Simple & Sustainable Approach on Safety Management

Sources of information: UK CAA & Skybrary

Aviation Safety Campaign
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Challenges for non complex operators

- Limited resources
- Limited information / data
- Informal communication
- Developing an SMS appropriate to their operation
- Meeting the intent without adding valueless complexity
- Guidance for proportionality
- Difficult to develop meaningful SPIs

Essential pillars

- Keep it simple
- Turn SMS training into an opportunity
  - Use it for hazard hunting
  - Agreeing on biggest risks
  - Risk mitigation strategies
- Collaborate with others

How should CAA cooperate ?

- Consider small organisation conditions
- Proportionate SMS evaluation
- Encouraging and Facilitating collaboration
- Industry workshops
- Complex / non complex calculator

Simple but smart SPIs

- Reporting levels
- Improving the Ratio between Mandatory Occurrence Events and other safety reports.
- Number of Maintenance events
- MEL usage
- Safety committee meeting attendance

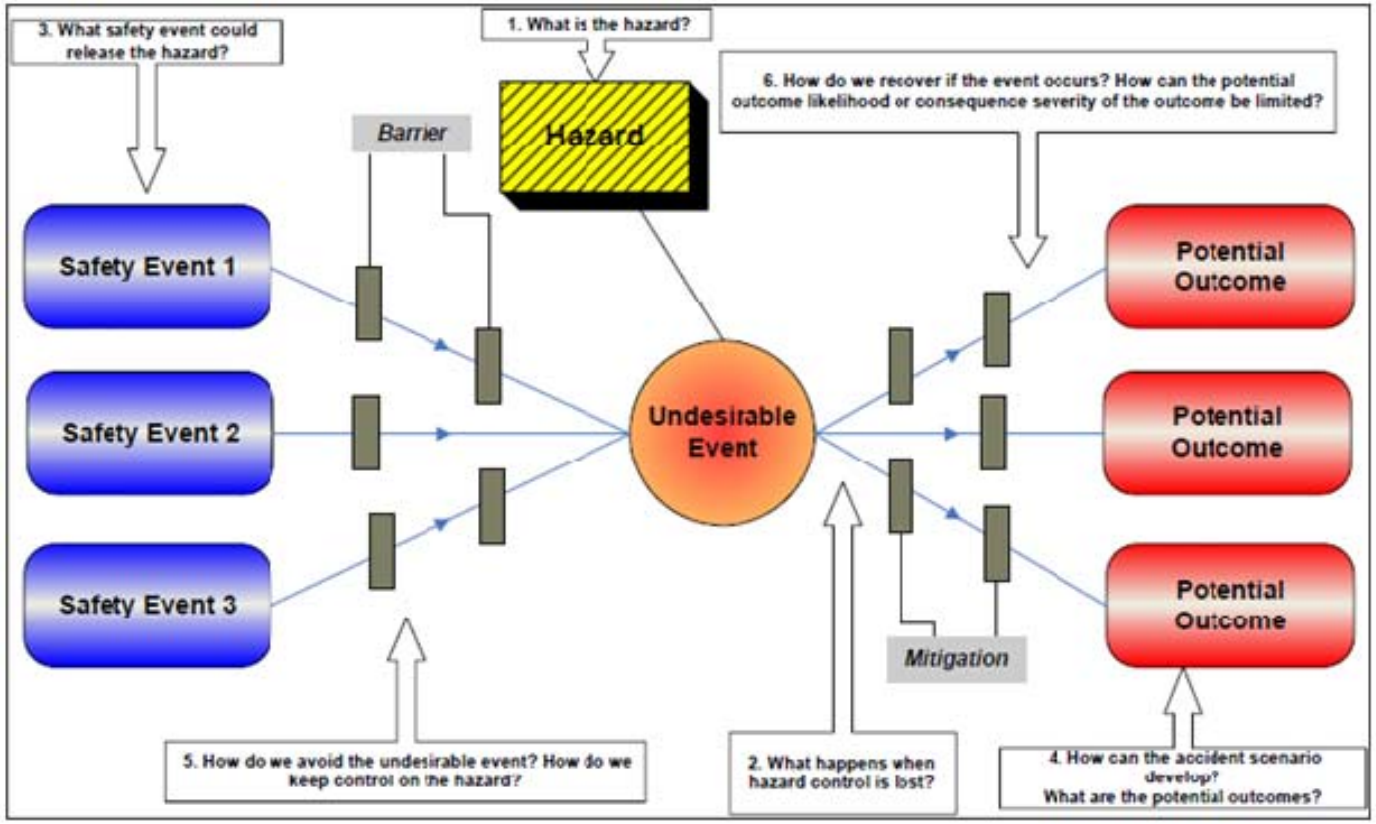
Safety objectives and safety performance indicators

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 Airworthiness Incidents (as defined in SMM)	3 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												
Number of ERP Drills	1												
Number of Hazard / Safety Reports	More than 20												
Number of flights flown with operational MEL restrictions	100%												
Number of Safety Newsletters issued	2												
Number of Formal Risk Assessments	5 or more												
Number of Safety Surveys	1												

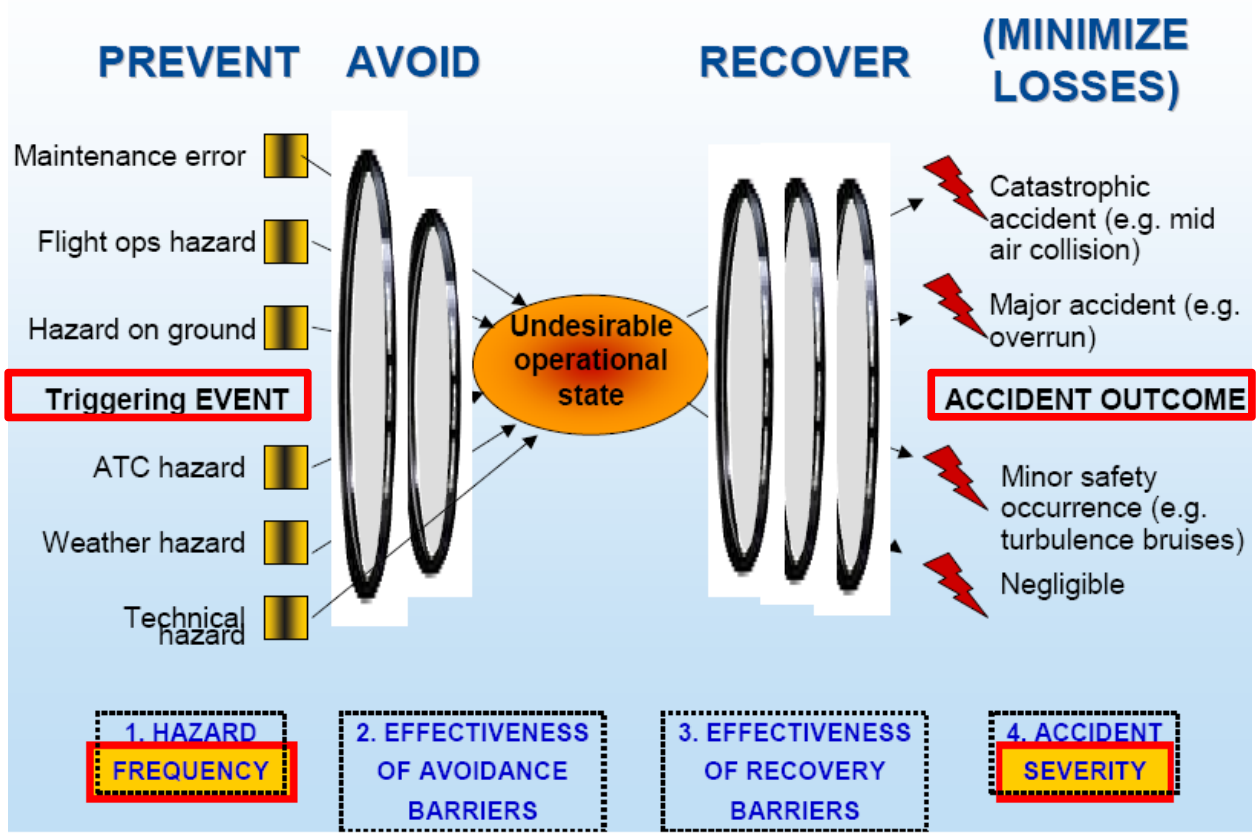
Small operator SMS manual

- Written in simpler language
- Includes some helpful forms (ie. reporting forms)
- Key points to Safety Risk Management
  - Implement an easy model to understand event causation (Bow Tie)
  - Risk evaluation tool (ie. ARMS)
- Simple self assessment questionnaire (performance based audit forms)

Bow Tie model: understanding the chain events



A picture of BowTie application



Aviation Risk Management Solutions – ARMS methodology

It is an overall process for Operational Risk Assessment

- The whole process ensures that any necessary safety actions are identified, creates a Register for following up risks and actions and provides a Safety Performance Monitoring function

The assessment process starts with Event Risk Classification (ERC)

- First review of events in terms of urgency and the need for further investigation. This step also attaches a risk value to each event - which is necessary for creating safety statistics reflecting risk.

The next step is data analysis in order to identify current Safety Issues

- These Safety Issues are then risk assessed in detail through the Safety Issue Risk Assessment (SIRA). SIRA can also be used to make Safety Assessments, which is a requirement of the "Management of Change" element of the SMS.

ARMS in a Nutshell

ERC

Event Risk Classification *First step for all incoming data*

HOW TO DO IT:

Question 2: What was the effectiveness of the remaining barriers between this event and the most credible accident scenario?				Question 1: If this event had escalated into an accident outcome, what would have been the most credible outcome?		Typical accident scenarios
Effective	Limited	Minimal	Not effective			
50	102	502	2500	Catastrophic Accident	Loss of aircraft or multiple fatalities (3 or more)	Loss of control, mid air collision, uncontrollable fire on board, explosions, total structural failure of the aircraft, collision with terrain
10	21	101	500	Major Accident	1 or 2 fatalities, multiple serious injuries, major damage to the aircraft	High speed taxiway collision, major turbulence injuries
2	4	20	100	Minor Injuries or damage	Minor injuries, minor damage to aircraft	Pushback accident, minor weather damage
1				No accident outcome	No potential damage or injury could occur	Any event which could not escalate into an accident, even if it may have operational consequences (e.g. diversion, delay, individual sickness)

Answer Question 1:
•Think how the event could have escalated into an accident outcome (see examples to the right of the ERC matrix). Typically, the escalation could be due to actions by the people involved, the way the hazard interferes with the flight, and barrier behaviour.
• Do not filter out improbable scenarios. Question 2 will take the (low) probability into account.
• Among the scenarios with an accident outcome, pick the most credible, and select the corresponding row in the matrix.

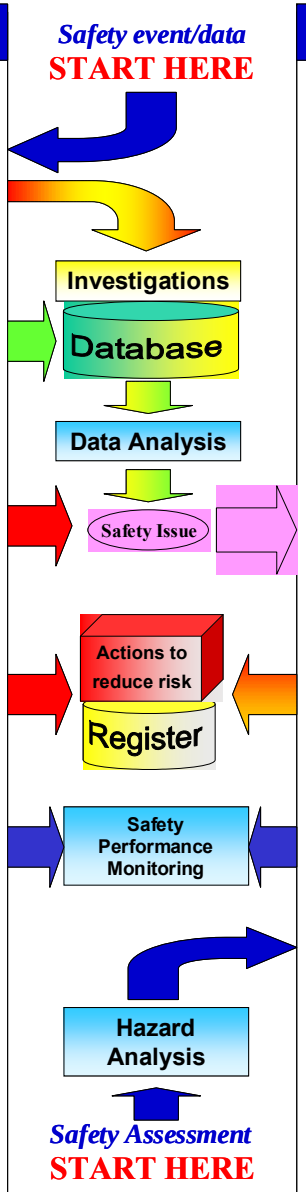
Answer Question 2:
•To assess the remaining safety margin, consider both the number and robustness of the remaining barriers between this event and the accident scenario identified in Question 1.
• Barriers, which already failed are ignored
•Select the column of choice. See section 4.2 for detailed guidance.

RESULT:*

→ Immediate action & further investigation required
→ More refined Risk Assessment and/or investigation required.
→ No action required. Contributes to the Safety Database.

21 ERC Risk Index number → Use in database analysis (trending & statistics)

* Examples only. To be customised at each organisation.



Quick Reference Guide

SIRA

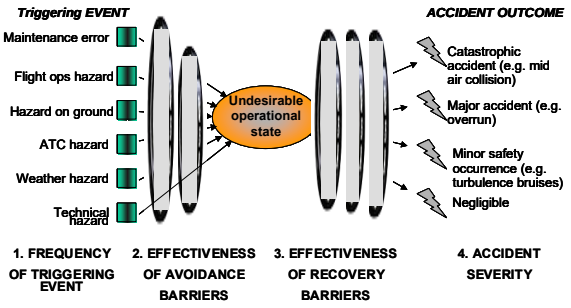
Safety Issue Risk Assessment

Used for:
• Safety Issues
• Safety Assessments, when quantifiable (Management of Change process)

HOW TO DO IT:

Define the Safety Issue precisely:
• Scope the issue in terms of hazards, locations, a/c types, etc. See section 4.8 for detail.

Develop the related potential accident scenarios:
• There may be several accident scenarios within one Safety Issue (see *glossary*)
• Select the most critical scenarios (one or more) for the risk assessment



Analyse (each) Scenario using the SIRA model (above):
• Identify the accident outcome of the scenario
• Identify what is considered the triggering event (see section 6.9 for detail)
• Decide what you consider as the UOS.
• List the avoidance and recovery barriers and review their robustness

Run the SIRA with numbers:
• Consider using the SIRA Excel tool
• Select a known or an estimated value for each of the 4 SIRA components

RESULT:* *(see section 4.8 for detail)*

Stop
Improve
Secure
Monitor
Accept

→ "Stop": Discontinue the concerned part of the operation until acceptable risk level.
→ "Improve": Still unacceptable risk but tolerable for a short time. Action required.
→ "Secure": Frequent monitoring required, as the item is at the limit of acceptable.
→ "Monitor": Monitor through the routine database analysis.
→ "Acceptable". No specific action required.

ARMS – Aviation Risk Management Solutions

- ARMS aims to be pragmatic and useful, while remaining conceptually robust
- ARMS is not limited to current outcomes; Safety Issues Risk Assessment method can be applied to future risks “safety assessment”
- The methodology takes into account both the preventive and recovery barriers
- Barriers complexity may produce no-realistic probability-of-failure calculations if appropriate probabilistic models are not used
- The methodology may fall short in some cases, particularly those involving human factors
- Severity assessment is based on “the most probable accident outcome”; it incorporates some subjectivity