Measuring Safety Performance

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Safety Performance Measurement (SPM): SPI & ALoSP Development

Agenda
Å Definition.
Å Why measure safety performance?
Å Alert Level Setting.
Å Alert Level Trigger.
Å Target Level Setting (planned improvement).
Å Target Achievement.
Å Acceptable Level of Safety performance (ALoSP).

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Safety Performance Indicator

- **Safety Performance Indicator**: A data-based safety parameter used for monitoring and assessing safety performance.

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**Graph:**
- **ALL OPERATOR-REPORTED INCIDENTS/ACCIDENTS**
- **Preceding Year Combined Operators Monthly Reportable Incident rate (per 1000FH)**
- **Preceding Year Average (Ave)**

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Safety Performance Indicator

- **Alert Level:** An alert level is a common criterion to delineate the acceptable from the unacceptable performance regions for a particular safety indicator.

- **Target Level:** The required level of safety performance of a system, during aviation activities that are centred around the set organisational safety objective.
Safety Performance Indicator

- **Acceptable Level of Safety Performance (ALoSP):** The minimum level of safety performance of civil aviation in a State, as defined in its State Safety Programme, or of a service provider, as defined in its safety management system, expressed in terms of safety performance targets and safety performance indicators.
Measure What Matters Most

- Safety Performance Indicators (SPIs)
  - 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.

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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.
SPIs 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.
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.
Hi-Consequence Indicators

- SPIs pertaining to the monitoring and measurement of high-consequence occurrences, such as accidents or serious incidents, i.e. Mandatory Occurrence Reports (MORs).
- High-consequence indicators are sometimes referred to as reactive indicators.
Low-Consequence Indicator

- SPIs pertaining to the monitoring and measurement of lower-consequence occurrences, events or activities such as incidents, non-conformance findings or deviations.
- Lower-consequence indicators are sometimes referred to as proactive/predictive indicators.
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 (SMART).
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.
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

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**Current Year Combined Operators Monthly Reportable Incident rate (per 1000 FH)**

- **Current Year Target Average**
- **Ave+1 SD**
- **Ave+2 SD**
- **Ave+3 SD**

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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.
How to Use SPI Results

- SPIs are NOT simply metrics used to get a better score
- SPIs are to be utilised 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 organisation
- Actions should not focus on certain indicators in isolation, but on optimising your organisation’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
  - organisational changes, etc.
Measuring Safety Performance

- SPI's must be meaningful
- SPI's must relate to the safe operation of aircraft

- Flight Operations
- Maintenance
- Dispatch

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