Beyond Certification
eVTOL Safety Management with BowTie

ACROSS
SAFETY DEVELOPMENT

Our mission – your success – everyone's safety

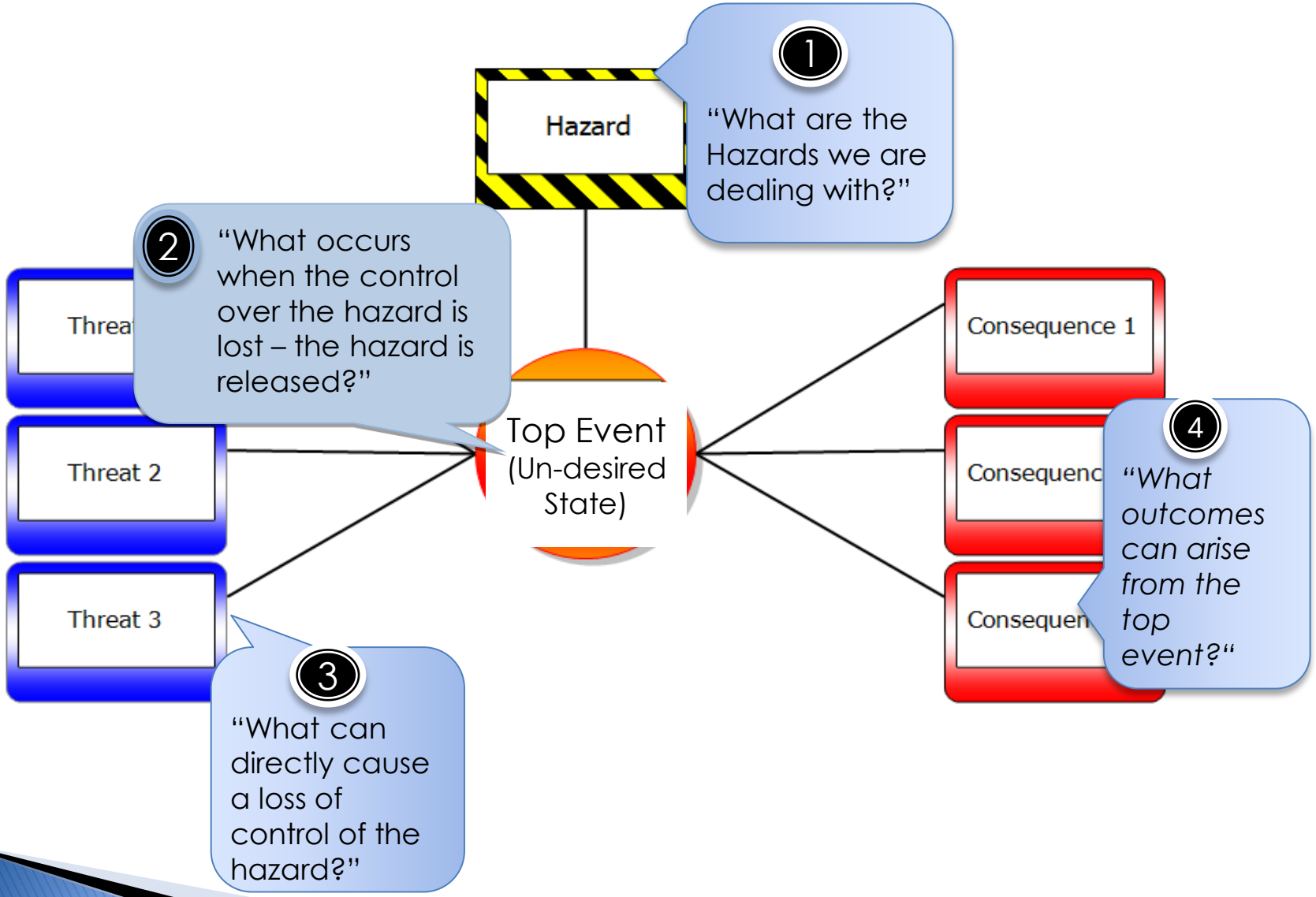

QANTAS
LONGREACH

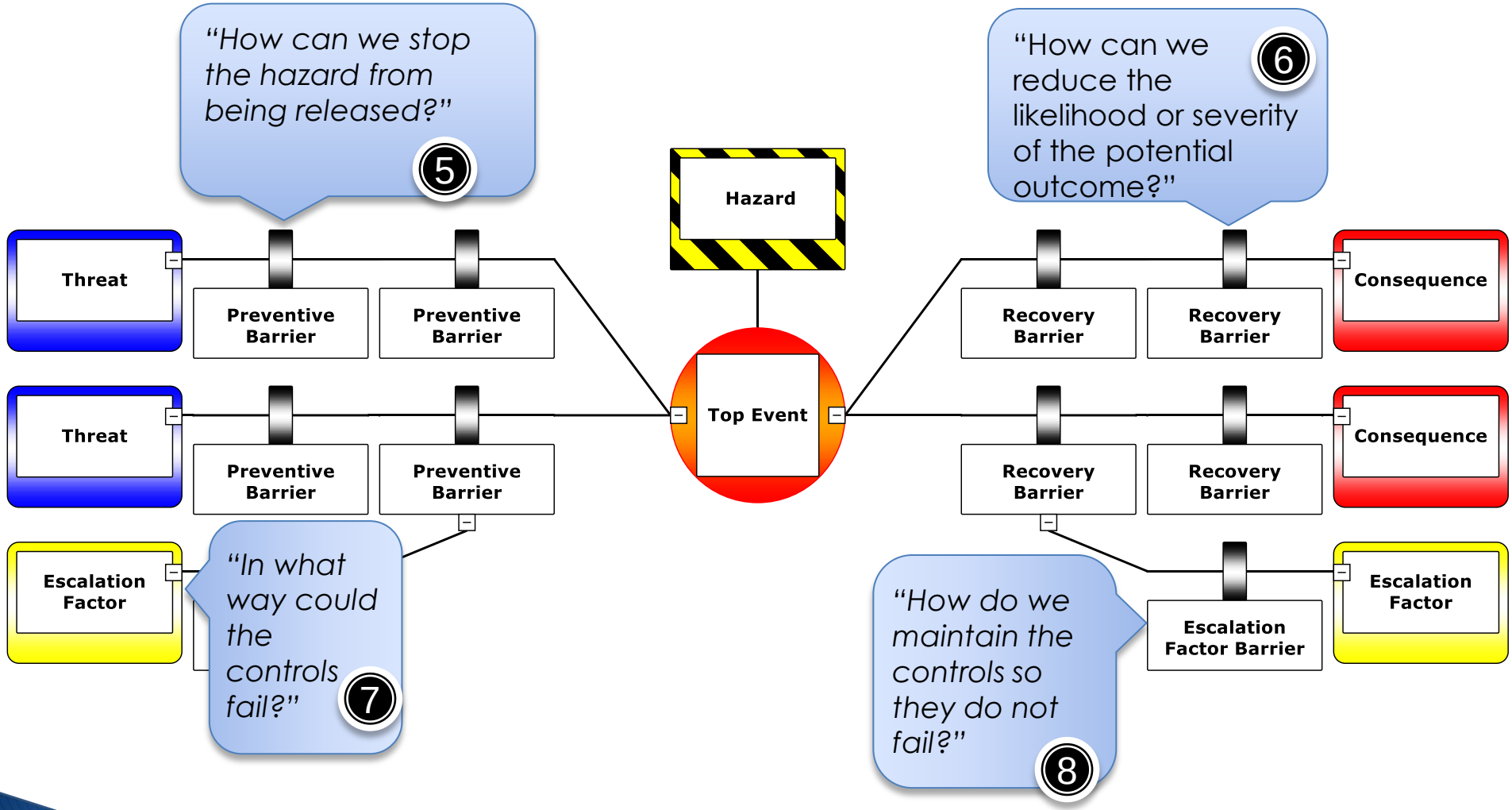
Do you have an effective SMS?

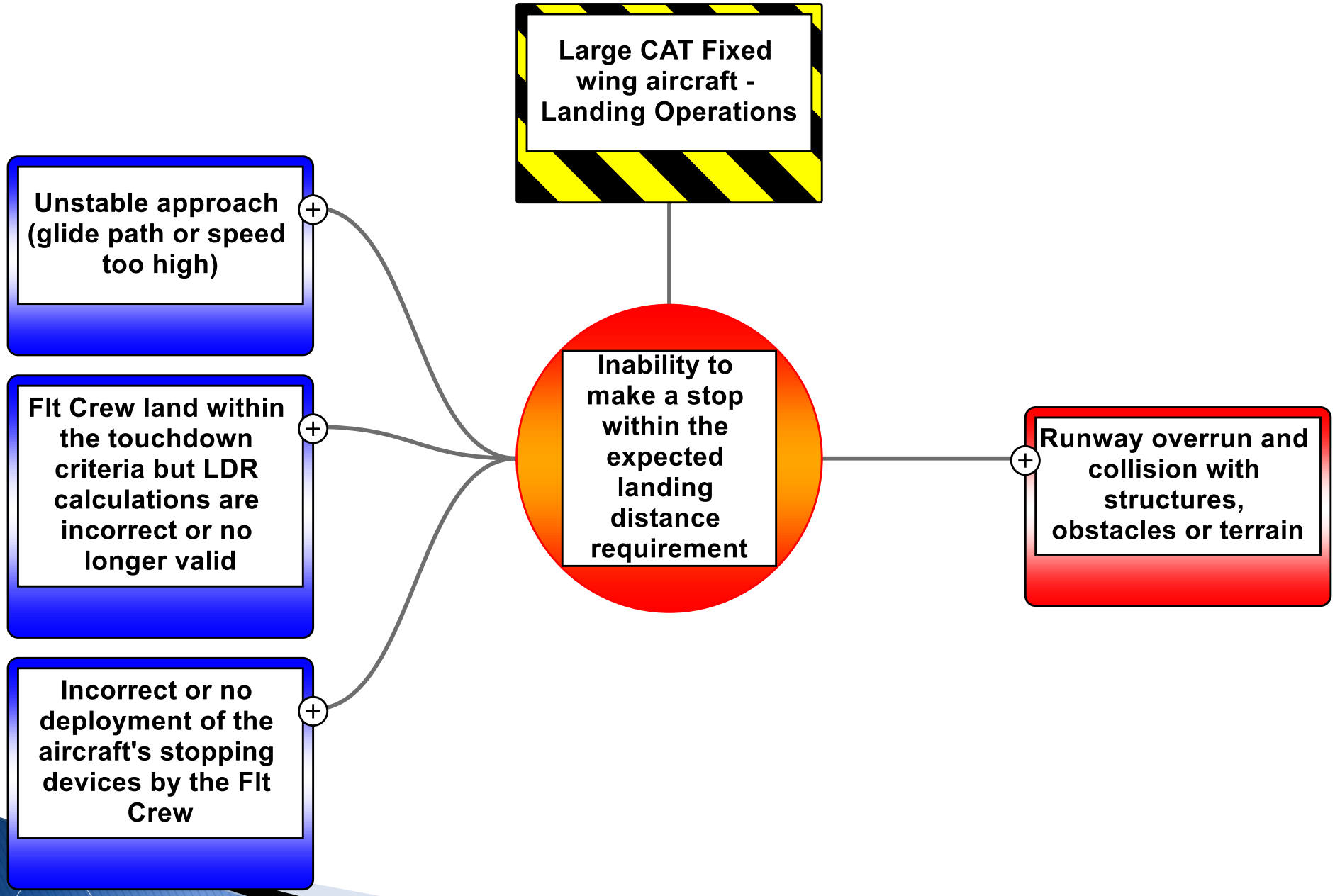
1. What is most likely to be the cause of your next accident or serious incident?
2. How do you know that?
3. What are you doing about it?
4. Is it working?

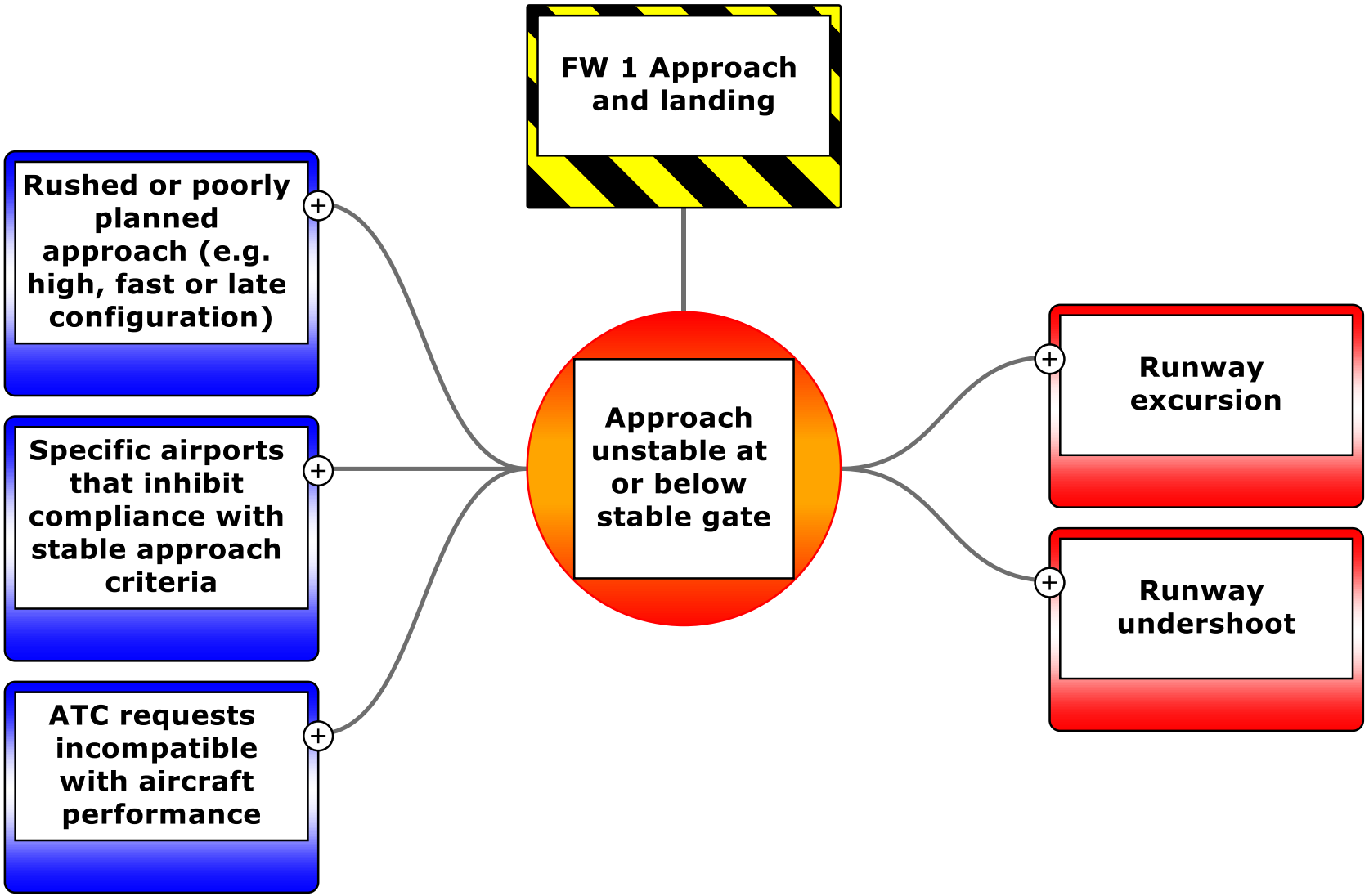
(Bill Voss, Flight Safety Foundation)

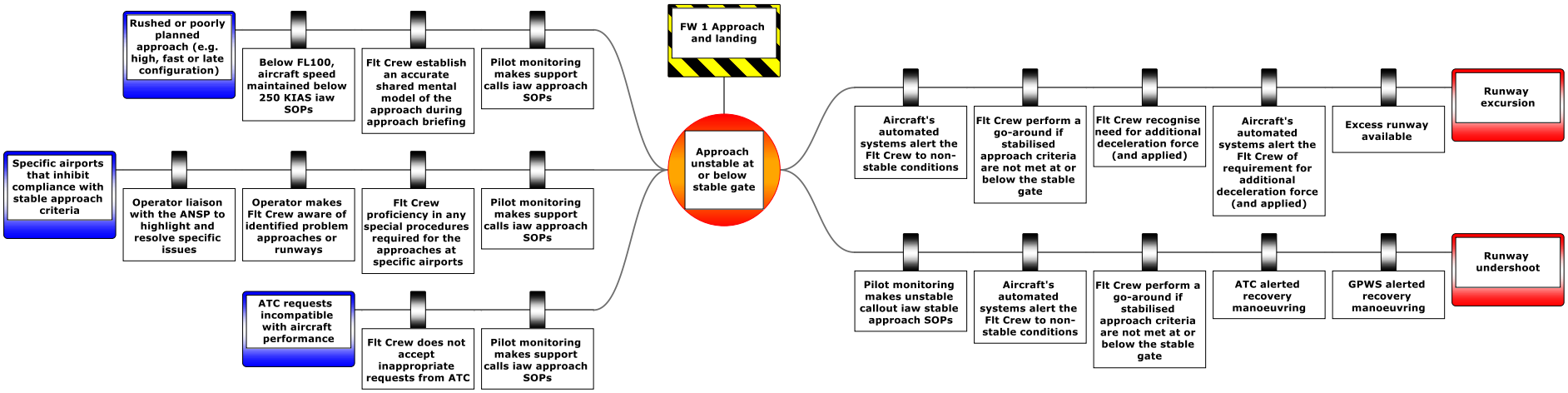
- Oil & Gas
- Chemical
- Aviation
- Medical
- Financial
- Governmen
- IT

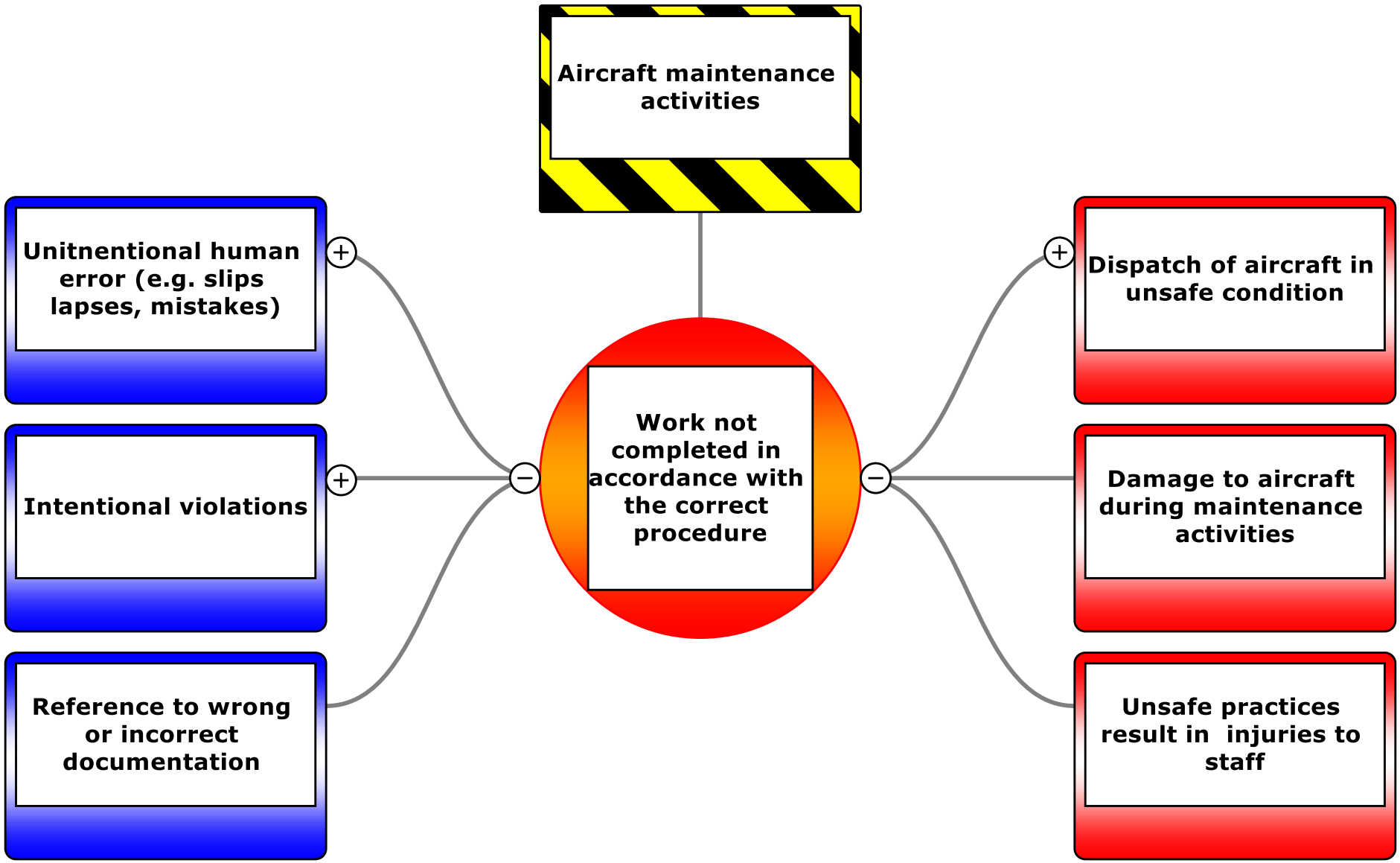




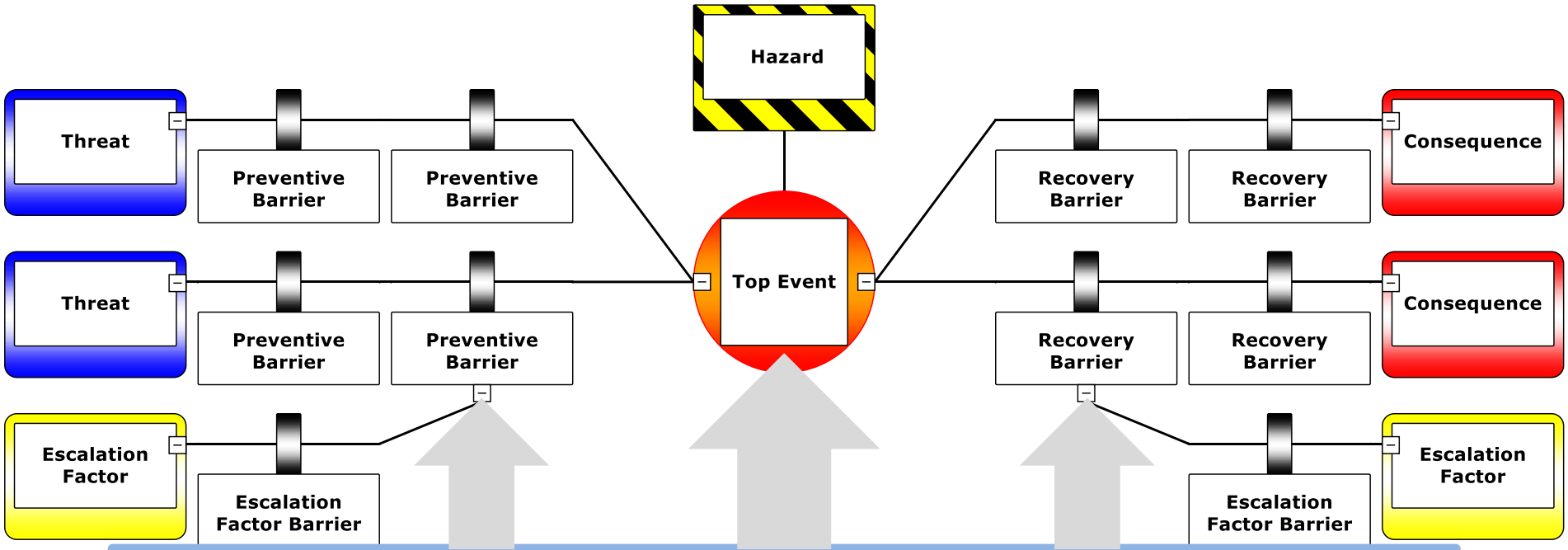



FW 1 Approach and landing
Rushed or poorly planned approach (e.g. high, fast or late configuration)
Specific airports that inhibit compliance with stable approach criteria
ATC requests incompatible with aircraft performance
Approach unstable at or below stable gate
Runway excursion
Runway undershoot


Rushed or poorly planned approach (e.g. high, fast or late configuration)
Below FL100, aircraft speed maintained below 250 KIAS iaw SOPs
Flt Crew establish an accurate shared mental model of the approach during approach briefing
Pilot monitoring makes support calls iaw approach SOPs
Specific airports that inhibit compliance with stable approach criteria
Operator liaison with the ANSP to highlight and resolve specific issues
Operator makes Flt Crew aware of identified problem approaches or runways
Flt Crew proficiency in any special procedures required for the approaches at specific airports
Pilot monitoring makes support calls iaw approach SOPs
ATC requests incompatible with aircraft performance
Flt Crew does not accept inappropriate requests from ATC
Pilot monitoring makes support calls iaw approach SOPs
FW 1 Approach and landing
Approach unstable at or below stable gate
Aircraft's automated systems alert the Flt Crew to non-stable conditions
Flt Crew perform a go-around if stabilised approach criteria are not met at or below the stable gate
Flt Crew recognise need for additional deceleration force (and applied)
Aircraft's automated systems alert the Flt Crew of requirement for additional deceleration force (and applied)
Excess runway available
Runway excursion
Pilot monitoring makes unstable callout iaw stable approach SOPs
Aircraft's automated systems alert the Flt Crew to non-stable conditions
Flt Crew perform a go-around if stabilised approach criteria are not met at or below the stable gate
ATC alerted recovery manoeuvring
GPWS alerted recovery manoeuvring
Runway undershoot



Basic BowTie diagram



Effectiveness | Job titles | Criticalities

Barrier type | Systems | RAM scores

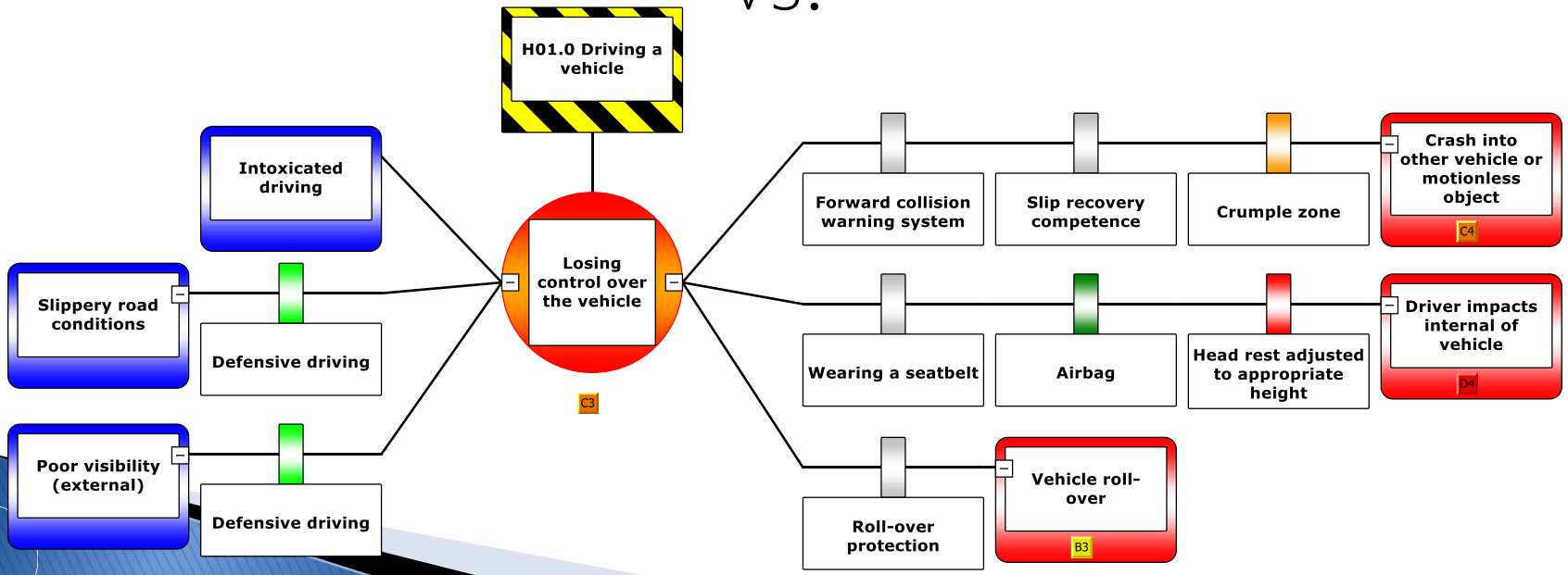
Actions | Documents | Activities

Management System

Visualisation/ Communication

LOCATION	ITEM	EFFECTS OF HAZARD IDENTIFIED	RISK ASSESS	RISK CONTROL
All Offices	General office work, Operation of office equipment (computers, photocopiers)	Manual Handling & Ergonomics Electrical Safety	Very Low-Low	Staff Induction and Training Refer to University Guidelines for Manual Handling and Ergonomics Refer to Equipment Operation Manuals and other relevant SOP's
All Laboratories	General laboratory work, preparation of chemical reagents, experiments involving chemicals	Manual Handling & Ergonomics Chemical exposure Electrical Safety	Medium	Staff Induction and Training Refer to University Policy on Guidelines for Laboratory Conduct Refer to University Chemical Management Policy Guidelines Refer to Chemical MSDS and follow recommendations Maintain Chemical Register Refer to Equipment Operation Manuals and other relevant SOP's
Specialist Laboratories	As above, but includes Quarantine and PC labs, Radioisotope Labs, Analytical Facilities, Wine Science Laboratories	As above, but may include: Quarantine and PC Containment, Radiation Exposure, Working on Specialist Equipment or in Confined Spaces	Medium	As above, but may include: Refer to relevant Quarantine and PC Policies and Legislation Refer to relevant Radiation Policies and Legislation

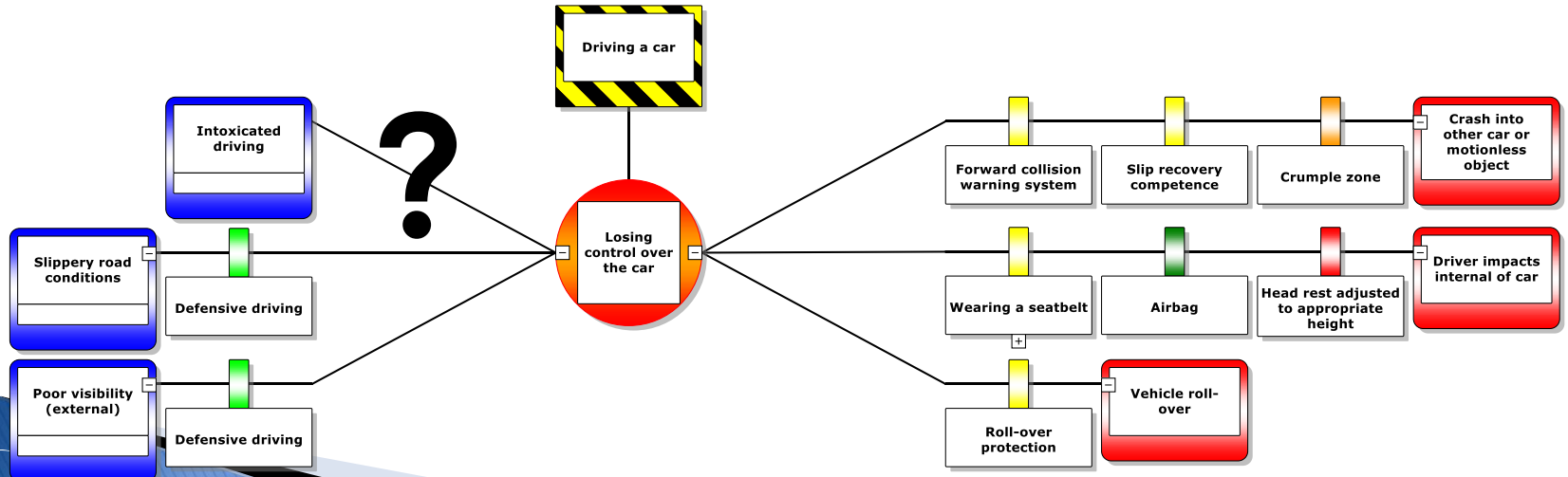
VS.



Risk analysis

	A	B	C	D	E
1	**Risk**	**Threats**	**Consequences**	**Barriers**	**Risk level**
2	Driving a car / Losing control over the car	Intoxicated driving Slippery road conditions Poor visibility (external)	Crash into other car or motionless object Driver impacts Internal of car Vehicle roll-over	Airbag Crumple zone Defensive driving procedure Forward Colision Warning System Head rest adjustment to appropriate height Roll-over protection Seatbelt Slip recovery competence	**Med**

Do you have enough barriers?



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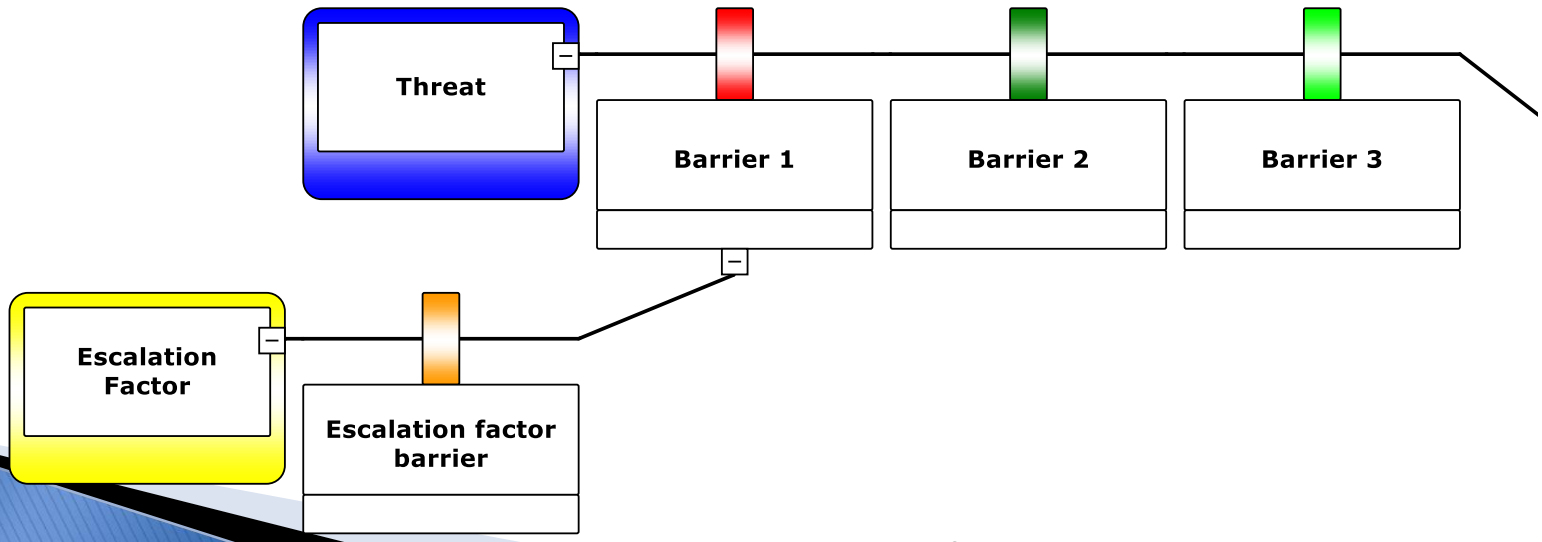
How effective are your barriers?



Risk Evaluation

	A	B	C	D	E
1	**Risk**	**Threats**	**Consequences**	**Barriers**	**Risk level**
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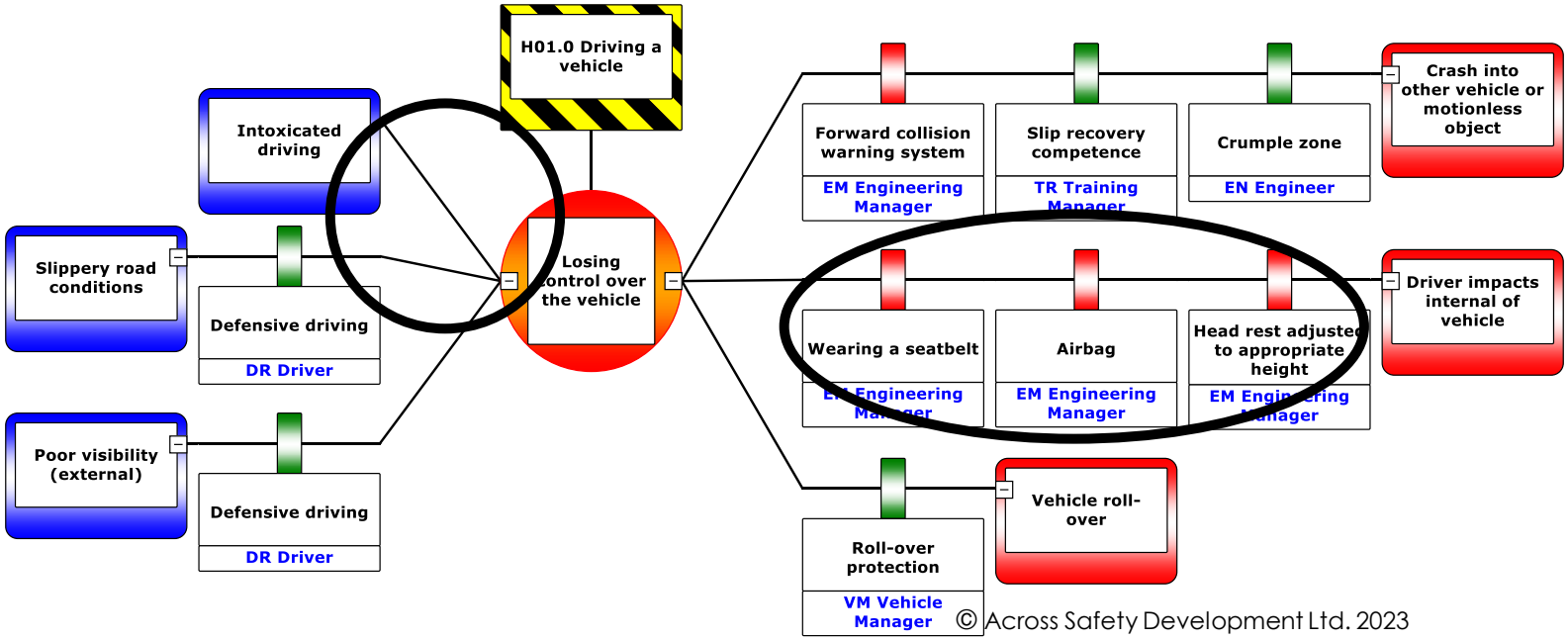
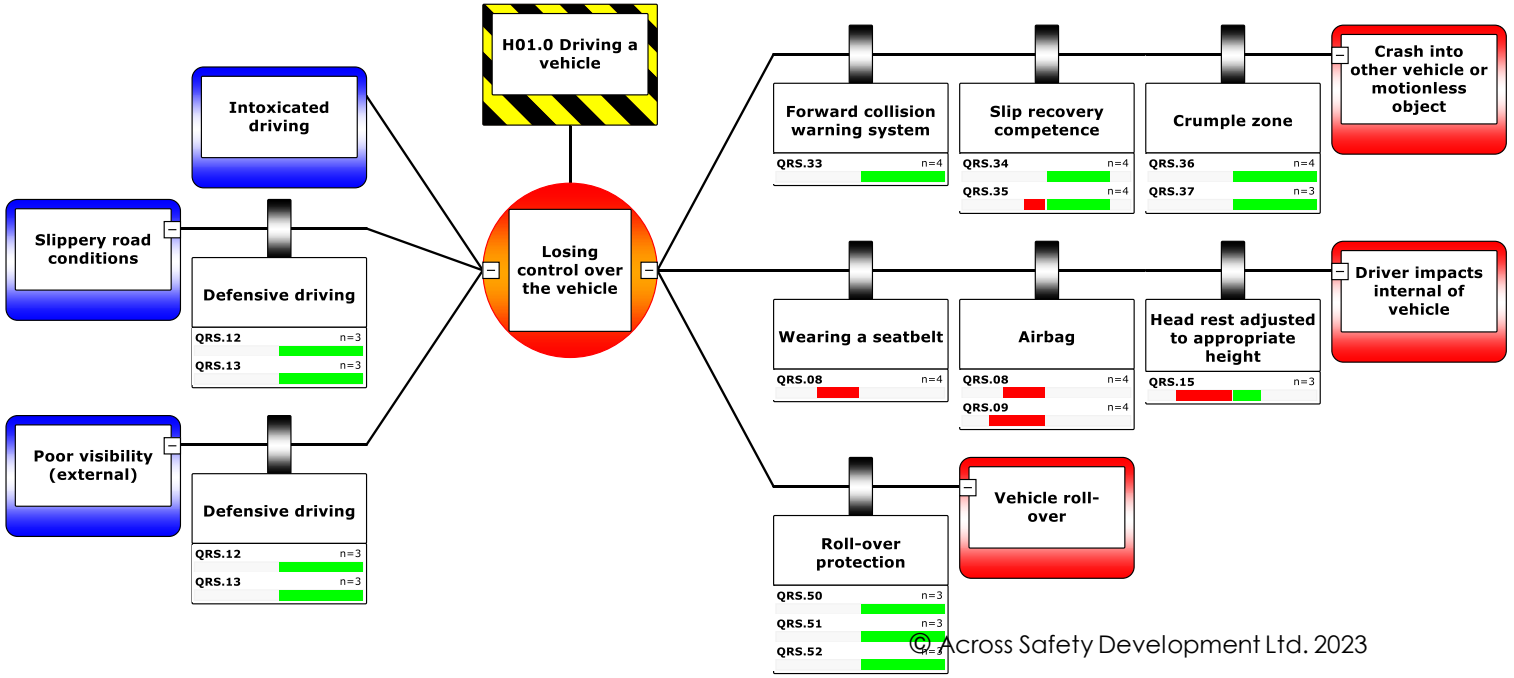
Where are your weaknesses?



Monitoring and review: SPIs

	A	B	C	D	E
1	**Risk**	**Threats**	**Consequences**	**Barriers**	**Risk level**
2	Driving a car / Losing control over the car	Intoxicated driving Slippery road conditions Poor visibility (external)	Crash into other car or motionless object Driver impacts Internal of car Vehicle roll-over	Airbag Crumple zone Defensive driving procedure Forward Colision Warning System Head rest adjustment to appropriate height Roll-over protection Seatbelt Slip recovery competence	**Med**

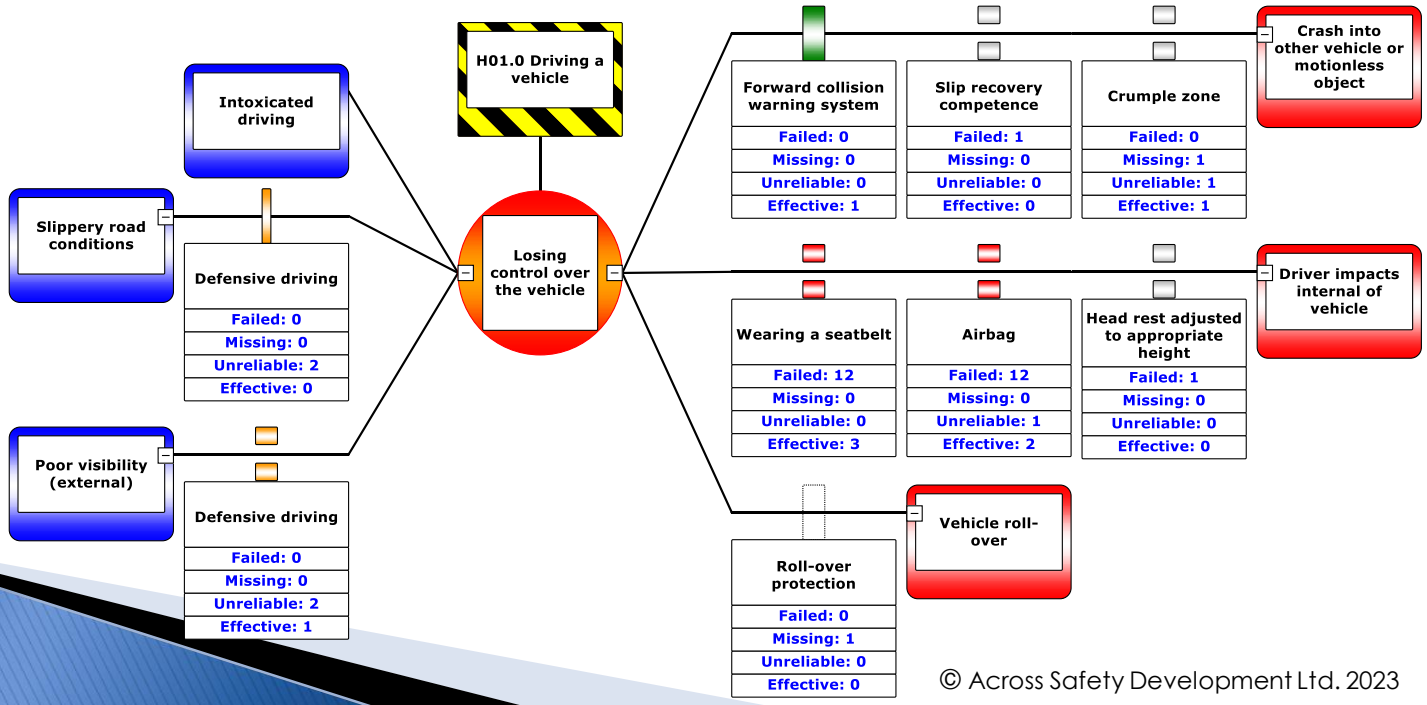
How do your SPIs interact with your risk assessments?



Monitoring and review: Investigations

	A	B	C	D	E
1	**Risk**	**Threats**	**Consequences**	**Barriers**	**Risk level**
2	Driving a car / Losing control over the car	Intoxicated driving Slippery road conditions Poor visibility (external)	Crash into other car or motionless object Driver impacts Internal of car Vehicle roll-over	Airbag Crumple zone Defensive driving procedure Forward Colision Warning System Head rest adjustment to appropriate height Roll-over protection Seatbelt Slip recovery competence	**Med**

How does your reactive data interact with your risk assessments?



BowTie Applications

- To **Structure Thinking**
- For **Decision Making**
- For **Communication** and **Collaboration**
- For **Monitoring** and **Review**

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Risk management consulting, training and software

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