



HAZARD IDENTIFICATION & ASSESSING RISKS

WHAT ARE THE RISKS IN YOUR STATE?

*EU-South East Asia Aviation Partnership Project (EU-SEA APP)
This project is funded by the European Union and implemented
by the European Union Aviation Safety Agency - EASA*

Your safety is our mission.

An Agency of the European Union 

Hazard identification & safety risk assessment

- 3.3.4.1 States shall establish and maintain a process to identify hazards from collected safety data.
- Note 1. — Further information on data collection... can be found in Chapter 5
- Note 2.— Additional information on hazards... in Final Reports of accidents & incidents
- 3.3.4.2 States shall develop and maintain a process that ensures the assessment of safety risks associated with identified hazards.

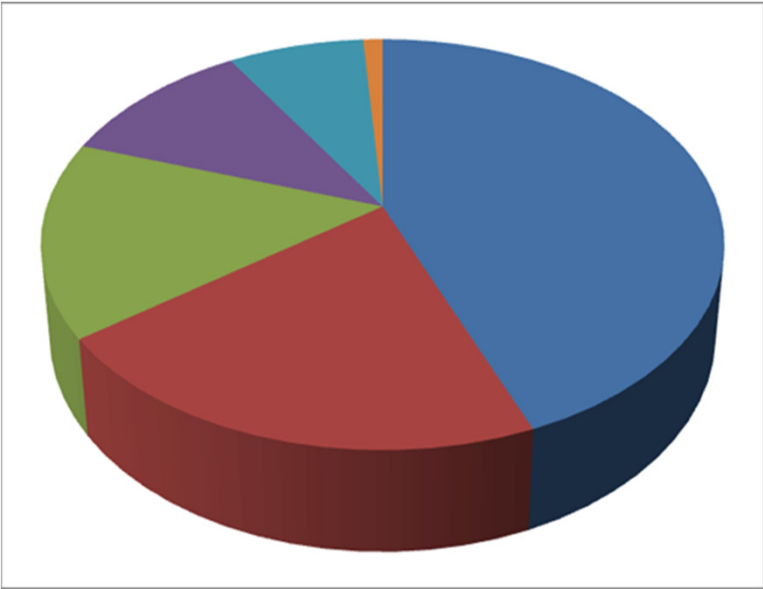
Hazard Identification



Definition of a Hazard

→ **Hazard.** *A condition or an object with the **potential** to cause or contribute to an aircraft incident or accident.*

Identification of HAZARDS

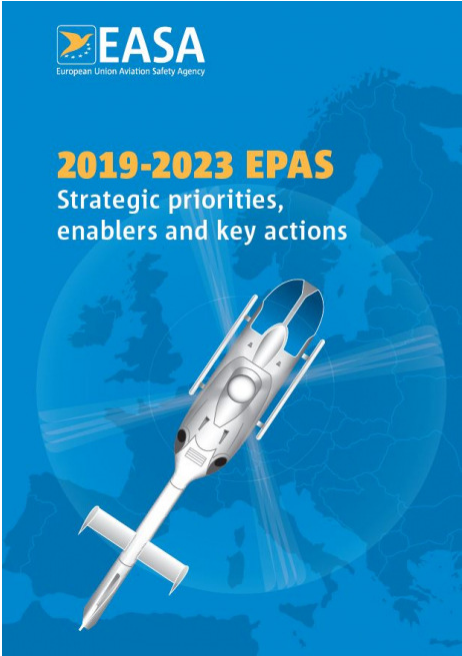


How Can You Identify Hazards?

- Data you collect and analyse
- International data / analysis
- Insurance statistics
- Industry data / SMS priorities
- Professional knowledge/ experts
- Front line surveys / workshops
- Accident investigation reports
- Relevant geography / weather
- Emerging issues e.g. drones
- Risk models e.g. bowties




International Priorities



ICAO / Safety

Safety


- Global Plans
 - Global Aviation Safety Plan (GASP)
- Safety Priorities
 - Runway Safety
 - Controlled Flight Into Terrain (CFIT)
 - Loss of Control-Inflight (LOC-I)
 - Global Flight Tracking
- SARPs and PANS




Annual Safety Report




Runway Safety



Loss of Control In-Flight



Fatigue Management

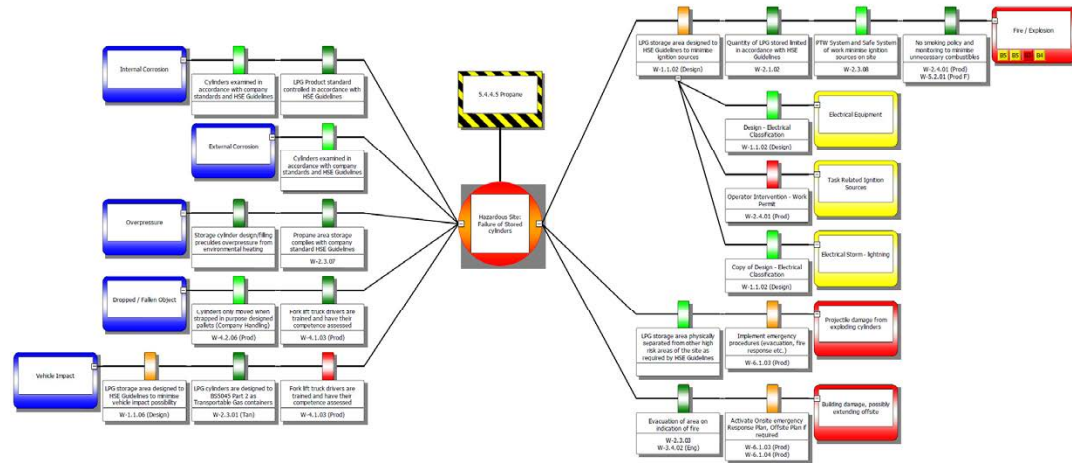
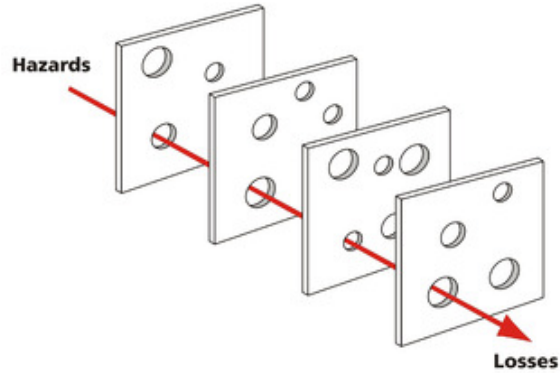


Safety Management



Crises and Rapid Response (CRR) Programme

Models



Risk Assessment



Definition of risk

- **Risk** – The assessment, expressed in terms of predicted **probability** and **severity**, of the consequence(s) of a hazard taking as reference the worst foreseeable situation.
- *A wind of 15 knots blowing directly across the runway is a **hazard**.*
- *The potential that a pilot may not be able to control the aircraft during take-off or landing is one of the **consequences** of the hazard.*
- *The assessment of the consequences of the potential loss of control of the aircraft by the pilot expressed in terms of probability and severity is the **risk**.*

Probability of occurrence

Qualitative definition	Meaning	Value
Frequent	Likely to occur many times (<i>has occurred frequently</i>)	5
Occasional	Likely to occur some times (<i>has occurred infrequently</i>)	4
Remote	Unlikely, but possible to occur (<i>has occurred rarely</i>)	3
Improbable	Very unlikely to occur (<i>not known to have occurred</i>)	2
Extremely improbable	Almost inconceivable that the event will occur	1

Severity of occurrences		
Aviation definition	Meaning	Value
Catastrophic	<ul style="list-style-type: none"> ➤ Equipment destroyed. ➤ Multiple deaths. 	A
Hazardous	<ul style="list-style-type: none"> ➤ A large reduction in safety margins, physical distress or a workload such that the operators cannot be relied upon to perform their tasks accurately or completely. ➤ Serious injury. ➤ Major equipment damage. 	B
Major	<ul style="list-style-type: none"> ➤ A significant reduction in safety margins, a reduction in the ability of the operators to cope with adverse operating conditions as a result of increase in workload, or as a result of conditions impairing their efficiency. ➤ Serious incident. ➤ Injury to persons. 	C
Minor	<ul style="list-style-type: none"> ➤ Nuisance. ➤ Operating limitations. ➤ Use of emergency procedures. ➤ Minor incident. 	D
Negligible	<ul style="list-style-type: none"> ➤ Little consequences 	E

Safety Risk		Severity				
Probability		Catastrophic A	Hazardous B	Major C	Minor D	Negligible E
Frequent	5	5A	5B	5C	5D	5E
Occasional	4	4A	4B	4C	4D	4E
Remote	3	3A	3B	3C	3D	3E
Improbable	2	2A	2B	2C	2D	2E
Extremely improbable	1	1A	1B	1C	1D	1E

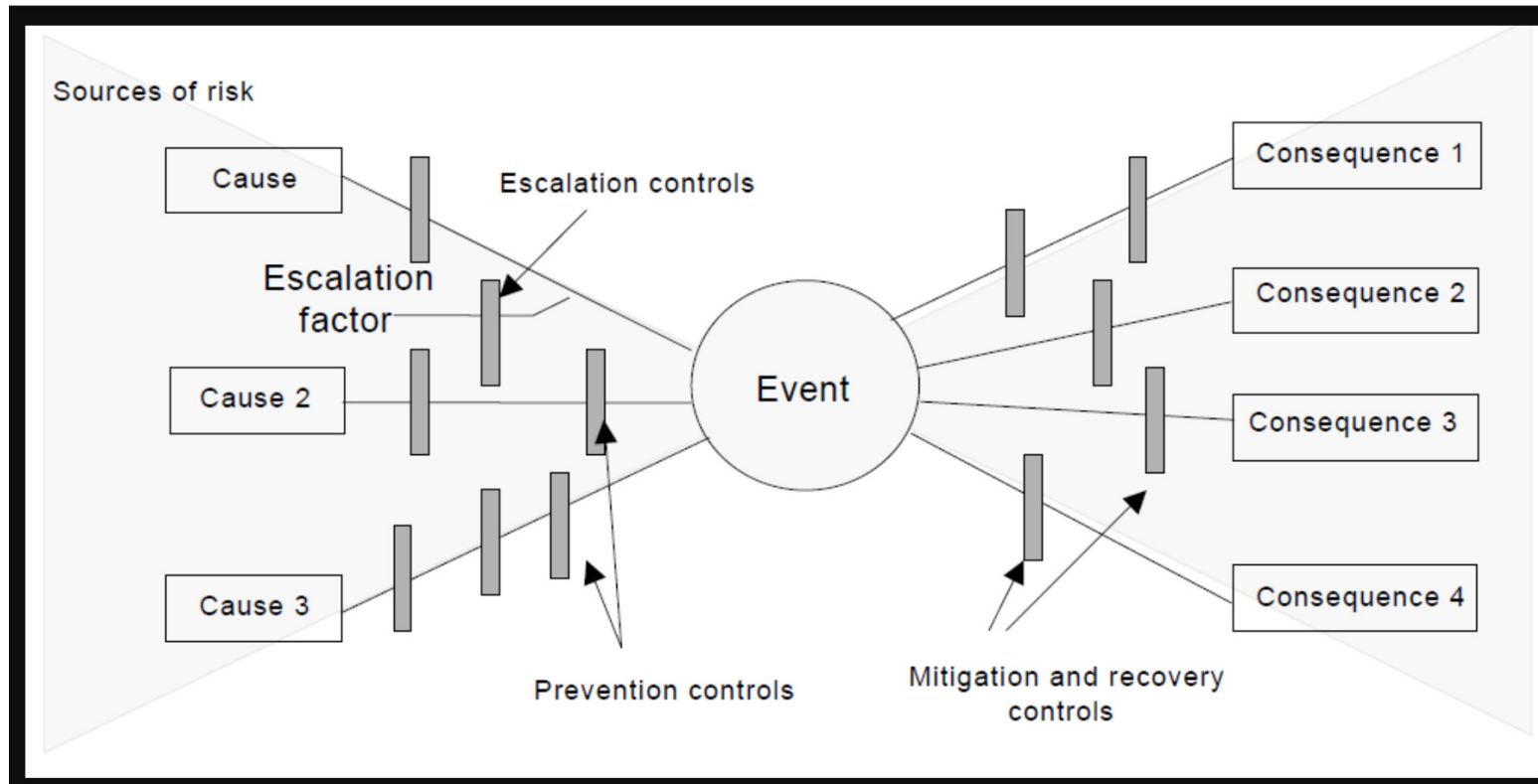
Safety risk management at a glance



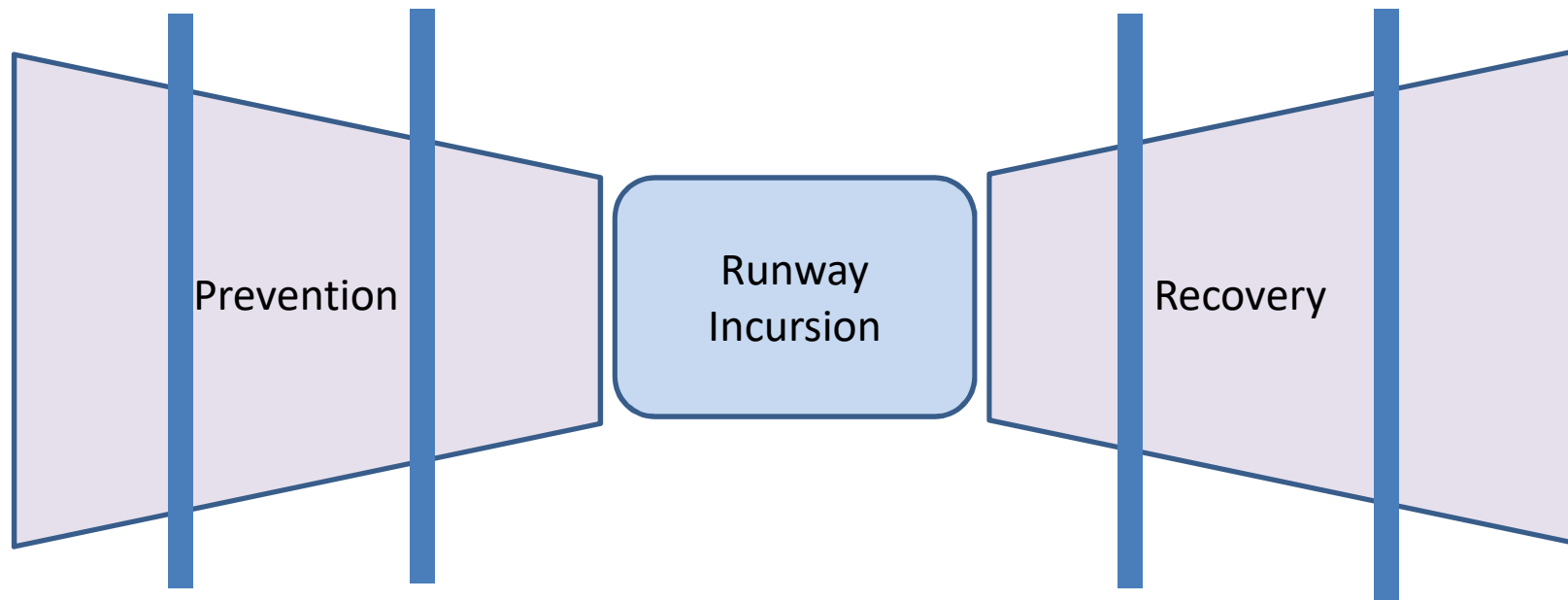
Assessing probability of consequence remember:

- Basic exposure – how often does the situation occur? What might it coincide with?
- Existing controls such as training, procedures, regulations, equipment (including basic reliability)
- Human Factors – what issues are making errors or performance issues more or less likely

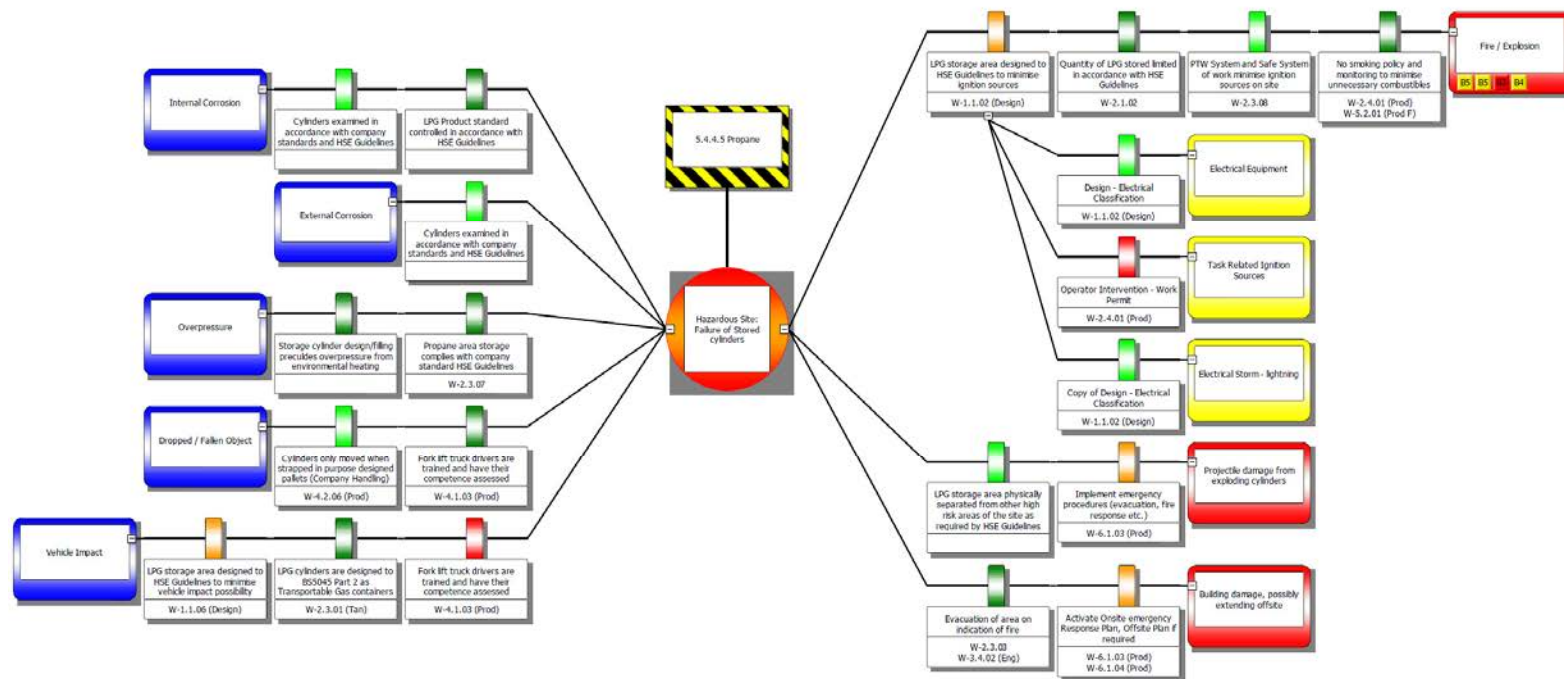
Bow Tie Concept



Very (very) basic conceptual bow tie – what are the barriers you can think of?



Bow Tie Analysis



Hazard: Poor Airport Signage

Aircraft in incorrect / unexpected location

Potential Consequences

- Delay / difficulty recovering situation
- Low speed collision on taxiway
- High speed collision on runway

Ratings

Safety Risk	Probability	Severity				
		Catastrophic A	Hazardous B	Major C	Minor D	Negligible E
Frequent	5	5A	5B	5C	5D	5E
Occasional	4	4A	4B	4C	4D	4E
Remote	3	3A	3B	3C	3D	3E
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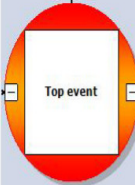

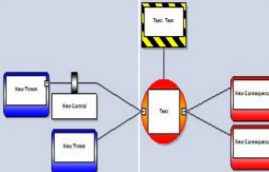

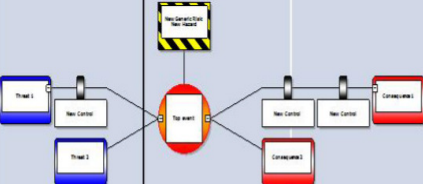
Hazard: Bad Weather

Potential Consequences

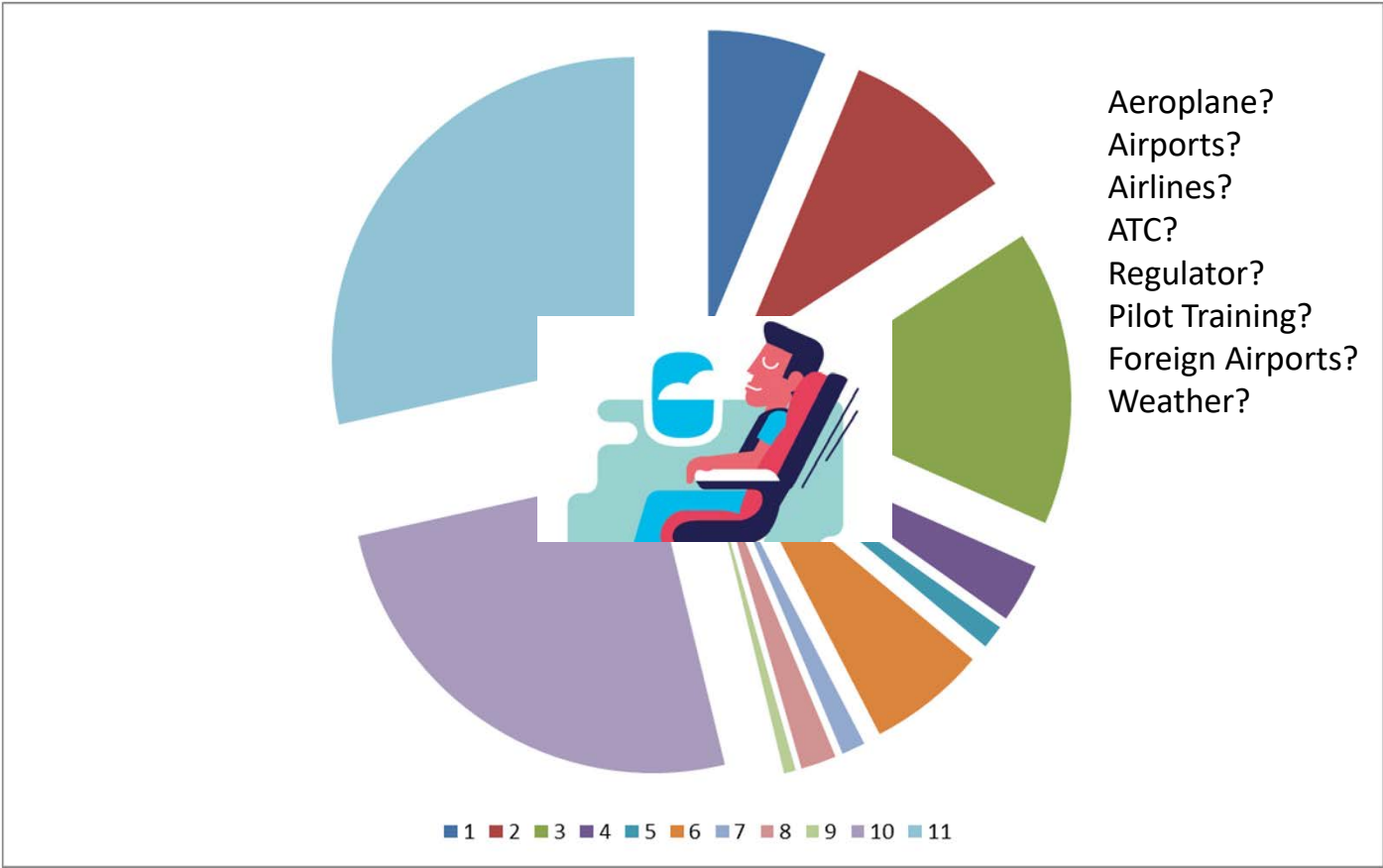
- Delay / damage to aircraft on the ground / diversions
- Wind-shear / abnormal runway contact / excursion
- Loss of Control in Flight

Ratings

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Hazard	Outcome	Severity of Outcome	Likelihood	Risk	Mitigation	Severity of outcome	Likelihood	Risk
<p>List of bowtie threats</p> 	<p>The worst credible outcome linked to the particular threat via the top event within the bowtie</p>  	<p>Using ICAO (5x5) or ARMS (ERC) matrix considering the severity of the outcome</p>   	<p>Considering the barriers/control s within the appropriate bowtie - how likely is the threat to cause the outcome?</p>	<p>Calculate the score based on the chosen matrix</p>	<p>If the score is unacceptable and requires mitigation, refer to the bowtie for possible changes to the system – remember to consider transfer of risk which is easily identifiable on a bowtie</p> 	<p>Consider the effectiveness of the new or improved mitigations (controls) for reducing the severity of the outcome</p>	<p>Consider the effectiveness of the new or improved mitigations (controls) for likelihood of the threat escalating into the outcome</p>	<p>Calculate the new risk score based on the new or improved mitigations</p>

Sources of Flight Safety Risks to Thai Citizens?



Summary

Hazards: Potential for harm

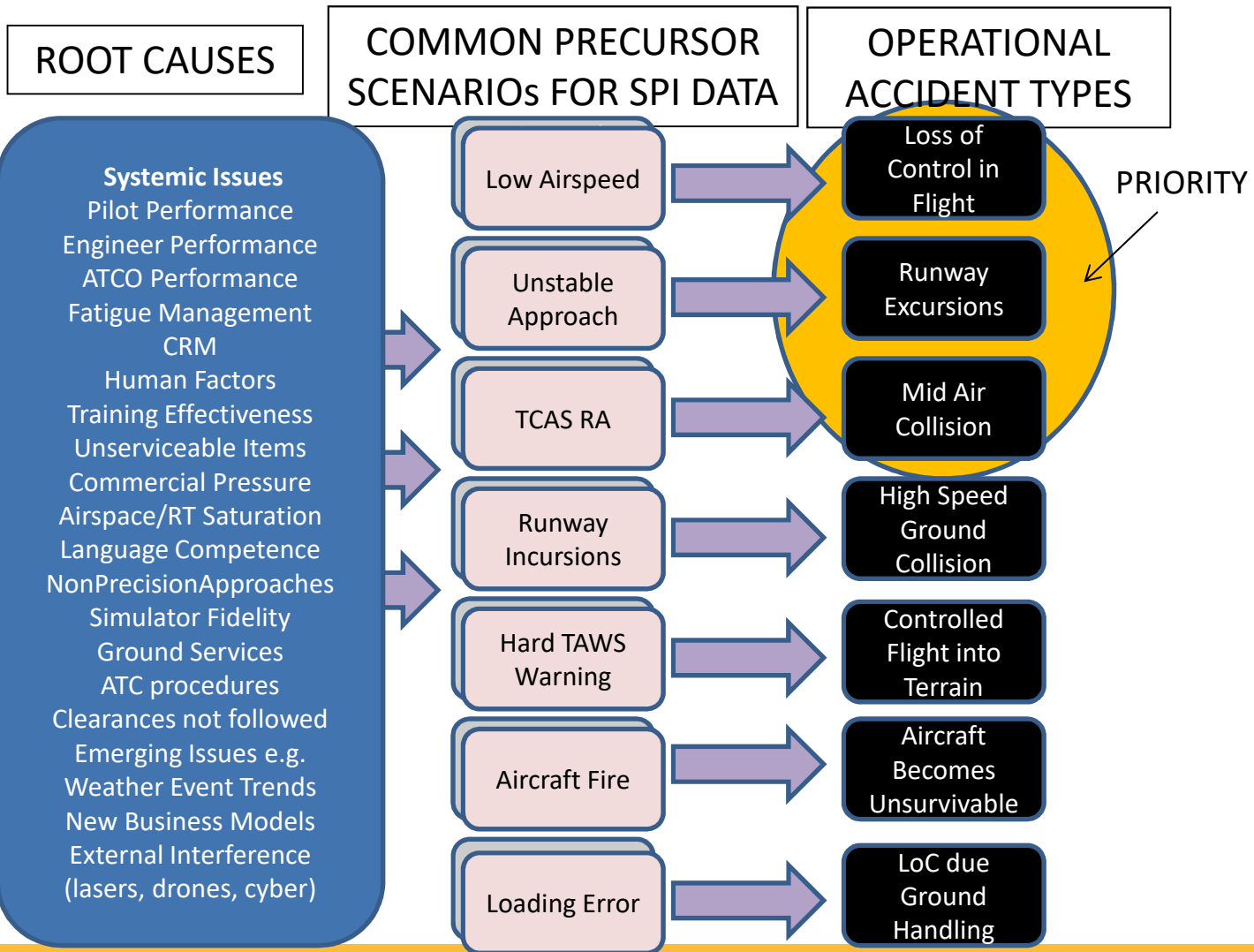
- Your data
- Other data
- Expertise

Risks: Likelihood x Severity

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Probability		Catastrophic A	Hazardous B	Major C	Minor D	Negligible E
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Organising Risks

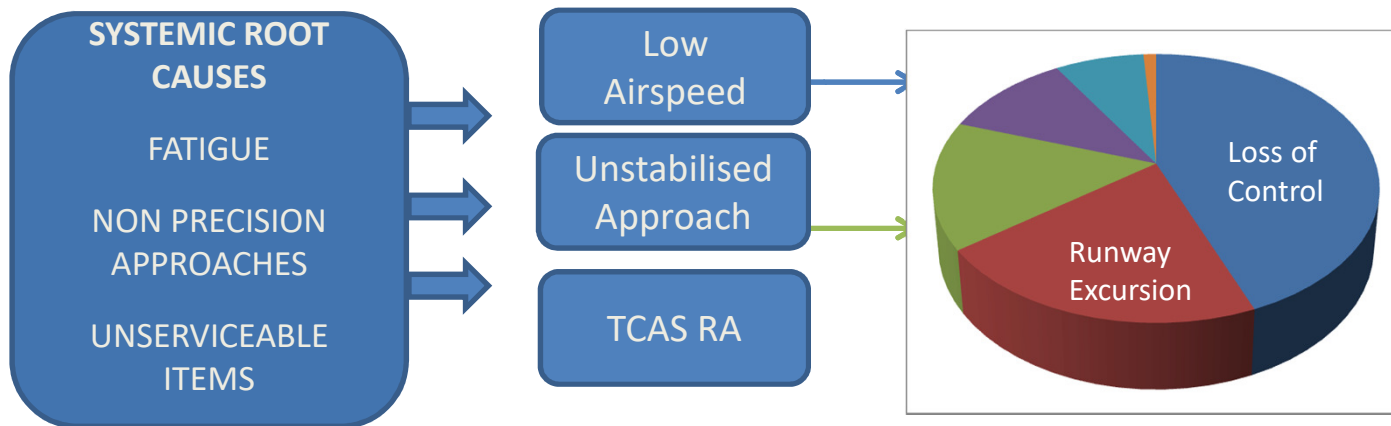




'Good Practice'
SPIs for Systemic
Root Causes

Operational SPIs
focus on Common
precursors

Accident & Incident
Statistics show relative
frequency of common
accident types





END

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