Transportation Safety Board of Canada

Bureau de la sécurité des transports du Canada

Air Safety Issue Investigation A15H0001

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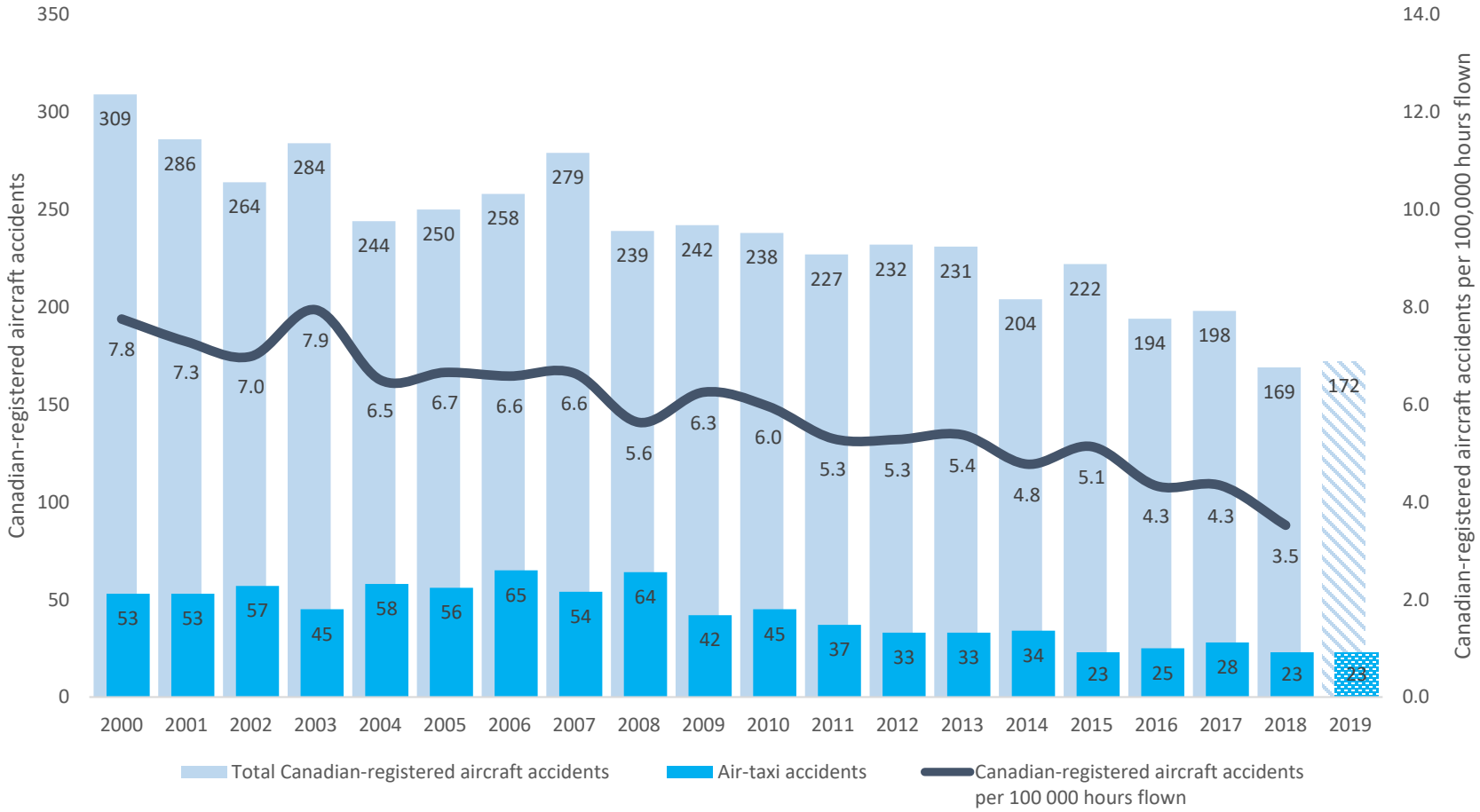
Chair, Transportation Safety Board of Canada

Canada

Outline

- Statistics and context: “It’s just different”
- Research questions and previous studies
- 19 safety themes
- Safe operating envelope
- 2 key factors
- Raising the bar
- TSB recommendations

A declining accident rate



Which sector has the most accidents?

Accidents and fatalities involving Canadian-registered aircraft, by operator type, 2000 to 2017

Context of air taxi operations in Canada

SII research questions

- What are the hazards and risk factors associated with air taxi operations in Canada?
- How are these being managed?
- What additional measures are needed to improve the safety of air taxi operations in Canada?

How the SII was conducted

- TSB data were restricted to the years 2000 to 2014 to ensure that only closed investigations and published investigation reports were used.

- Both quantitative and qualitative data were collected and analyzed for this study.

Industry consultations

- Interviews were conducted with personnel working at all levels of the companies in various capacities and in various kinds of operations:
  - single-pilot and multi-crew
  - aeroplane, floatplane, helicopter
  - visual flight rules, instrument flight rules
  - MEDEVAC
  - TC inspectors
- The interviews were used to augment the results of the analysis of the TSB data and the information on hazards, mitigations currently in place, and mitigations needed in the sector.

Accident types

Aeroplane accident types	Helicopter accident types
• VMC + Loss of Visual Reference + CFIT • VMC + Loss Visual Reference + LOC • Floatplane + LOC • Floatplane + Weight and Balance • ALA-Single pilot • ALA-Multi-crew • Icing • Risk of Collision/Mid-air collision • Maintenance-related • Manufacturing-related • Fuel-related • Takeoff condition • Exceptions* • Other*	• VMC + Loss of Visual Reference + CFIT • VMC + Loss Visual Reference + LOC • Aerodynamic effects on control + LOC • Risk of collision/Midair collision • Maintenance-related • Manufacturing-related • Training-related • Exceptions* • Other*

19 safety themes

- Aerodromes and infrastructure
- Availability of qualified personnel
- Collision avoidance
- Interruptions and distractions
- MEDEVAC operations
- Night operations
- On-board technology
- Survivability
- Weather information
- Acceptance of unsafe practices
- Fatigue
- Maintaining air-taxi aircraft
- Operational pressure
- Pilot decision-making (PDM) and crew resource management (CRM)
- Training of pilots and other flight operations personnel
- Training of aircraft maintenance engineers (AMEs)
- Safety management
- Regulatory framework
- Regulatory oversight

Safe operating envelope model

Safety pressures

- Pilot decision making and crew resource management
- Training of pilots and other flight operations personnel
- Training of aircraft maintenance engineers
- Safety management
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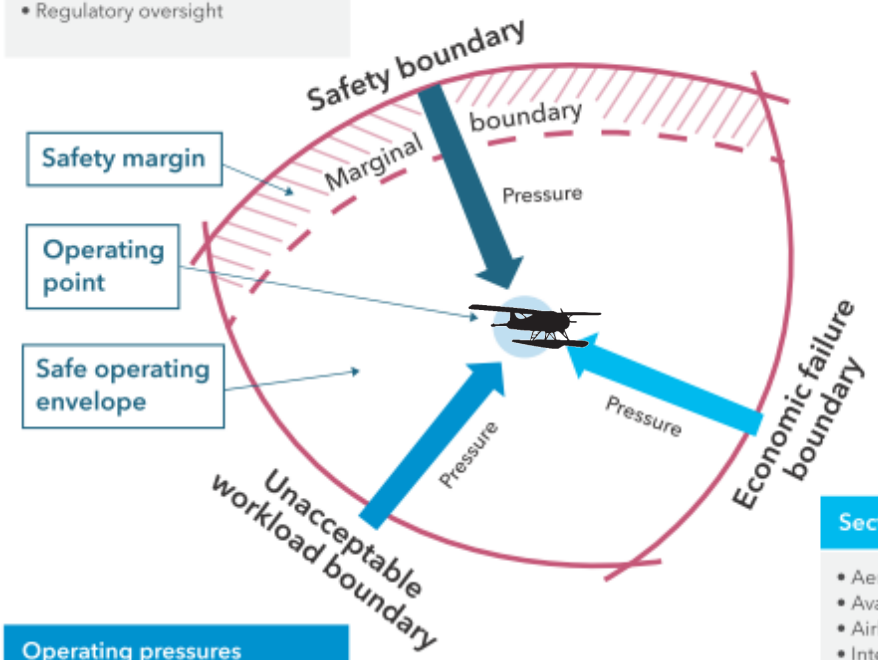


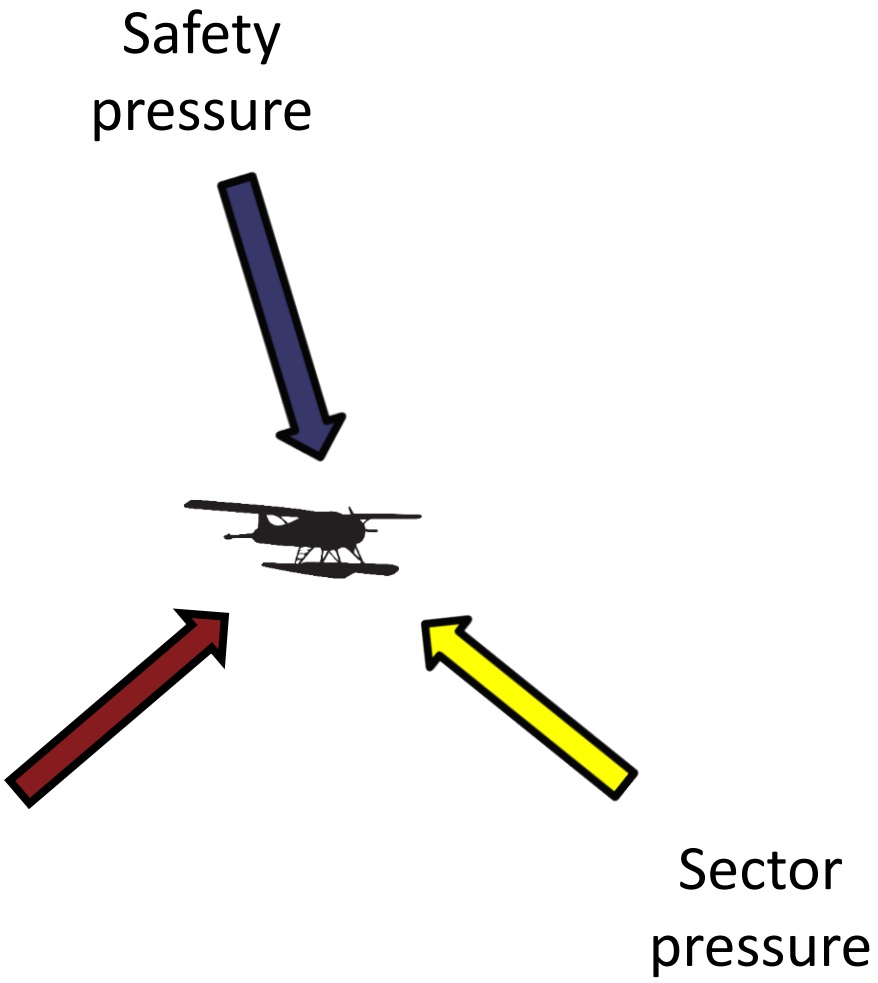
Operating pressures

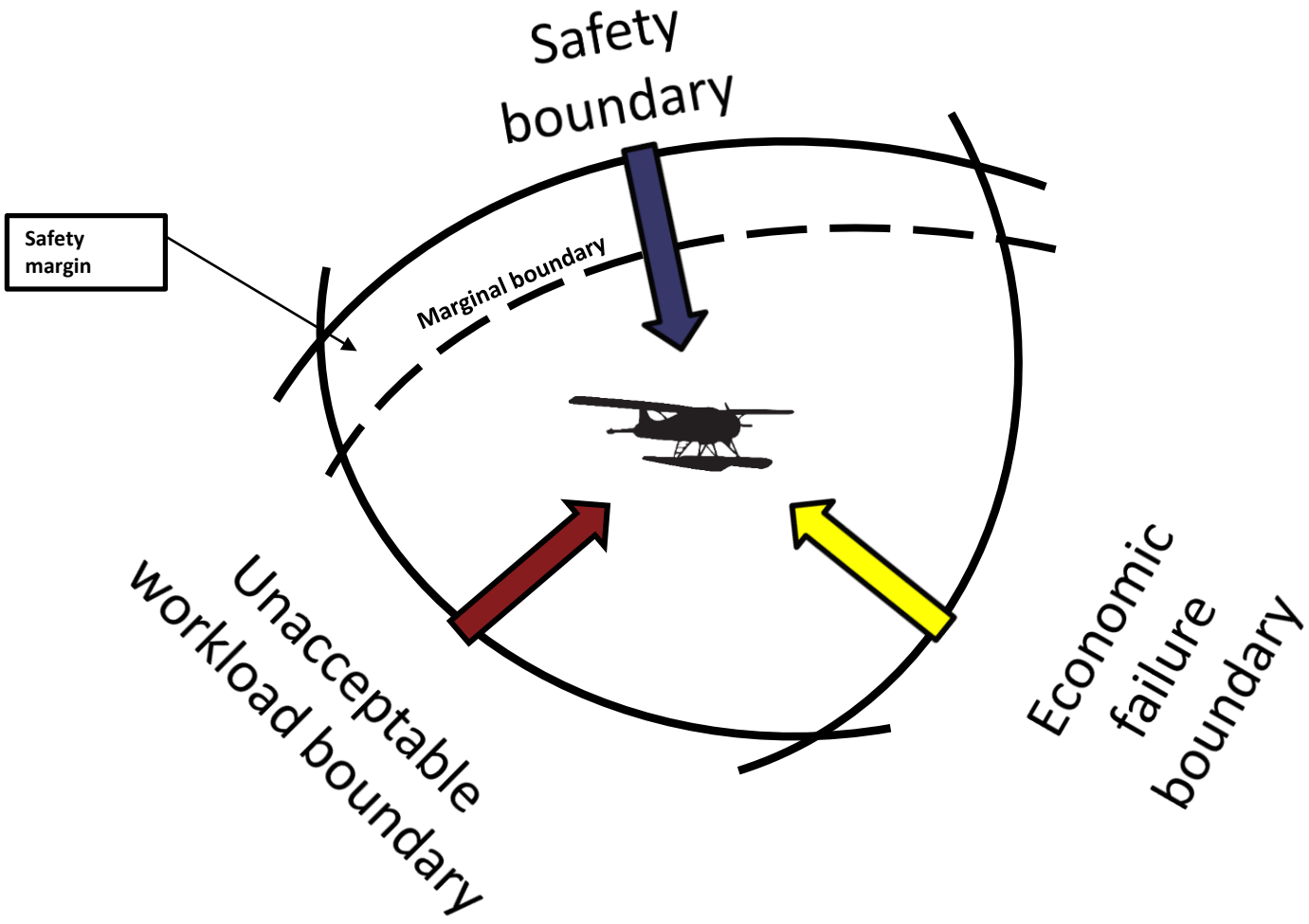
- Acceptance of unsafe practices
- Fatigue
- Maintaining air-taxi aircraft
- Operational pressure

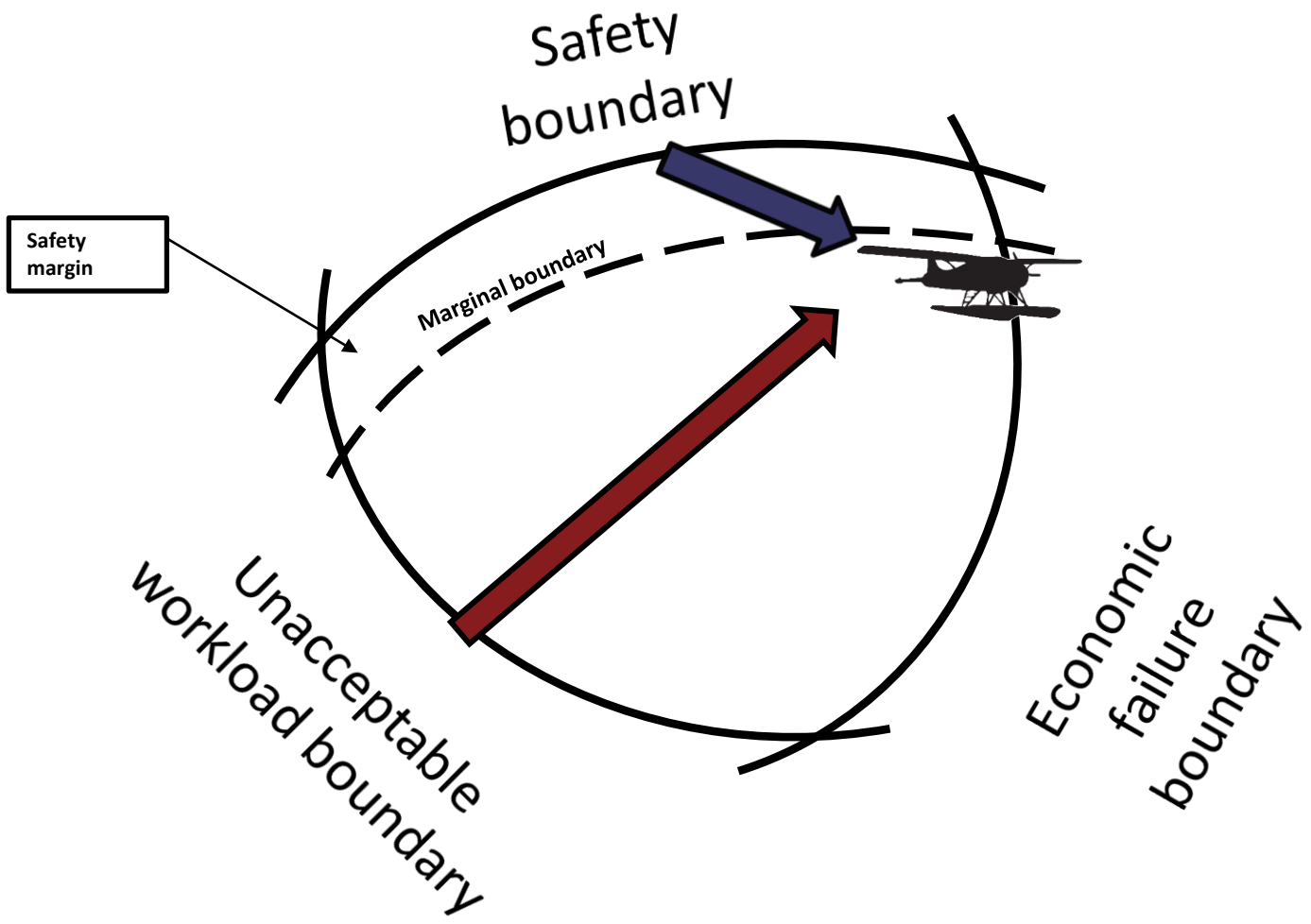
Sector pressures

- Aerodromes and infrastructure
- Availability of qualified personnel
- Airborne collision avoidance
- Interruptions and distractions
- MEDEVAC operations
- Night operations
- On-board technology
- Survivability
- Weather information

Safe operating envelope model




Safety boundary
Safety margin
Marginal boundary
Unacceptable workload boundary
Economic failure boundary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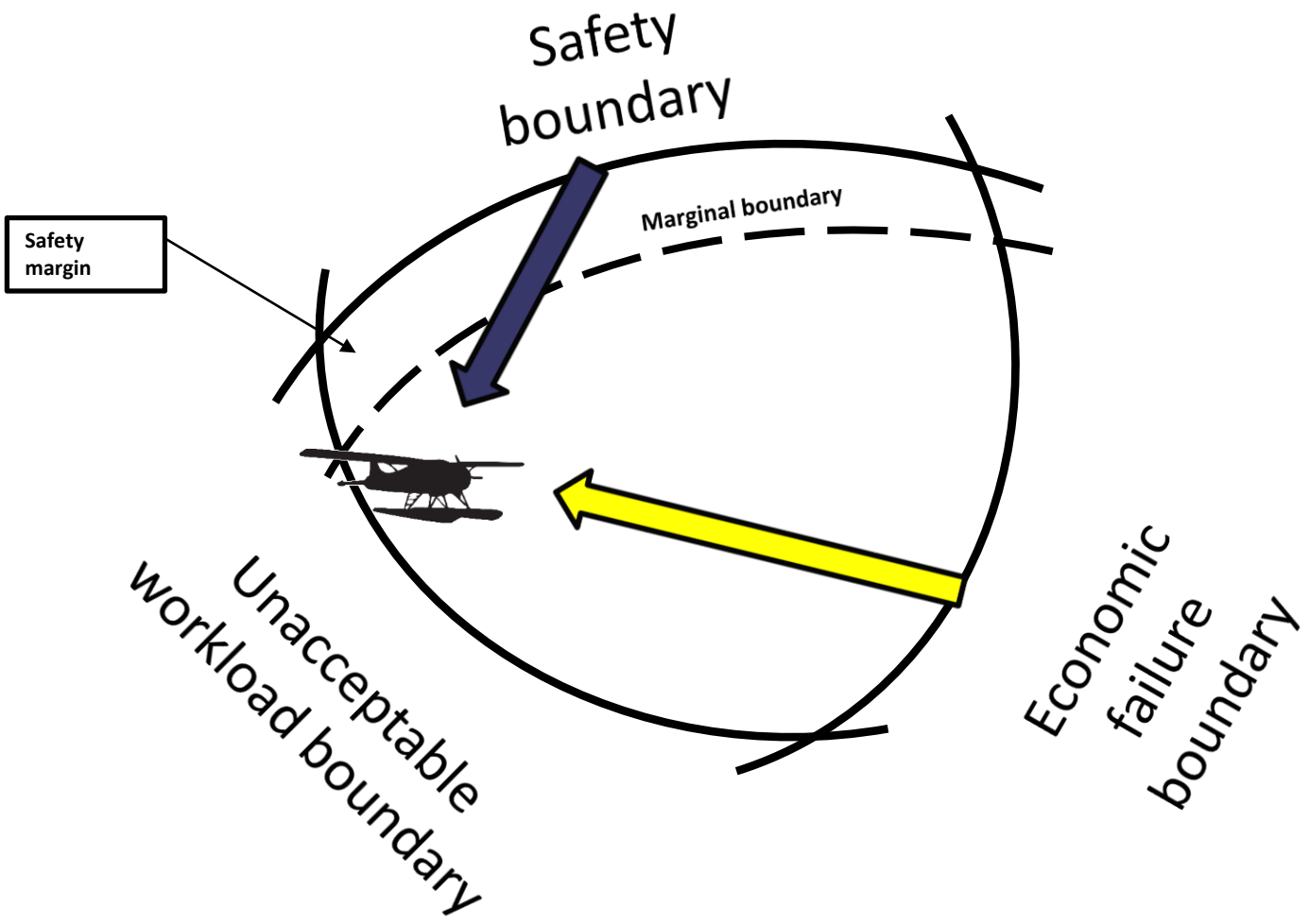
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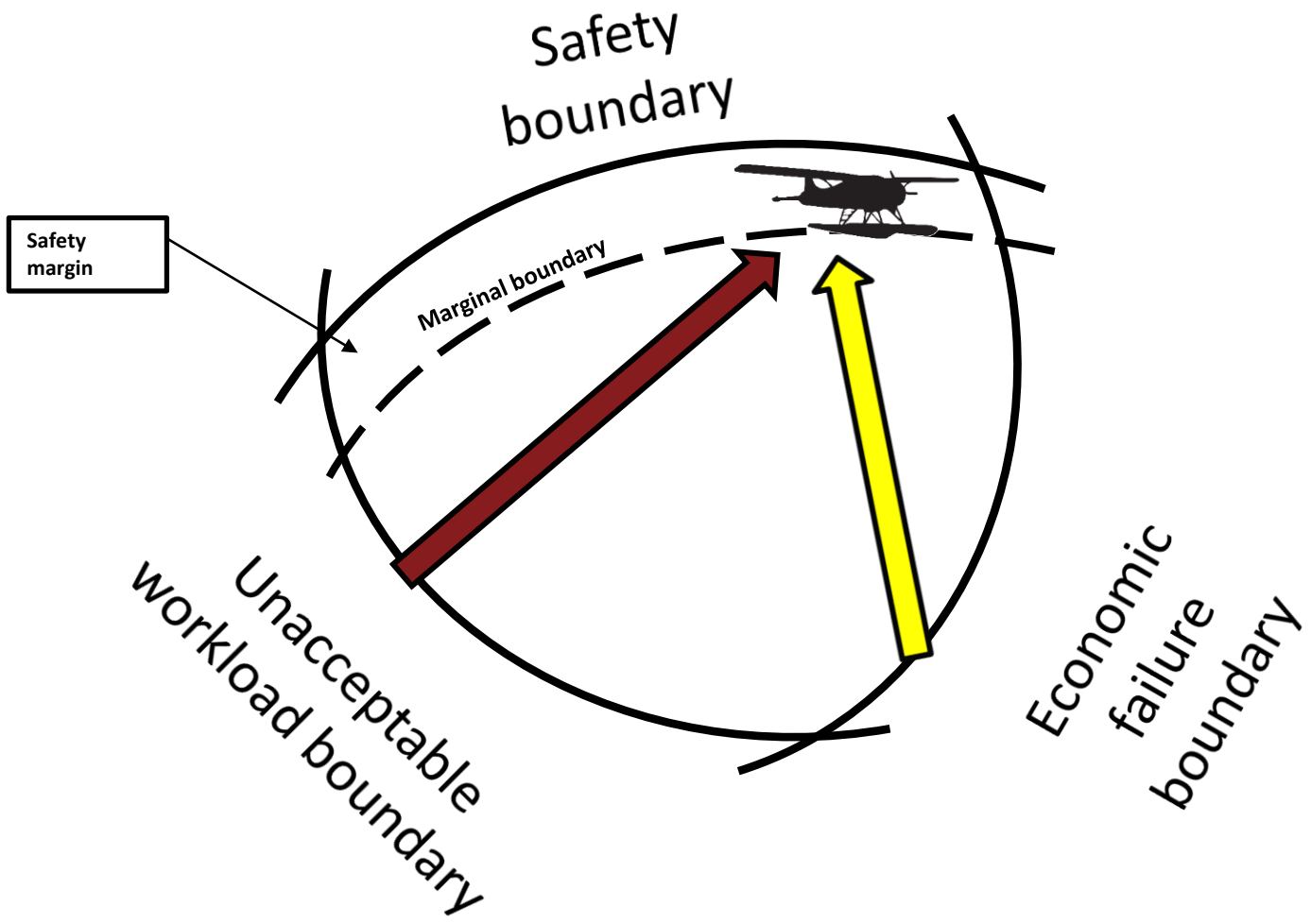
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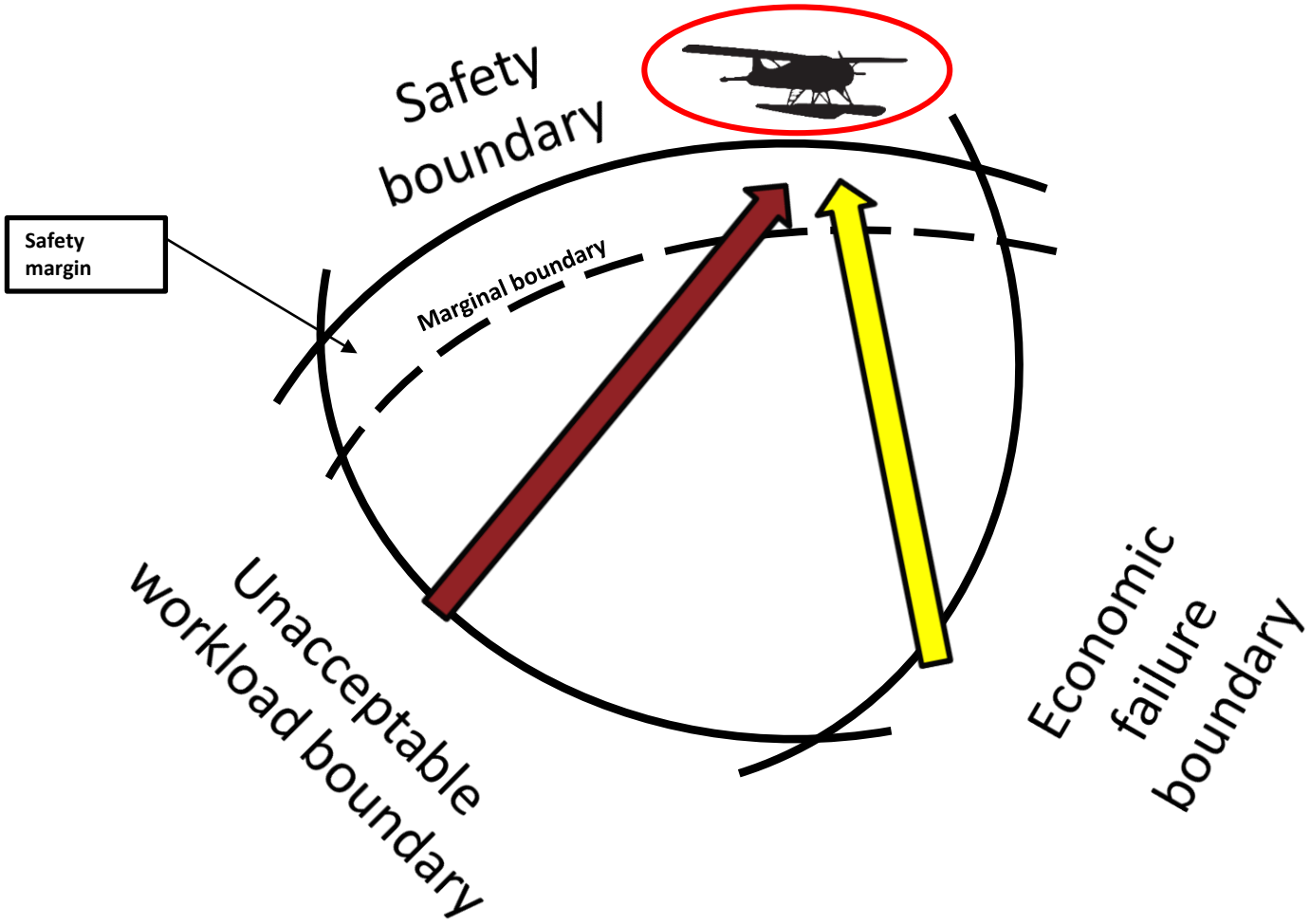
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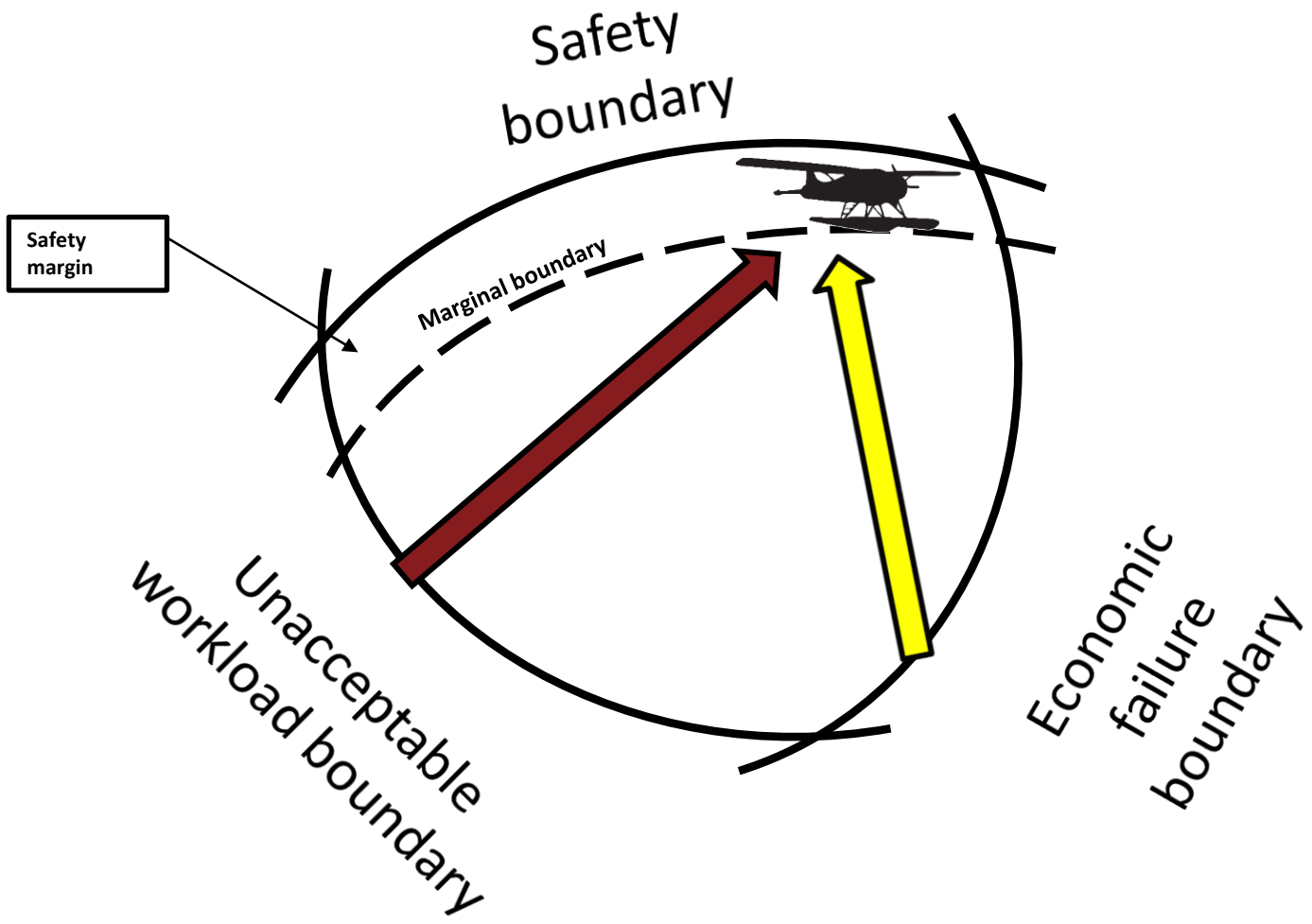
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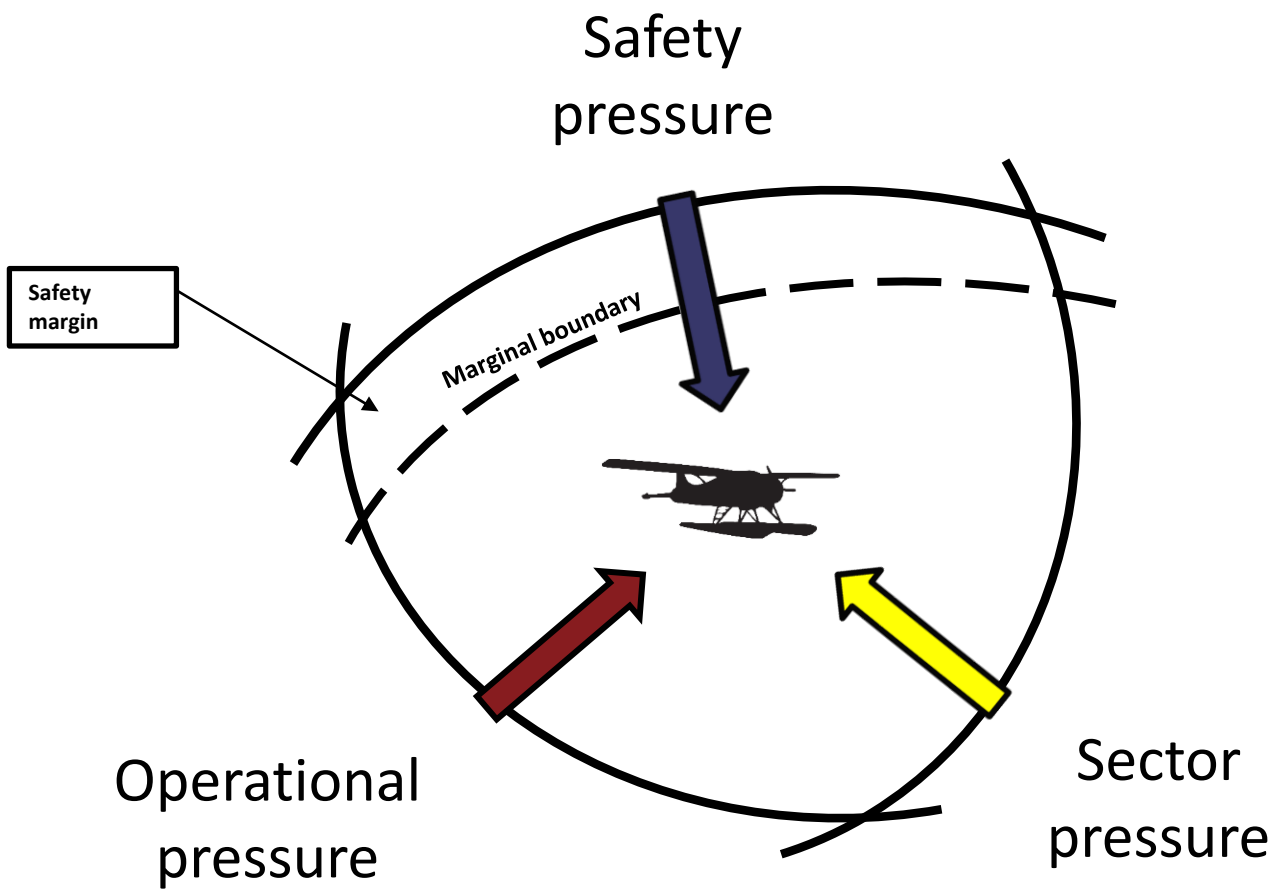

Safety pressure
Safety margin
Marginal boundary
Operational pressure
Sector pressure

Boiling it down: 2 key underlying factors

- **Acceptance of unsafe practices** (e.g., flying overweight, flying into forecasted icing, not recording defects in the aircraft log, flying with unserviceable equipment, "pushing the weather," and flying with minimal fuel reserves)

- **Inadequate management of operational hazards** (e.g., inadequate response to aircraft emergencies, inadequate crew coordination contributing to unstable approach, VFR flight at night, loss of visual reference in marginal weather conditions, scales not available for weight and balance calculations)

TSB Recommendation A19-02

"… the Department of Transport collaborate with industry associations to develop strategies, education products, and tools to help air-taxi operators and their clients eliminate the acceptance of unsafe practices."

– A19-02

TSB Recommendation A19-03

"… industry associations (e.g., ATAC, HAC, AQTA, FOA, NATA) promote proactive safety management processes and safety culture with air-taxi operators to address the safety deficiencies identified in this safety issue investigation through training and sharing of best practices, tools, and safety data specific to air-taxi operations."

– A19-03

TSB Recommendation A19-04

"… the Department of Transport review the gaps identified in this safety issue investigation regarding Subpart 703 of the Canadian Aviation Regulations and associated standards, and update the relevant regulations and standards."

– A19-04

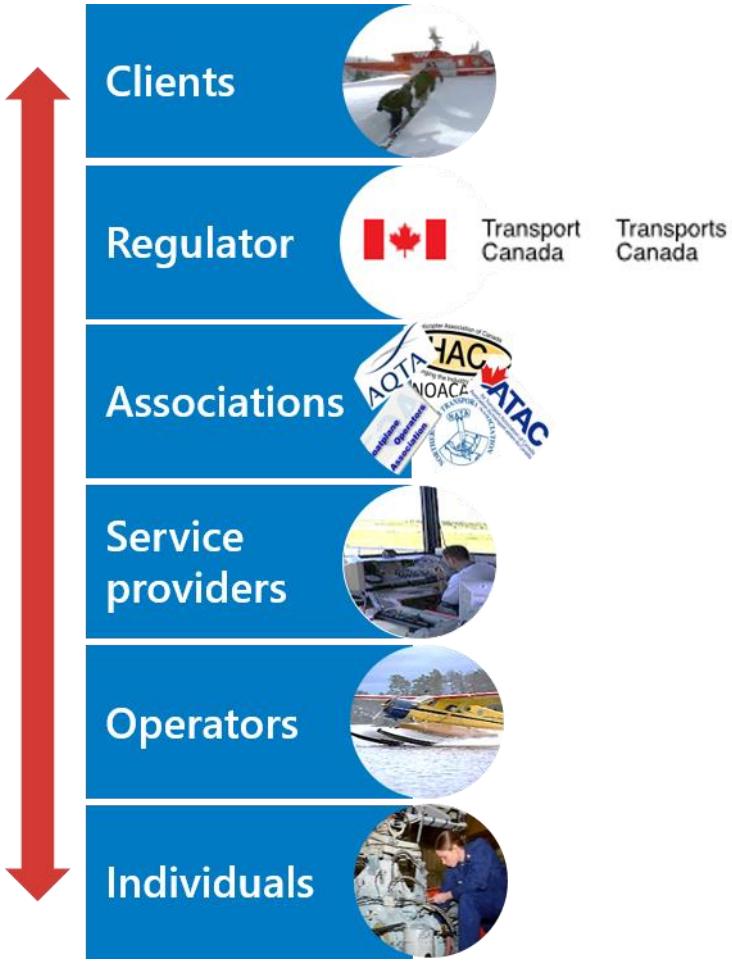
TSB Recommendation A19-05

" … the Department of Transport require all commercial operators to collect and report hours flown and movement data for their aircraft by Canadian Aviation Regulations subpart and aircraft type, and that the Department of Transport publish those data."

– A19-05

Going forward

It will take effort from ***all stakeholders*** in the air-taxi industry to increase safety and reduce risk



Conclusions

- Operational context matters: it's an inherent part of the accident risk
- No single issue is the problem
- 2 key underlying factors:
  - Acceptance of unsafe practices
  - Inadequate management of operational hazards
- 4 new recommendations

QUESTIONS?

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