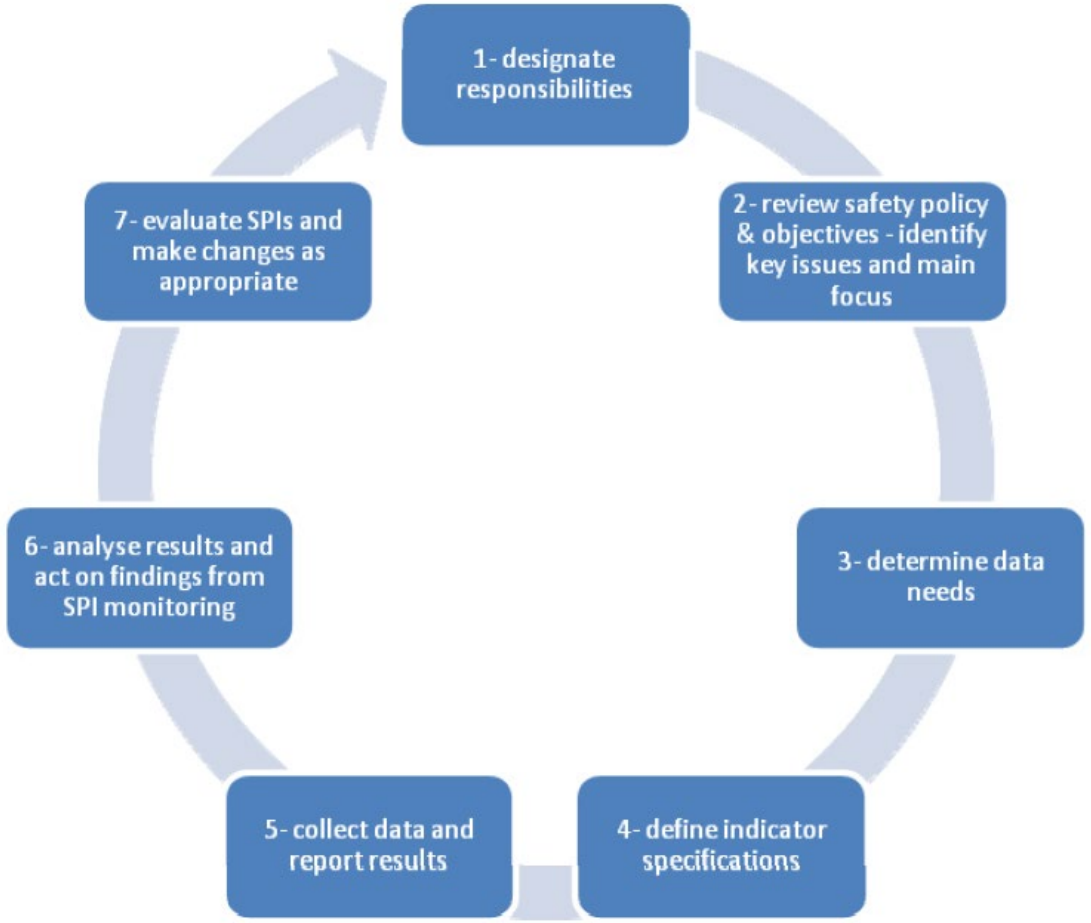


Figure 3: Process steps

Source: SM ICG/Skybrary

Safety Indicator Examples

Organization/Safety Culture

- Number of safety reports received
- Number of safety newsletters
- Number of management walk-arounds

Flight Operations

- Number of unstable approaches

Maintenance

- Number of MEL items
- % of work orders with a difference > 10% between the expected lead time and the actual processing time

Emergency Response Planning

- Number of emergency drills

Add measurement time period to each SI
e.g., month/year/quarter

Lagging/Leading Indicators

- Lagging Indicators (reactive)-
  - Events that have already happened
- Leading Indicators (proactive/predictive)-
  - Events that may happen in the future

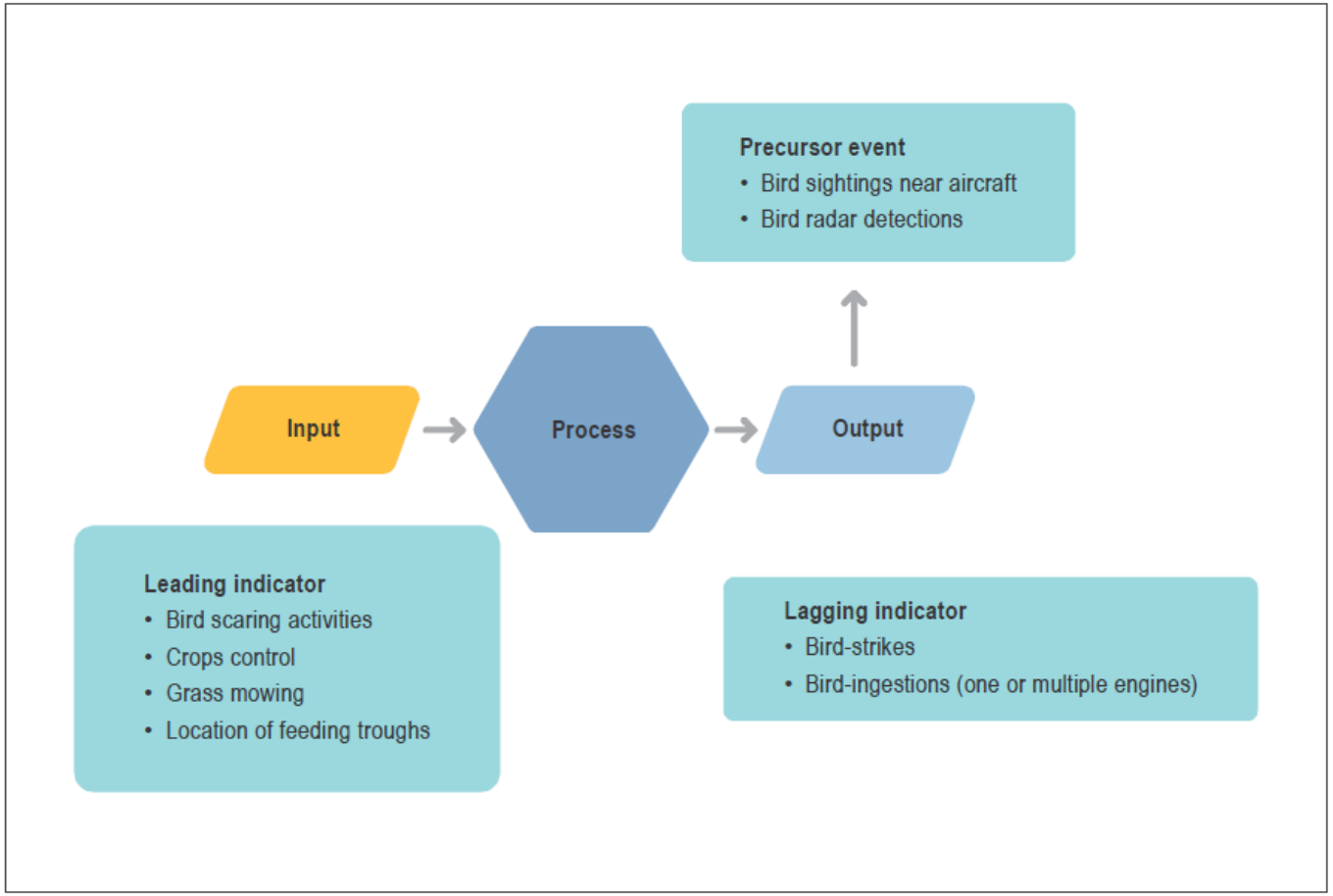
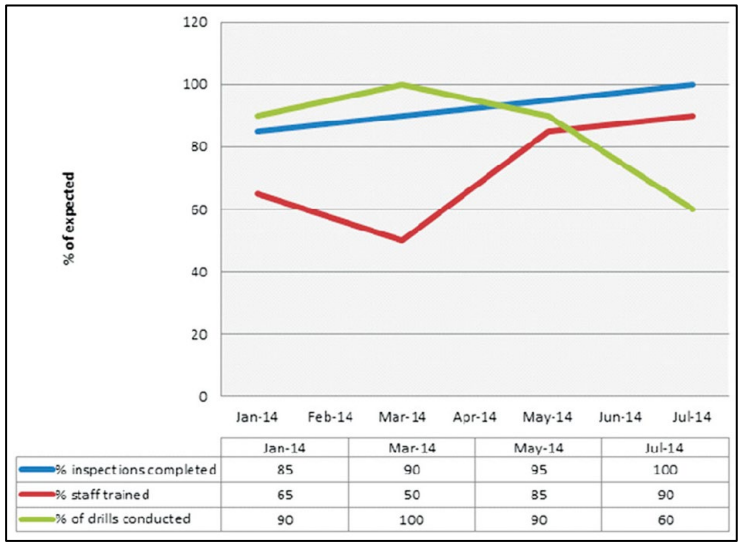


Figure 4-2. Leading vs Lagging indicator concept phases

Source: ICAO Doc. 9859

Quantitative/Qualitative Indicators

- Quantitative Indicators-
  - Most indicators are quantitative
  - Easier for comparisons and detecting trends
  - Objective



	Jan-14	Mar-14	May-14	Jul-14
% inspections completed	85	90	95	100
% staff trained	65	50	85	90
% of drills conducted	90	100	90	60

- Qualitative Indicators-
  - Useful for measuring attitudes, beliefs, opinions
  - Methods include interviews, observations, focus groups, and survey narratives
  - Subjective (be careful)

I have difficulty speaking up to my manager

- They are somewhat unapproachable and your opinion is of no value
- I just avoid him because I know what the outcome will be
- I tell them as it is

Safety Targets

- Now we can set our safety targets-
  - What are we trying to accomplish and how long will it take?
  - Be specific (increases/decreases in percentages/rates)
  - Be **realistic-**
    - To achieve ALoS
    - Don't be a "zero hero" or a "dreamer"-
      - **The Zero Hero-** "*Zero flight delays for the next 12 months*"
      - **The Dreamer-** "*50 voluntary safety reports, per employee, per month*"
    - Change takes time
    - Slow but steady progress to "move the needle"

Safety Target Examples

Performance Indicator	Objectives	Performance											
		1	2	3	4	5	6	7	8	9	10	11	12
		Qtr1			Qtr2			Qtr3			Qtr4		
Number of major risk incidents (as defined in SMM)	1 or less												
Number of MORs	3 or less												
Number of internal audits	4												
Number of audit findings per audit	2 or less												
Number of safety committee meetings	6												
Safety committee attendance of key personnel	Minimum 80%												
Number of ERP drills	1												
Number of hazard / safety reports	20 or more												
Number of safety newsletters issued	2												
Number of formal risk assessments	5 or more												
Number of safety surveys	1												
Number of airworthiness incidents (as defined in SMM)*	1												
Number of flights flown with operational MEL restrictions *	3 or less												

Normalizing Data

- Compensates for variation
- Helpful with global stats comparisons
- If we're measuring runway incursions, for instance, there could be a variation in the number of departures during the monitored period
- Normalizing by "rate" gives us a more accurate picture-
  - Divide the number of runway incursions by the number of movements and then multiply the result x 100,000
  - The result is the number of runway incursions per 100,000 departures
  - (1,000) or (10,000) can also be used to normalize different types of data

Hypothetical Example

- Runway incursions for the month of March: 2
- Total number of operations for March: 16,000

  2 divided by 16,000 = 0.000125 x 100,000

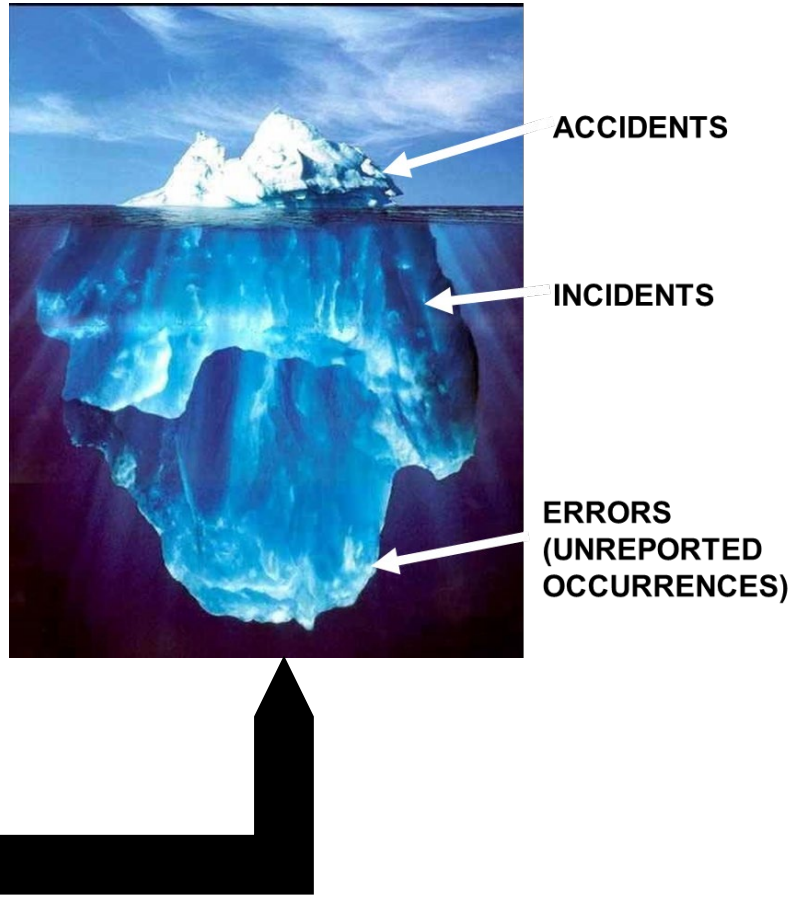
  The runway incursion rate is 12.5 per 100,000 operations

Next Steps

- Safety Performance Monitoring and Measurement is an ongoing, living process-
  - Collect data and report results
  - Analyze the results and act on findings from SPIs-
    - To correct things that have failed (reactive)
    - To address current issues (proactive)
    - To prevent bad things from happening in the future (predictive)
  - Evaluate SPIs and make changes as appropriate (new SPIs may need to be added; some SPIs may no longer be relevant or needed)

Next Steps

- Safety Promotion-
  - There must be a high level of safety promotion
  - It takes everyone, at all levels, to meet your safety objectives (the Safety Manager cannot do it alone)
  - This includes continuously promoting the organization's voluntary hazard/safety reporting system
  - Employees are a very important source of safety data
  - You can't measure something if you don't know it exists!



Next Steps

- Safety Communication-
  - Safety newsletters, emails, meetings, etc.
  - Feedback and results of SPI data to management and employees on a regular basis
  - Encourage staff to participate in surveys, interviews, focus groups, etc.
  - See something…say something
  - Stress the need for continuous improvement
  - Safety isn't a destination…it's an ongoing journey!

Important Note!

- Regulators are now using a mix of both prescriptive and performance-based oversight. PBO focuses on-
  - The performance of a system
  - The systems and processes for risk management
  - The Operators' unique risks and risk management controls
  - The effectiveness of the Operator's SMS and an assessment of the maturity of the Operator's SMS

PBO audits are heavily dependent on your safety performance monitoring and measurement data!

Thank You!

Let us know if we can assist with your SMS!

We can work with you, VIRTUALLY!