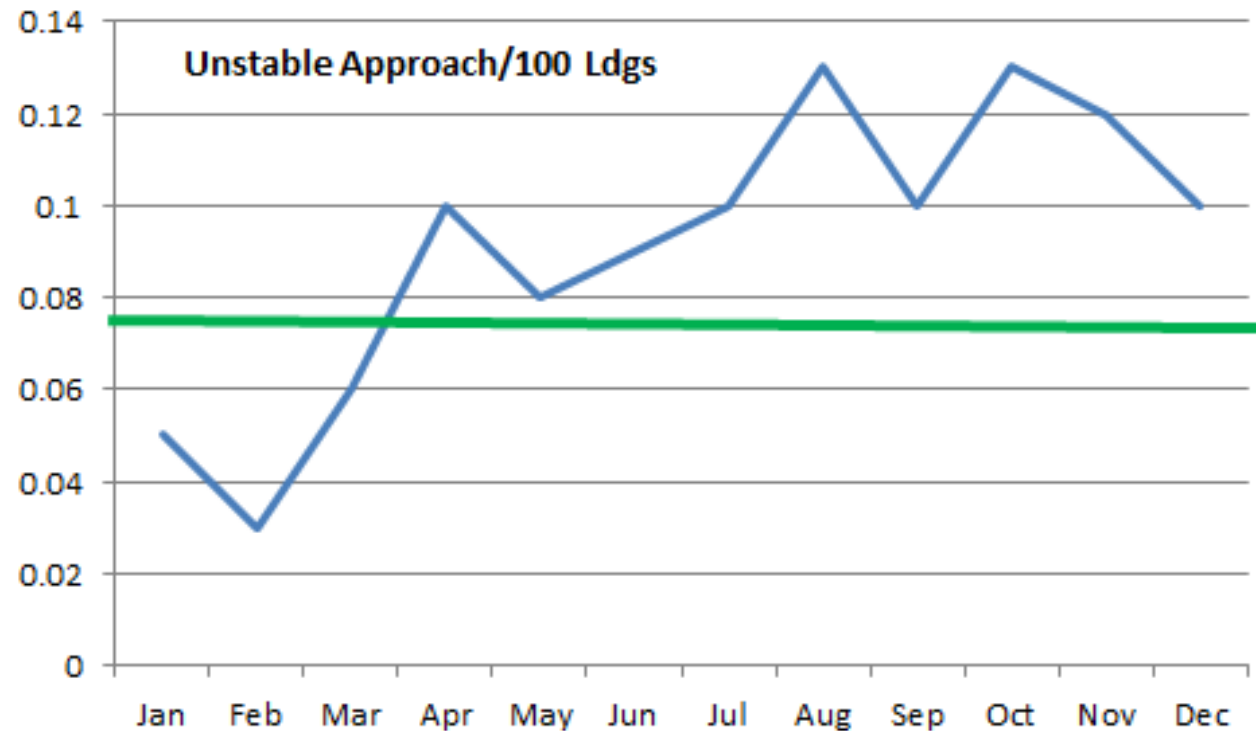# Measuring Safety Performance

International Business Aviation Council

Safety Performance Indicator

▸ A <u>data–based safety parameter</u> used for monitoring and assessing safety performance.

Ref: ICAO Doc 9859

Measure What Matters Most

- Safety Performance Indicators (SPI's)
  - Reduce complexity to a small number of key indicators
- This is the same approach we use in our personal health
  - Blood pressure, Cholesterol levels, Heart rate
- Most Aviation Accidents are caused by human error
  - Suggestion: Measure factors related to human error

SPI TRAP

- **AVOID THIS TRAP!!**
  - Identify everything that is easy to measure and count
  - Report the data on everything easy to measure and count
  - End up confused and overwhelmed with data
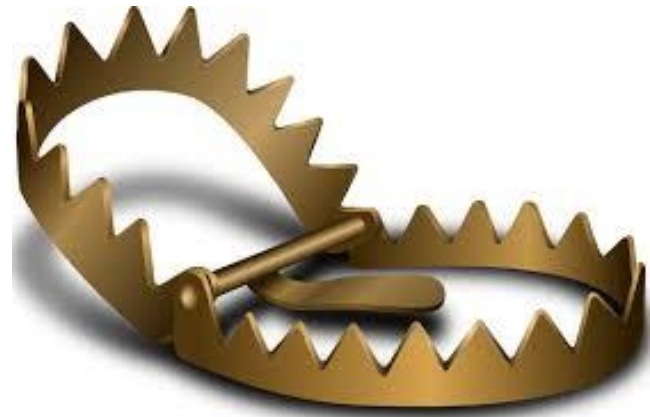
SPI's to Consider

- How often are these happening and why?

  ◦ Unstable Approaches

  ◦ Procedural Errors or Lapses

  ◦ Working Fatigued

  ◦ Minimum Fuel Events

  ◦ TCAS RA Events

  ◦ EGPWS or TAWS Alerts/Warnings

  ◦ Events related to LOCI, for example:

    • Low speed/stall alert or warning

    • Bank Angle alert or warning

How To Capture Data

- Flight Data Analysis Programs

- Supervisor Observations – LOSA & Maintenance

- Daily Debriefs capturing errors and deviations from SOPs
  ◦ Use online survey– it's easy

- Voluntary Reporting

Safety Performance Target

▸ The planned or intended objective for safety performance indicator(s) over a given period.

- Technique

  - Gather data over a one year period

  - Compute Average

  - Set a reasonable Goal (Target) to improve

Ref: ICAO Doc 9859

Hi-Consequence Indicators

- SPIs pertaining to the monitoring and measurement of high-consequence occurrences, such as accidents or serious incidents.

- High-consequence indicators are sometimes referred to as <u>reactive indicators</u>.

Ref: ICAO Doc 9859

Low-Consequence Indicators

- SPIs pertaining to the monitoring and measurement of lower-consequence occurrences, events or activities such as <u>incidents, non-conformance findings or deviations</u>.

- Lower-consequence indicators are sometimes referred to as <u>proactive/predictive indicators</u>.

Ref: ICAO Doc 9859

Scope of the SMS

▸ SMS addresses the aviation activities of an aviation service provider that are <u>related to the safe operation of aircraft</u>.

▸ This includes:

◦ Flight Ops

◦ Mx

◦ Dispatching

Ref: ICAO Doc 9859

SPI Alert and Target Values

▸ Safety performance is expressed by SPIs and their corresponding alert and target values.

▸ Monitor the performance of SPI trends to identify any abnormal changes in safety performance

▸ Target and alert settings should take into consideration recent historical performance for a given indicator

▸ Targets should be realistic and achievable

Ref: ICAO Doc 9859

Past Performance

▸ Past performance may be an indicator of future performance

▸ Employ trend analyses to track safety performance over time

▸ Where deficiencies have been found and corrected ensure the effectiveness of corrective actions.
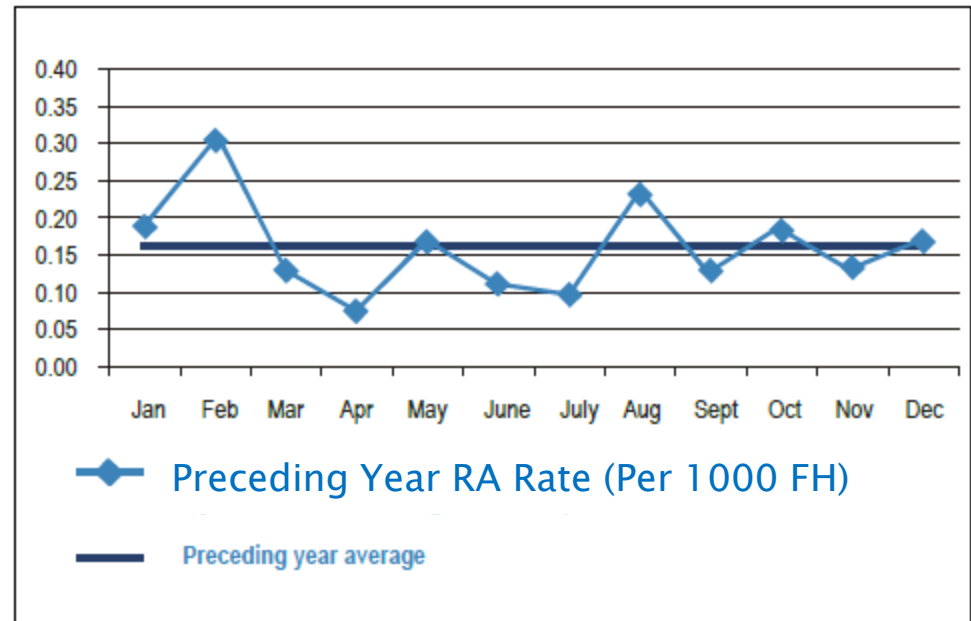
Ref: ICAO Doc 9859

SPI and Performance Monitoring

- Normally depicted in the form of charts or graphs
- Target Example: 5% Better than Last Year Average
- Alerts related to Data Points (DP) & Standard Deviations (SD)
- ALERT:
  - 1 DP > 3 SD
  - 2 DP > 2 SD
  - 3 DP > 1 SD

Ref: ICAO Doc 9859

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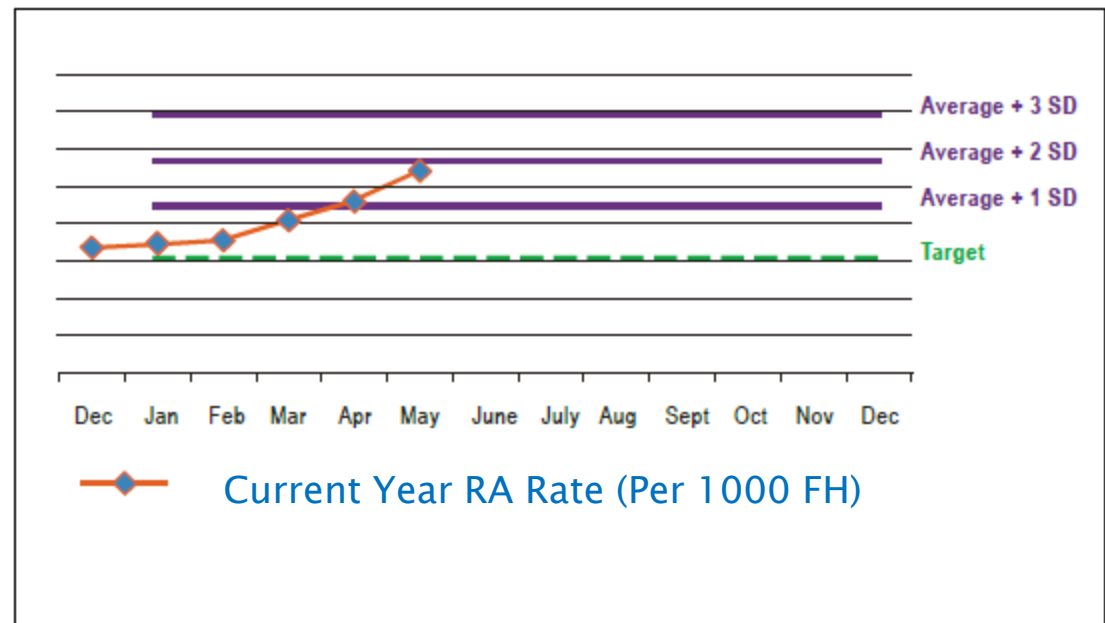
Performance Summaries

- Once SPIs and corresponding targets and alert settings have been defined, the performance outcome of each indicator should be updated and monitored on a regular basis.

- A summary of the overall target and alert performance outcome of the complete safety performance indicators package may be aggregated for a given monitoring period.

SPI	Target	Actual
RA Warning	2.5/100 TO	3.5/100 TO
Unstable Approach	4.5/100 Ldgs	4.1/100 Ldgs
EGPWS Warning	1/100 TO	2/100 TO
Missed Checklist Item	8/100 TO	7/100 TO
Minimum Fuel Situation	.5/100 TO	.67/100 TO
Extended Duty Day	2/100 TO	1.3/100 TO

Ref: ICAO Doc 9859

How to Use SPI Results

▸ SPIs are NOT simply metrics used to get a better score

▸ SPIs are to be utilized to improve safety performance

▸ Results include collection, analysis, and interpretation of SPIs

▸ It is important that these results are used by management for decision and action.

▸ These results should be presented at regular meetings and communicated to everyone in the organization

▸ Actions should not focus on certain indicators in isolation, but on optimizing your organization's overall safety performance.

Evaluate SPIs

▸ Periodically review and evaluate your SPIs to consider:

  ◦ the value of experience gained,

  ◦ new safety issues identified,

  ◦ changes in the nature of risk,

  ◦ changes in the safety policy, objectives; and priorities,

  ◦ changes in applicable regulations, and

  ◦ organizational changes, etc.

Summary

- Measuring Safety Performance
  - SPI's must be meaningful
  - SPI's must relate to the safe operation of aircraft
    - Flight Operations
    - Maintenance
    - Dispatch