



Do You Understand the Risks to Your Operation?

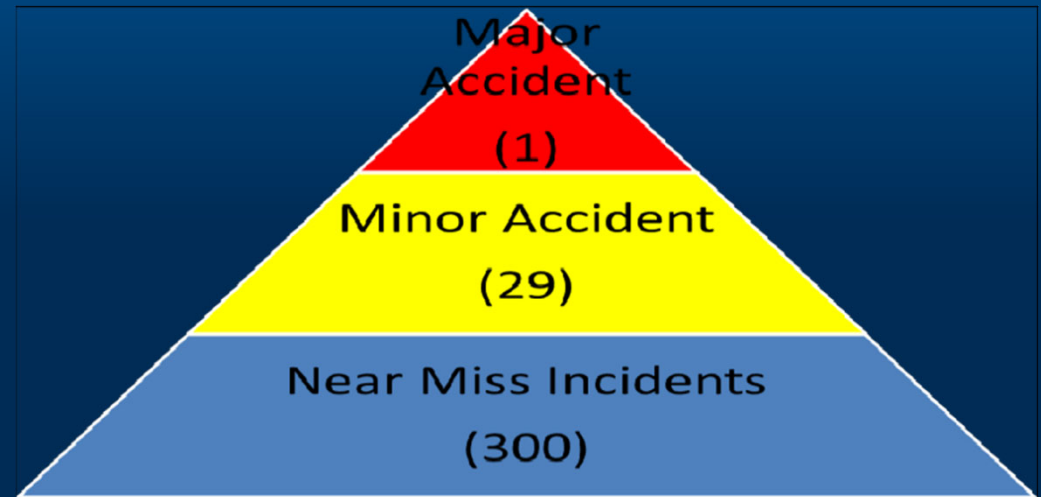
Member Michael Graham

Understanding Your Risks

- Do you know and understand the risks of your operation?
- Decisions made every day impact your operation's margin of safety
- Failing to identify previously unknown risks and mitigate the risks known to the operation increases the likelihood of an accident
- Case study demonstrating how an operator failed to understand the risk of its operation which led to a preventable accident

Heinrich's Triangle

- Near misses happen at every operation, but without employee reporting and data capture, you will not know about them until it's a major accident
- If you do not understand the incidents and close calls, you will not be able to prevent the major accident



Three Questions

1. What are the risks to your operation?
2. How do you know?
3. Have you mitigated the known risks?

Iceberg of Ignorance

- 4% problems known to upper management
- 9% problems known to middle management
- 74% problems known to supervisors
- 100% problems known to rank and file and file employees

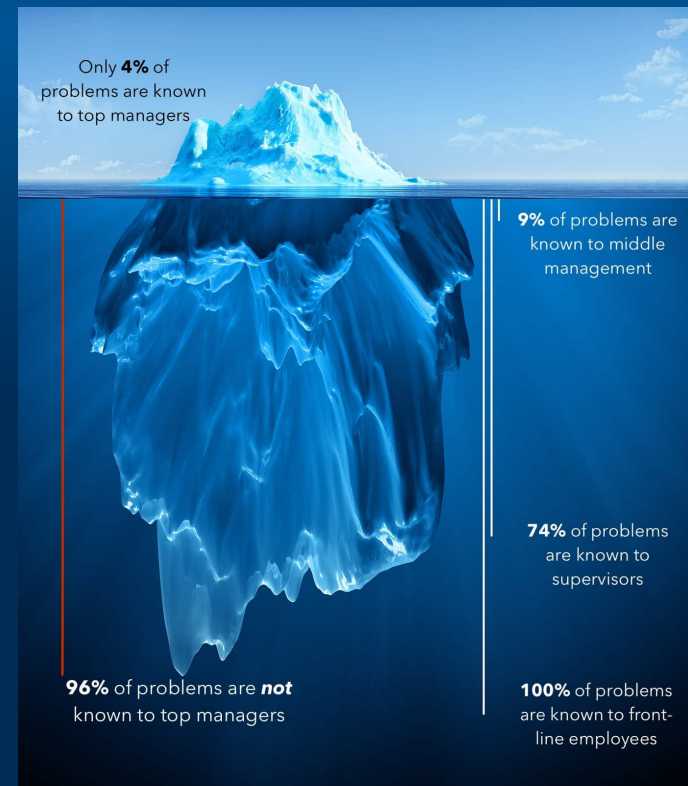


Image Source: <https://bobbyalbert.com/iceberg-of-ignorance/>

Credit to Sidney Yoshida who popularized the concept in 1989



Collision into Terrain Safari Aviation Inc. Airbus AS350 B2, N985SA

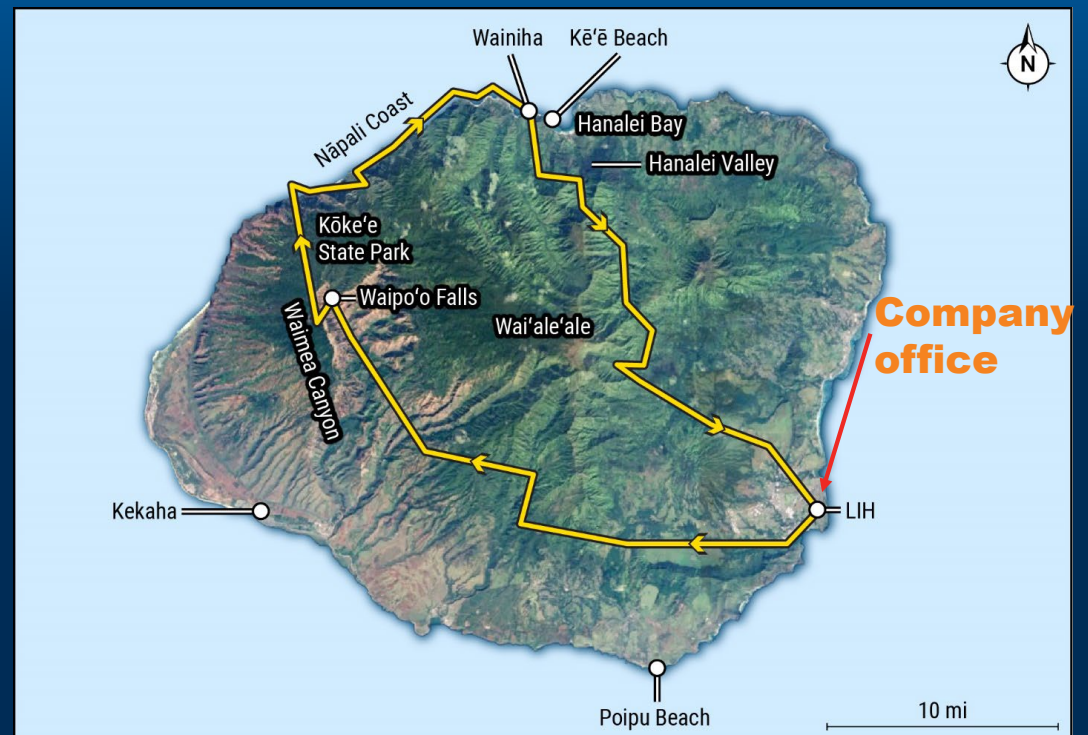
Kekaha, Hawaii

December 26, 2019



Initial Information

- December 26, 2019
- Kekaha, HI
- Airbus AS350 B2 helicopter
- Safari Aviation Inc.
- Chief pilot
- Final tour of the day
- Departed LIH at 4:31pm

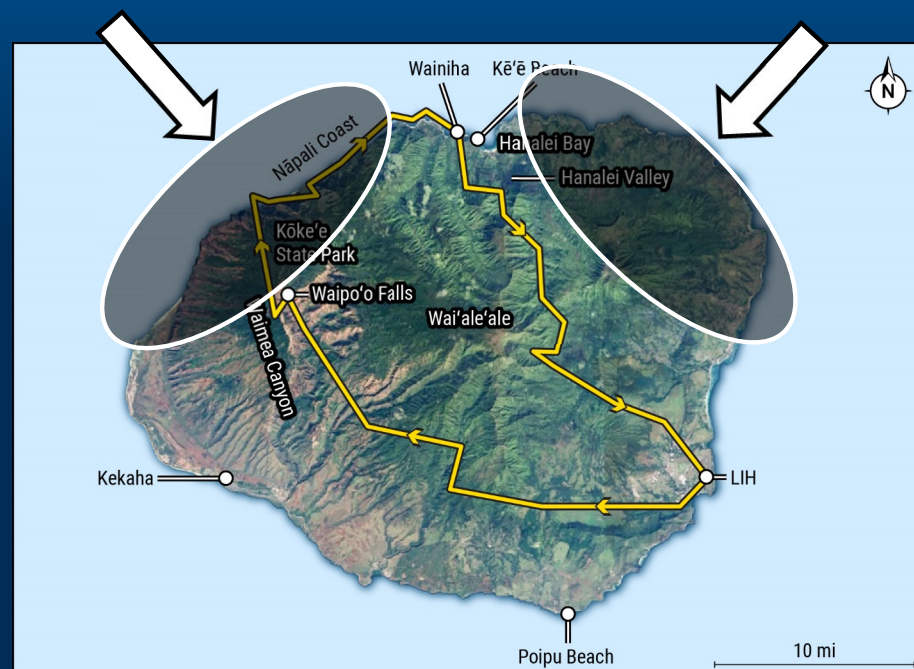


Atypical Weather Pattern

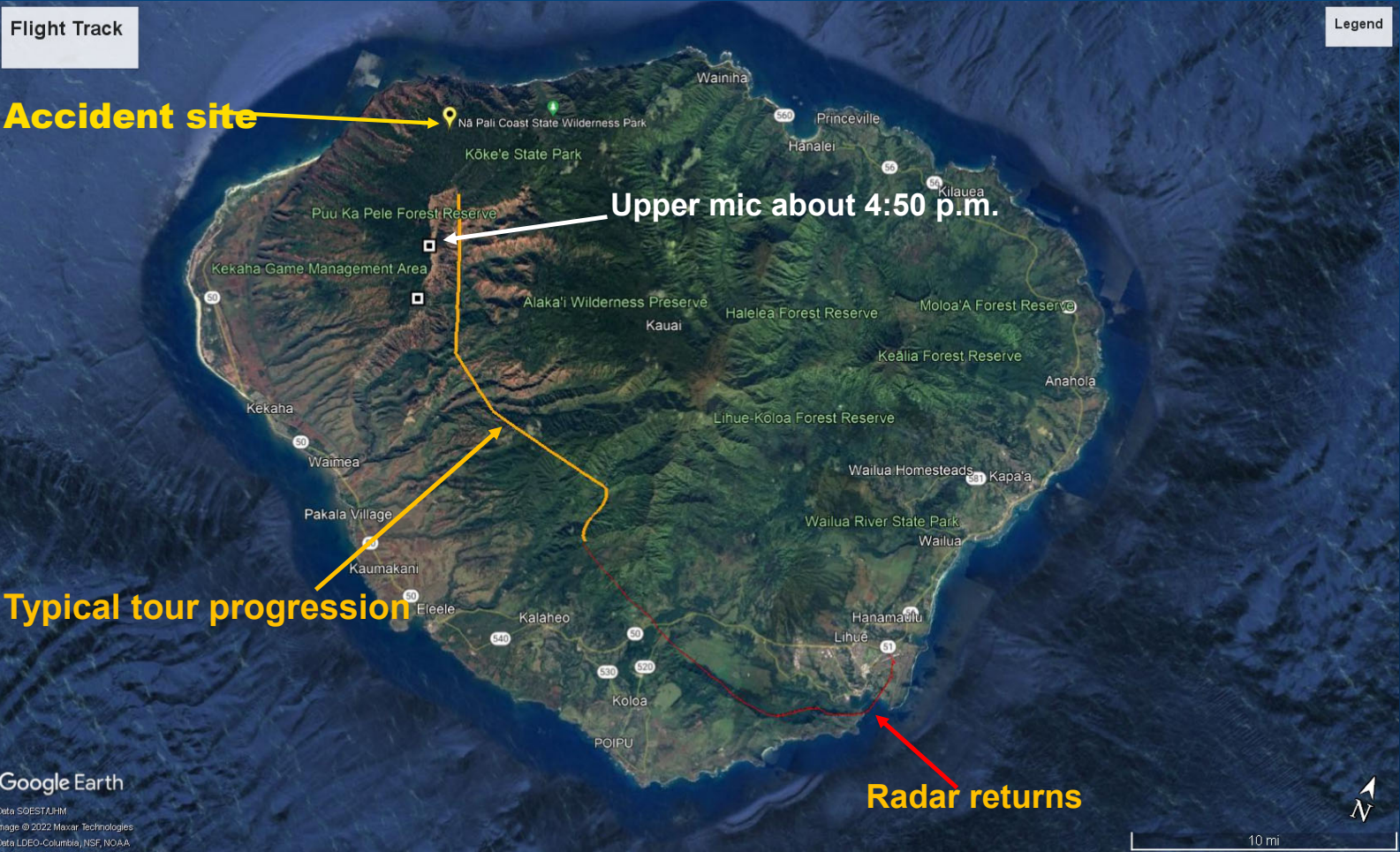
- Northeast trade winds normally bring clouds and rain to northeast Kauai
- On afternoon of accident, northwest winds brought clouds and rain to northwest side
- Atypical weather pattern

Clouds and rain
(Time of accident)

Clouds and rain
(Normal pattern)



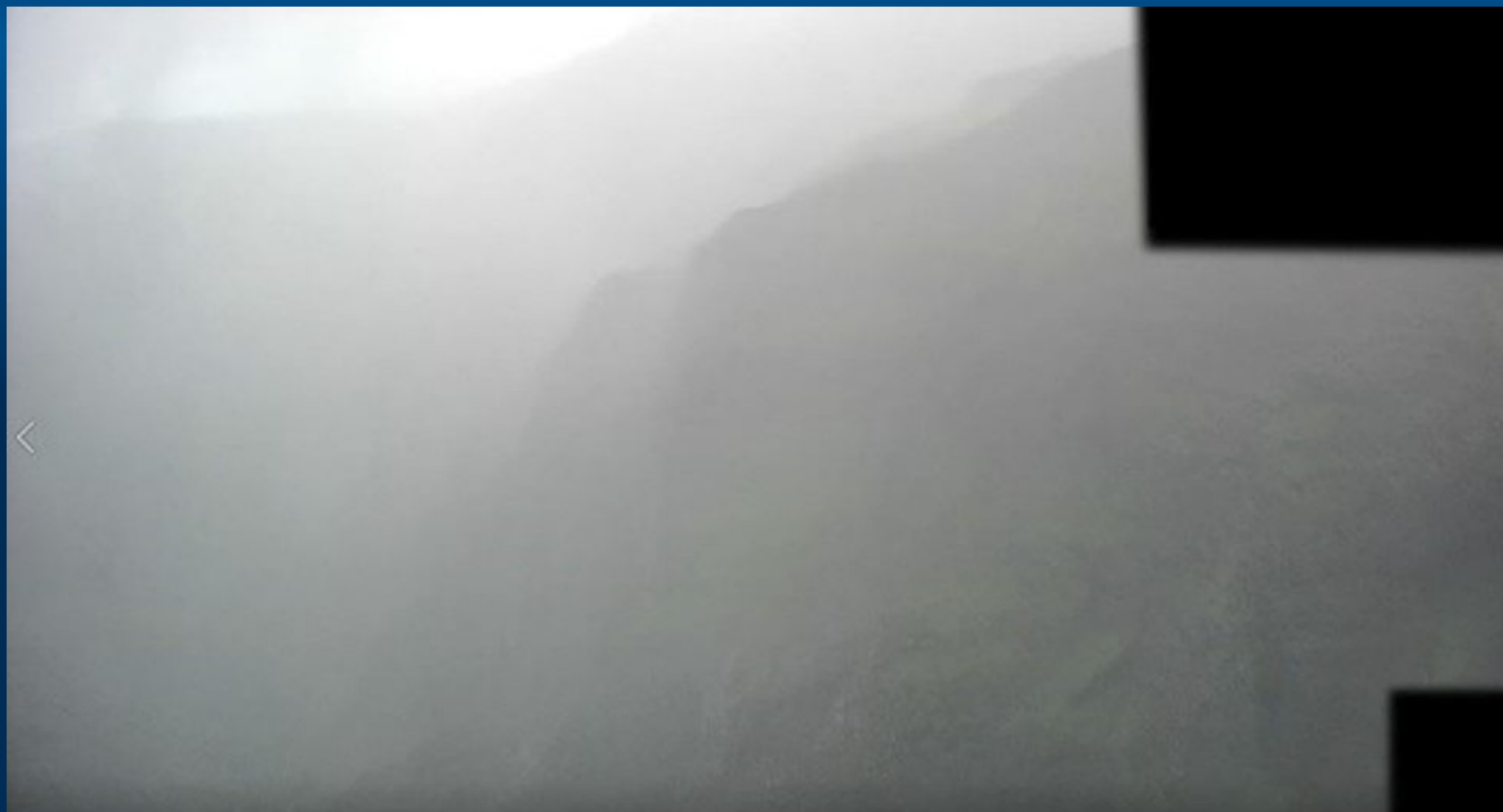
Accident Flight



Conditions in North Waimea Canyon (4:27 pm) about 23 Minutes before
Accident Flight Arrived (Company 1 Tour)

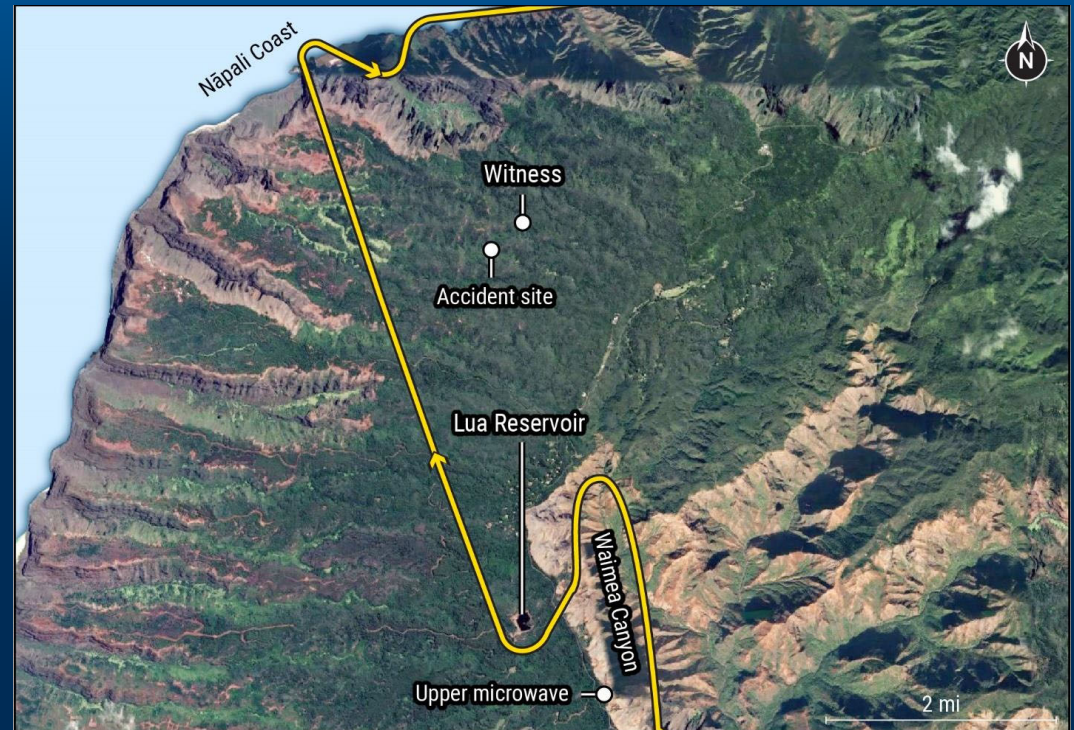


Conditions in North End of Waimea Canyon
about 4:57 p.m. (Company 2 Tour)



Accident Site

- Witness on hiking trail
- Heavy rain between 4:00 and 4:45 p.m.
- Dense fog with about 20 ft visibility
- Heard helicopter for about 30 to 50 seconds
- 4:57 p.m. Hawaii standard time
- Collided into terrain about 11 miles north of Kekaha, Hawaii
- Pilot and six passengers fatally injured



Accident Site



NTSB Finding

The accident pilot continued the tour flight into an area of deteriorating weather until he encountered instrument meteorological conditions and lost adequate visual references.

Procedural Drift

- Policy:
 - HATCM: Minimum altitude of 500ft agl, 3 miles visibility
- Practice:
 - Pilot encountered instrument meteorological conditions
 - NTSB Finding: Considering that at least three other tour flights entered reduced visibility conditions on the day of the accident, it is possible that procedural drift toward risky weather-related operating practices existed among pilots of the local air tour community.



Discovering Procedural Drift

- Reactive
 - After an incident
- Proactive
 - Systematic searching for deviations within your organization
 - Auditing/internal evaluations/assessments
 - Employee Reporting
 - Safety Management System
- Predictive
 - Flight Data Monitoring
 - Data capture allows operators to understand the conditions likely to lead to procedural drift

Safety Management Systems

- NTSB Recommendation A-16-36: To the FAA: Require all 14 Code of Federal Regulations Part 135 operators to establish safety management system programs
 - Reiterated recommendation seven times
- FAA initiated rulemaking project but has yet to issue an NPRM
- NTSB recommendation remains Open-Unacceptable until final rule is issued

Concerns from Small Operators

- Safari Aviation: 26 employees, 6 pilots, 4 aircraft
- Why didn't Safari Aviation have an SMS?
 - "Due to the size and scope of [the] company" – Safari's President & Director of Operations
- FAA Voluntary SMS Program as of February 2022
 - 1,940 certificate holders
 - 30 with an FAA-accepted SMS
 - 165 others have begun the process

Safari – SMS Scalability

Hazard Identification

- Flight Risk Assessments:
 - Safari: *“Nobody else has actual knowledge or visual reference to anything at that point in time; only the pilot will know what’s going on after the first weather brief[ing] he gets in the morning”*
- Incident Reporting:
 - Safari: Neither of the two pilots interviewed were aware of a company safety reporting system—despite the President & DO claiming there was mandatory incident reporting

Safety Assurance

- Onboard Camera Review:
 - Safari: Chief pilot would review, *“only if he found that another safari pilot was using excess fuel, hotdogging, or pulling excess power”*
 - Front desk review

SMS Scalability – Findings & Recommendations

- NTSB Findings:
 - The safety of all air tour operations, regardless of size, would be enhanced by the implementation of a safety management system.
 - A flight data monitoring program, which can enable an operator to identify and mitigate factors that may influence pilots' deviations from safe operating procedures can be particularly beneficial for operators like Safari Aviation Inc. that conduct single-pilot operations and have little opportunity to directly observe their pilots.
 - The recording and routine review of onboard videos could enable operators to identify instances where their pilots encountered reduced-visibility weather conditions or descended below Federal Aviation Administration-required minimum altitudes
- NTSB Recommendations:
 - To the FAA: Develop and distribute guidance to small operators for scaling an effective SMS
 - To the FAA: Issue safety alert for tour operators to review onboard cameras as part of a safety assurance process



- Require and Verify the Effectiveness of Safety Management Systems in all Revenue Passenger-Carrying Aviation Operations
- Install Crash-Resistant Recorders and Establish Flight Data Monitoring Programs
- Implement a Comprehensive Strategy to Eliminate Speeding-Related Crashes
- Protect Vulnerable Road Users through a Safe System Approach
- Prevent Alcohol- and Other Drug-Impaired Driving
- Require Collision-Avoidance and Connected-Vehicle Technologies on all Vehicles
- Eliminate Distracted Driving
- Improve Passenger and Fishing Vessel Safety
- Improve Pipeline Leak Detection and Mitigation
- Improve Rail Worker Safety

Understanding Your Risks

- Do you know and understand the risks of your operation?
- Decisions made every day impact your operation's margin of safety
- Failing to identify previously unknown risks and mitigate the risks known to the operation increases the likelihood of an accident
- SMS Scalability – It doesn't need to be complicated!

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