Practical IEPs and SPIs

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Objective

- Provide information for implementing a practical Internal Evaluation Program
- Provide information for developing sensible SPIs
CEO: So, how are we doing?
You: Just fine.
CEO: How do you know?

*This is the essence Performance Monitoring and why we have IEPs and SPIs*
“Simplicity is the ultimate sophistication.”

— Leonardo da Vinci
Overview

Part I: IEPs

- Requirements
  - External
  - Manuals
  - Procedures
  - Instructions

- Compare

- Evidence
  - Physical
  - The senses
  - Interviews
  - Paperwork
  - The patterns

- Observations

- Findings
  - Problem or Cause/Effect

- Analyze

- Conclusions
  - Executive Summary

Part II: SPIs

- Graph showing data over time with various averages and a trend line.
Part I: IEP Overview

• What is an IEP?
• Why have an IEP?
• Managing an IEP
IEP Origins

- Internal control dates back to when operational complexity required one person to have custody of assets belonging to others (Wilson, Wells, Little, & Ross, 2014, p. 85).

- When the owner of a business jet asks the aviation manager, “how are things going?”, it is reasonable for the owner to expect the manager to be validating the answer, “Just fine!”, with a sensible and systematic approach.
What is an Internal Evaluation?

• An Internal evaluation (IE) is a quality review undertaken within an organization for its own benefit with or without the involvement of an external subject matter expert.

• From an external agency perspective, the internal review is perceived as the part of the process that an organization undergoes to prepare for an external audit (Harvey, 2016).
Why Have an IEP?

- SMS Requirement
  - Safety Assurance
    “No matter how small your organization, an internal audit will assess your processes and procedures and give you a level of confidence that everything is being done properly and your staff members are following your policy and procedures. (SMICG, 2015, p.11)”
Why Quote SMICG?

- ICAO requires all commercial operators and international GA operators of large or turbojet aircraft to implement an SMS.
- FAA requires only Part 121 operators to have an SMS
- FAA offers AC 120-92B for guidance in implementing FAR Part 5
- FAA’s SMS guidance for business aviation is very limited
- International sources for SMS implementation guidance, such as SMICG and IS-BAO, are excellent sources.
Managing an Internal Evaluation

• Typically accomplished by someone within the organization.
  – Advantage of fully understanding the logic behind the processes
  – Auditor appreciates any problems that may have developed
  – People must trust and cooperate with the internal auditor

• Cons
  – Internal auditor may find it challenging to criticize colleagues
  – Might hesitate to suggest innovative solutions to findings
  – May shy away from the idea of suggesting even more work

(Robert Gordon University, 2016)
SMICG on IEP for Small Operators

• Internal auditor should be independent of the audited process
• Internal auditor should record the findings and corrective actions
• Management should capture hazards & risks in the Hazard Log
• Use cross functional teams
• Progressive: Complete a partial internal audit each quarter
SMICG: If it is Too Challenging for Small Operators

- If the aviation manager determines it is too challenging to ensure an independent audit, consider utilizing an external auditor (SMICG, 2015)
Focused IEP

• Ensuring compliance with regulatory compliance is important
  – Pilot training/qualification, Airworthiness, LOAs, etc

• IEP should focus on the effectiveness of safety risk controls

• Killer Item Technique
  – Small operator to ensure resources are used wisely
  – Dassault Falcon philosophy for pilot checklists
    • Each pilot individually completes their flow checklist items
    • Together, ensure the “killer items” are verified complete
Focused IEP on Killer Items

- Applying a “killer item” approach to the internal evaluation
- Focus efforts on working together to analyze potential threats
  - Organizational unique risks (i.e. single pilot, circling approaches)
  - NTSB Most Wanted
    - Fatigue
    - Distraction
    - Procedural Non-Compliance
    - Unfit for duty
Capture Killer Items

- Technique: “Daily Debrief”
- Pilots and maintenance professionals take 5 to 10 minutes at the end of each duty day and truthfully answer 3 basic questions:
  1. Where there any deviations from policies, processes, or procedures (PPP) today?
  2. If yes, which one(s)?
  3. If yes, why?
- Capture info in software tracking system to monitor trends
Capture Latent Conditions and Active Failures

• If PPPs are aligned with best practices, capturing deviations is one of the best starting points for an IEP.

• From the perspective of the organizational accident
  – Monitor processes to identify latent conditions
  – Improve workplace conditions to contain active failures

(ICAO, 2013)
The Organizational Accident (Fig 2-3, ICAO Doc 9859)

- Organizational processes
  - Improve
    - Workplace conditions
      - Contain
        - Active failures
      - Monitor
  - Identify
    - Latent conditions
      - Inadequate defences
      - Reinforce

Accident
Internal Surveys

- Internal surveys related to the “killer items” can provide further insight for management.

- Example, “During the past 90 days, the risks related to “distraction” have been managed effectively in my organization”
  - Strongly Agree
  - Agree
  - Disagree
  - Strongly Disagree
References


Part II: SPI Overview

- What is an SPI?
- Why have SPIs?
- Choosing an SPI
What is an SPI?

- ICAO defines safety performance indicator as “a data-based safety parameter used for monitoring and assessing performance” and safety performance target as “the planned or intended objective for safety performance indicator(s) over a given period.” (SMICG, 2013)
ICAO Annex 19

- ICAO Annex 19, Safety Management, requires organizations to develop safety performance indicators (SPIs) and targets as part of their safety assurance efforts (ICAO, 2013a).
ALoSP

• Acceptable Level of Safety Performance (ALoSP)
  – “the minimum level of safety performance ... as defined in its SMS, expressed in terms of safety performance targets and safety performance indicators” (ICAO, 2013b, p. xii).
High Consequence Indicators

- SPIs related to the monitoring and measurement of accidents or serious incidents are referred to as “high-consequence” indicators and are considered reactive (ICAO, 2013b).
Low Consequence Indicators

- SPIs related to incidents, non-conformance findings or deviations are referred to as “low consequence” indicators and are considered proactive/predictive (ICAO, 2013b).
Proactive = Focus on Low Consequence Events

• To ensure a proactive SMS, develop SPIs and targets related to lower consequence events (SMICG, 2013).
• These SPIs should be reviewed periodically by management and amended or updated as necessary (SMICG, 2015).
What Should You Choose?

- This is a question many safety managers are struggling with.
- SPIs are in the **Safety Assurance** component of the SMS
  - This begs the question
  - “How do we know our safety activities are working?”
Are Your Efforts Making a Difference?

• Example
  – New policy requires a risk assessment be performed before an activity, i.e. flight or maintenance task
  – Are people using it? If not, why not?
  – Are RAs making a difference? What are they doing for you?
  – Related SPIs could help
Perceptions

• Personnel could complete an end-of-day survey that asks:
  – How many activities did you perform today that required the use of a RA tool?
  – How many of these activities was a RA tool actually used?
  – If you used a RA tool today, to what degree did it help you identify and manage safety risks?
    • Not Helpful
    • Somewhat Helpful
    • Helpful
    • Very Helpful
Quantitative & Qualitative

• This survey collects both quantitative (RA tool usage rate) and qualitative (how did it work for you?) data.
• Each month and quarter, this data could be analyzed to determine how well this specific safety enhancement is being adopted by all applicable personnel and what they think of it.
• Over time, management may gain enough information to establish targets such as a 95% minimum usage rate, a maximum of 5% “Not Helpful” perceptions, and/or at least 90% “Helpful/Very Helpful” perceptions.
SMS Focus

- Hazards identified by an SMS are “focused on those conditions which could cause or contribute to unsafe operation of aircraft or aviation safety-related equipment, products and services” (ICAO, 2013b, p. 40)
- SPIs should be adapted to serve this purpose.
- Other safety aspects are important too, i.e. OHS
- However, the SMS requires SPIs related to preventing accidents related to aircraft operations.
Human Factors

- Human factors are causal in most aircraft accidents (Wiegmann & Shappell, 2001)
- Why not design SPIs to analyze human factors such as:
  - Errors/deviations from policies/procedures,
  - Distraction,
  - Mission pressure,
  - Fatigue,
  - Workload (task saturation),
  - Situational awareness,
  - Fitness,
  - Team coordination/communication effectiveness,
  - Competency.
Leading Indicators

• Leading indicators should measure both:
  – Things that have the potential to become or contribute to a negative outcome in the future (‘negative’ indicators),
  – Things that contribute to safety (‘positive’ indicators)” (SMICG, 2013, p. 6).
SPI Summary

• SPI data can be quantitative, qualitative, or a mixture.
• Data can be captured via:
  – Surveys,
  – Flight data analysis programs,
  – Maintenance tracking software,
  – Crew scheduling tools,
  – Other tools.
• Good news: flexibility - you can design SPIs to suit your needs.
References

To learn more about
SMS, IEPs, and SPIs

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