



Update on FRMS and the New CARs

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Agenda

The new CARs and the Performance Based Compliance Option

What is FRMS? What is a Safety Case?

Challenges

Successes

Where do we go from here?

Q&A

The New CARs and the Performance Based Compliance Option

Amendments	Previous limits	Limits in Amendment			
1. Maximum Flight Time	<ul style="list-style-type: none"> • 40–60 hours / 7 days • 120 hours / 30 days • 300 hours / 90 days • 1 200 hours / 365 days 	<ul style="list-style-type: none"> • 112 hours / 28 days • 300 hours / 90 days • 1 000 hours / 365 days 			
2. Maximum FDP	<ul style="list-style-type: none"> • 13 hours 45 minutes or 14 hours 	<ul style="list-style-type: none"> • Maximum 9–13 hours — based on start time of day and the sectors flown 			
3. Maximum Number of Hours of Work					
3(a) Maximum Number of Hours of Work	Nil		Hours Per 7 days	Hours Per 28 days	Hours Per 365 days
		Option 1	60	192	2 200
		Option 2	70	192	2 200
3(b) Time Free From Duty	<ul style="list-style-type: none"> — 36 hours / 7 days; or — 3 days / 17 days; or — 3 periods × 24 hours / 30 days — 13 × 24 hours / 90 days. 	Option 1	<ul style="list-style-type: none"> 1 single day free from duty per 7 days 4 single days free from duty per 28 days 		
		Option 2	5 days off per 21 days		
4. Rest Periods	8 hours plus time for travel, meals and hygiene	<p>At home — 12 hours or 11 hours plus travel time, or 10 hours in suitable accommodation provided by the air operator</p> <p>Away from home — 10 hours in suitable accommodation</p>			

Two Approaches to Compliance

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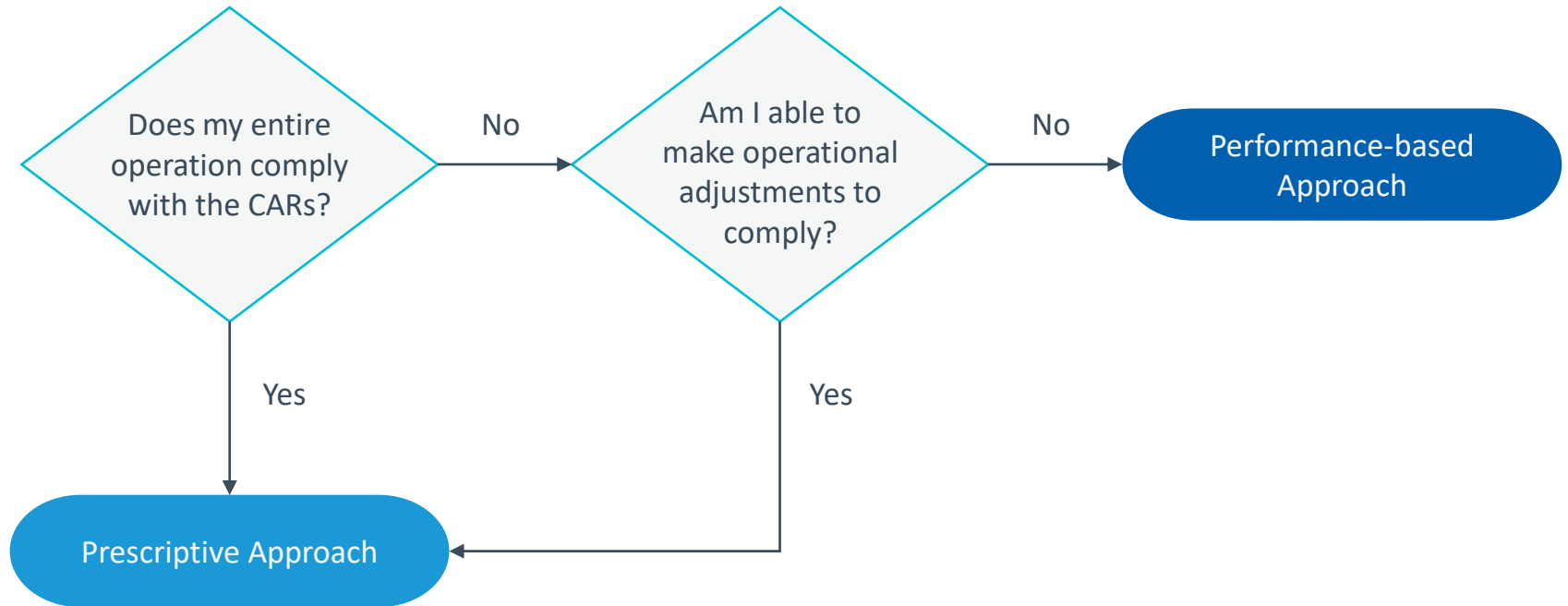
Prescriptive Approach

Fatigue Risk Management System



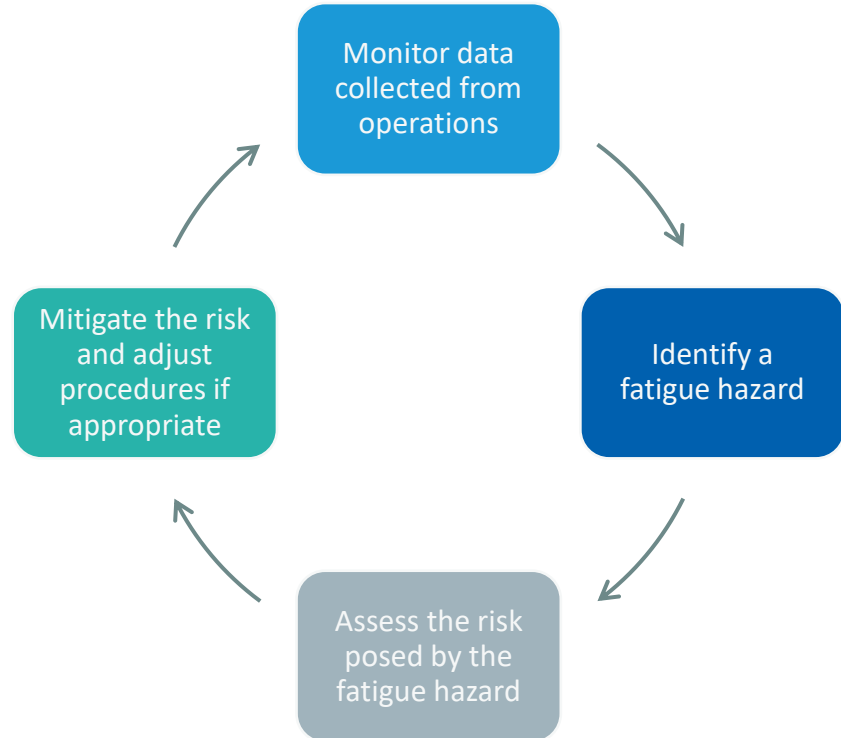
Performance-based Approach

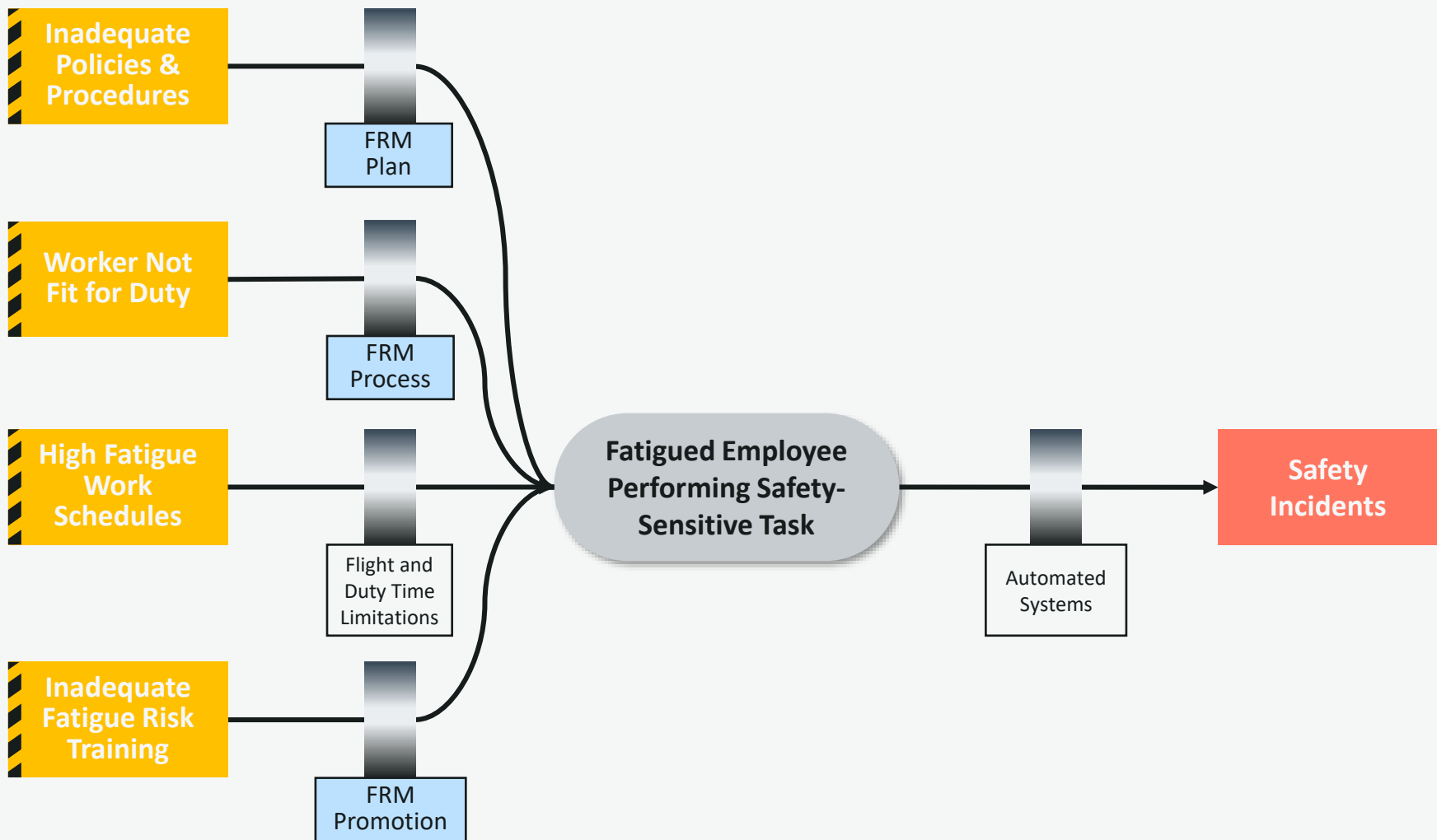
Which Approach Should I Take?

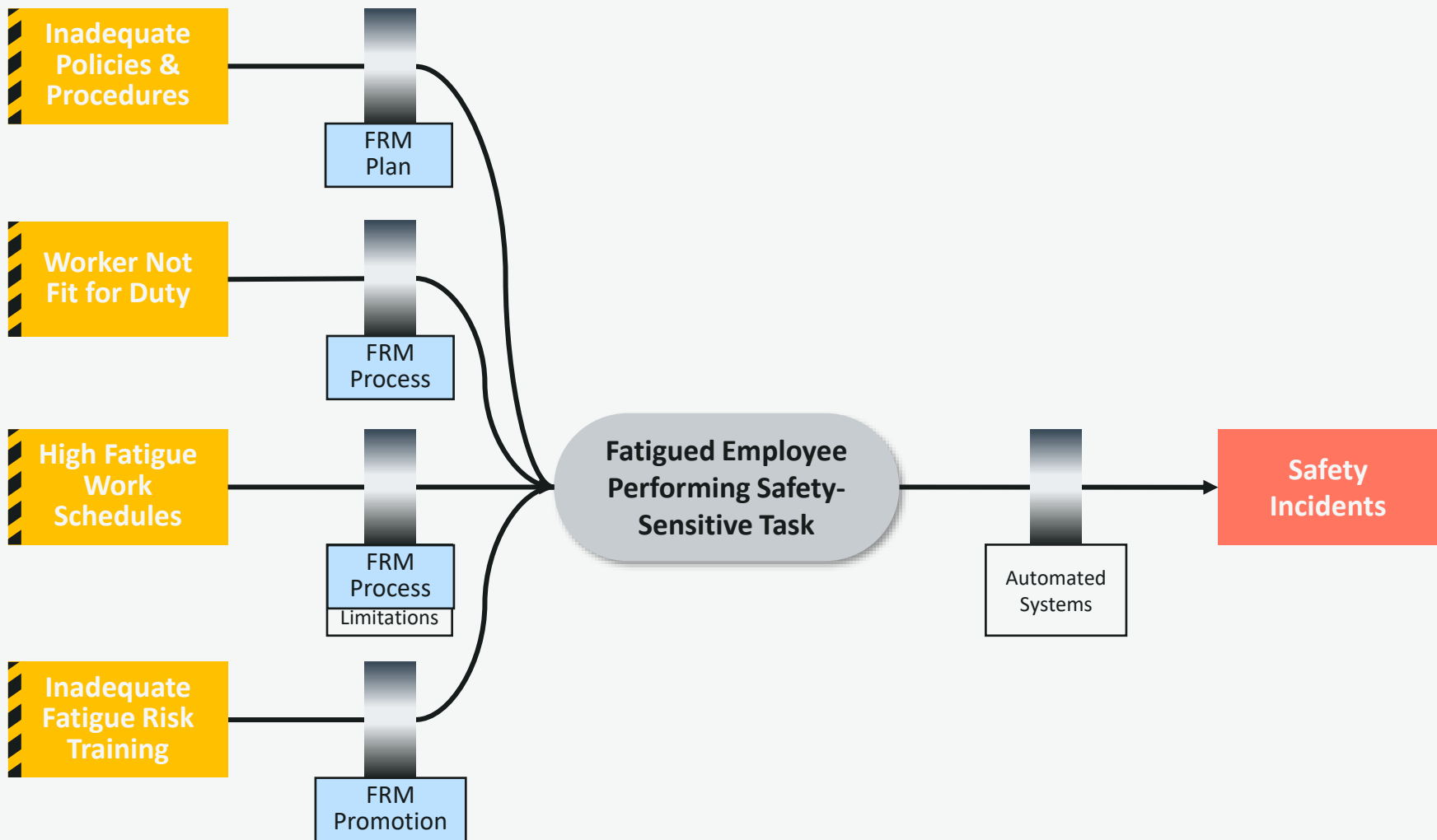


What is an FRMS? What is a Safety Case?

Fatigue Risk Management System







Understanding the Meaning of “Safety Case”

Safety Case: an **Argument For**



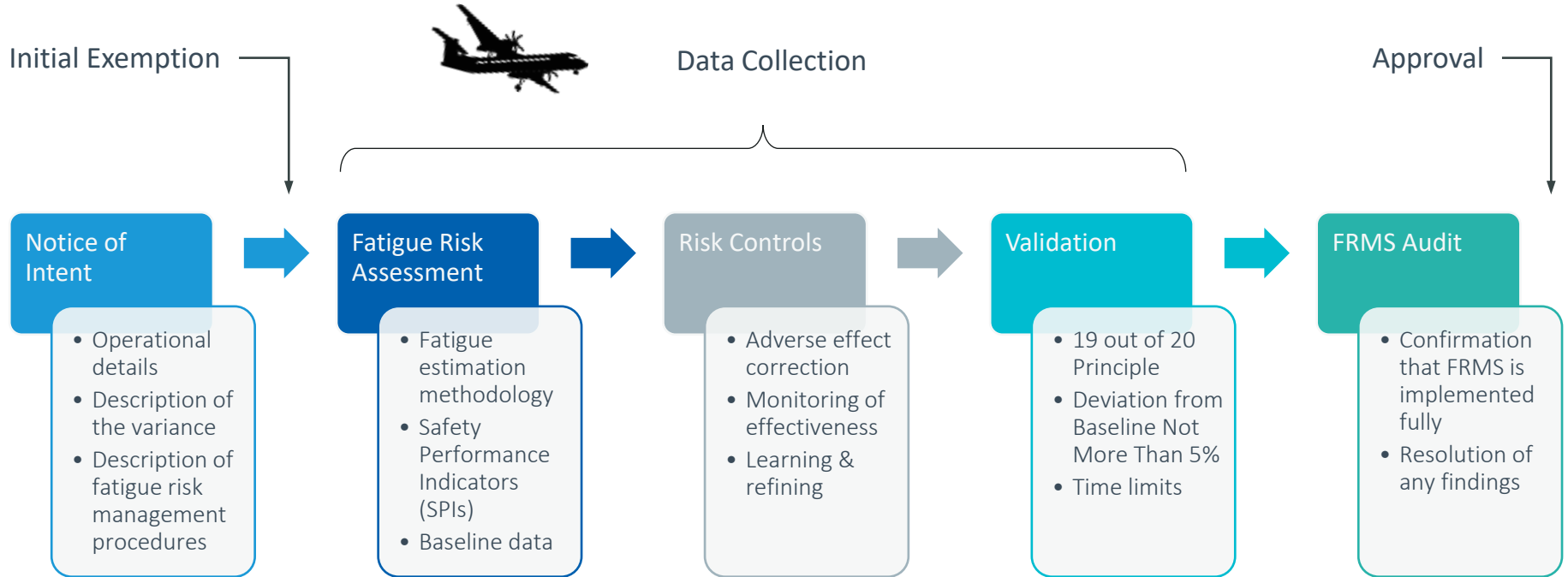
Safety Case: a **Process**



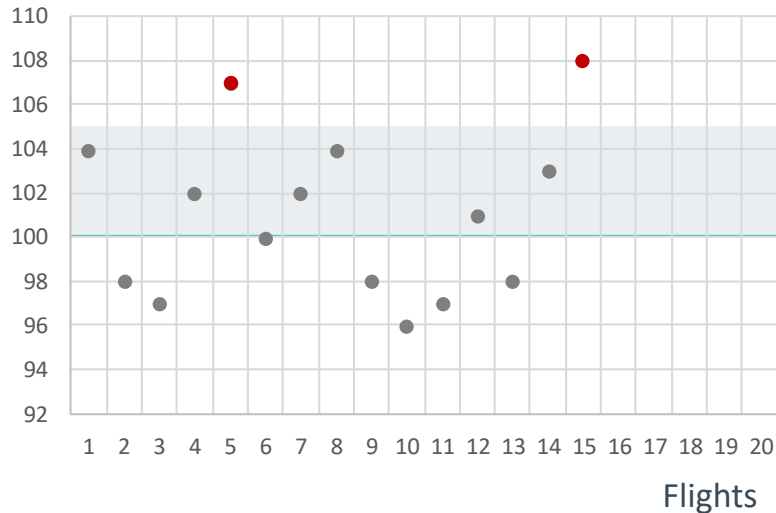
Safety Case: a **Filing**



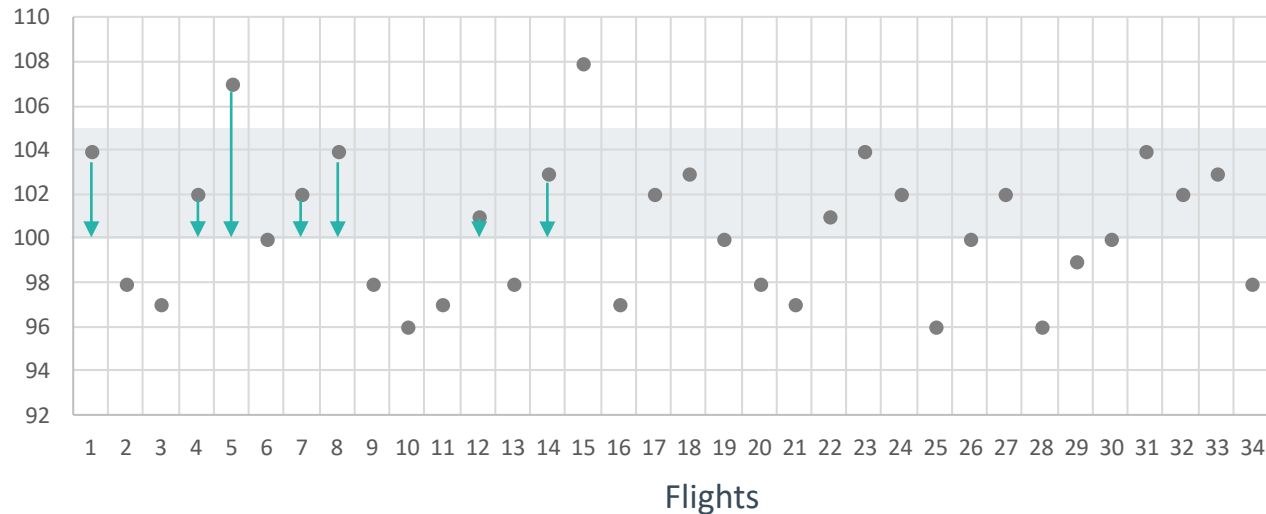
Safety Case: the Process



- In order to be validated, a safety case must provide evidence that “flights” conducted under the exemption do not exceed the baseline fatigue level by **more than 5%**, 19 times out of 20



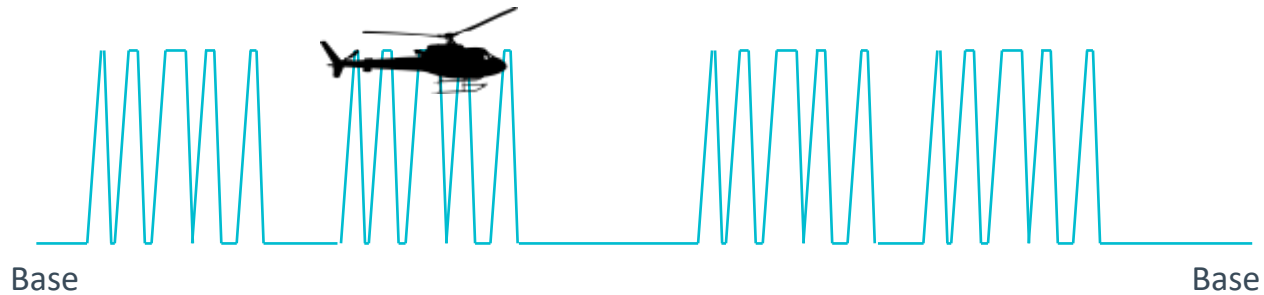
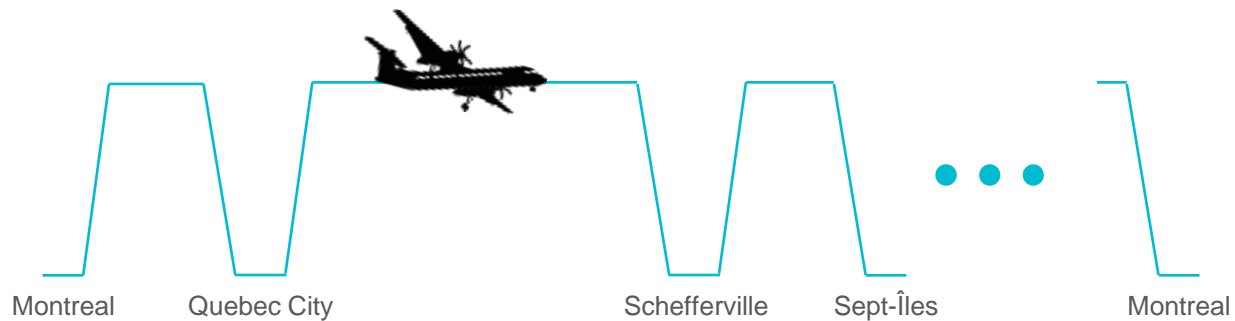
- Requirement is that 20 consecutive “flights” have at most one exceedance
- As soon as a second flight exhibits fatigue levels that exceed baseline by **more than 5%**, need data for at least 19 additional flights



Adverse effect mitigation
using risk controls

Challenges

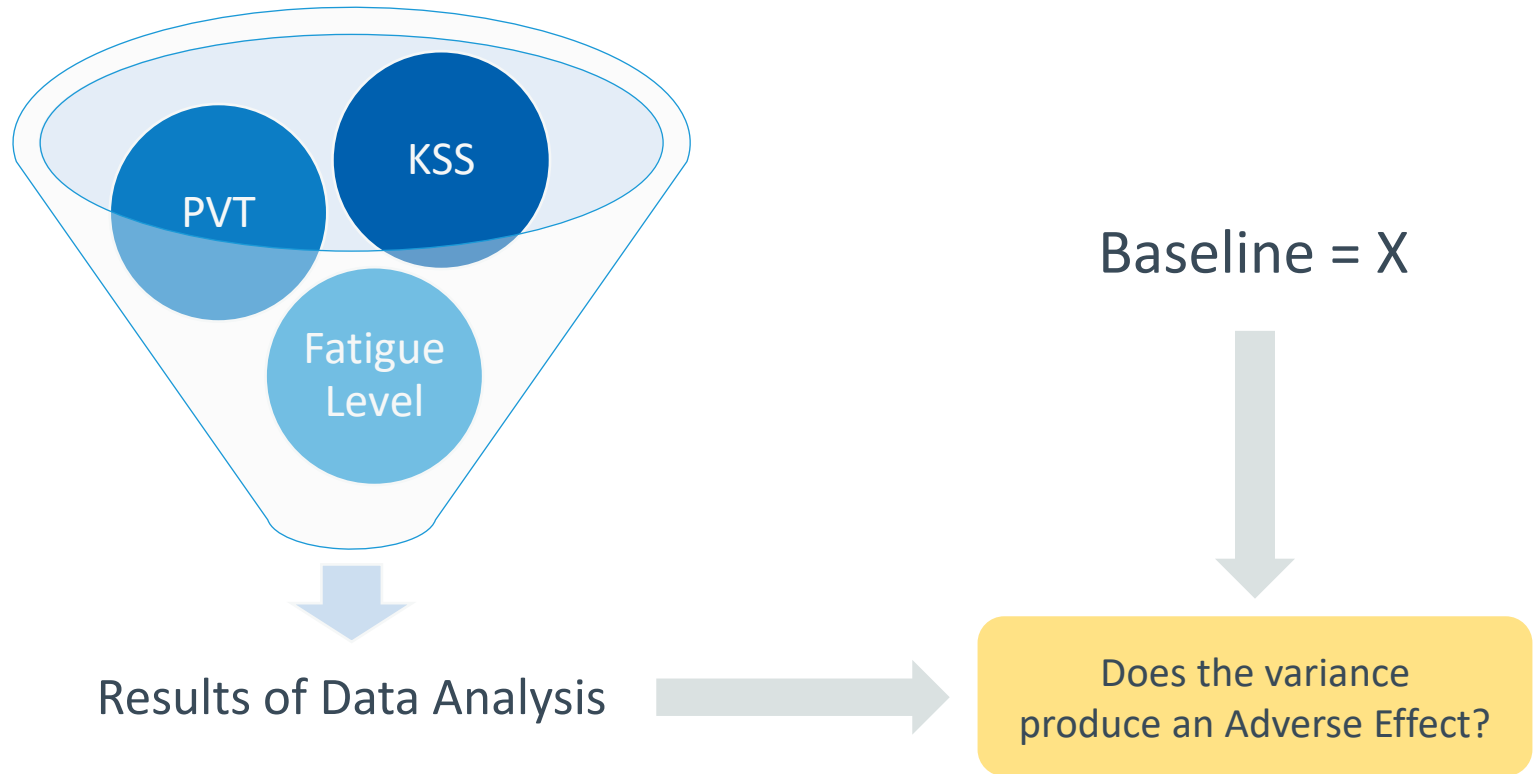
Definition of the word “flight”



Transport Canada Preparedness

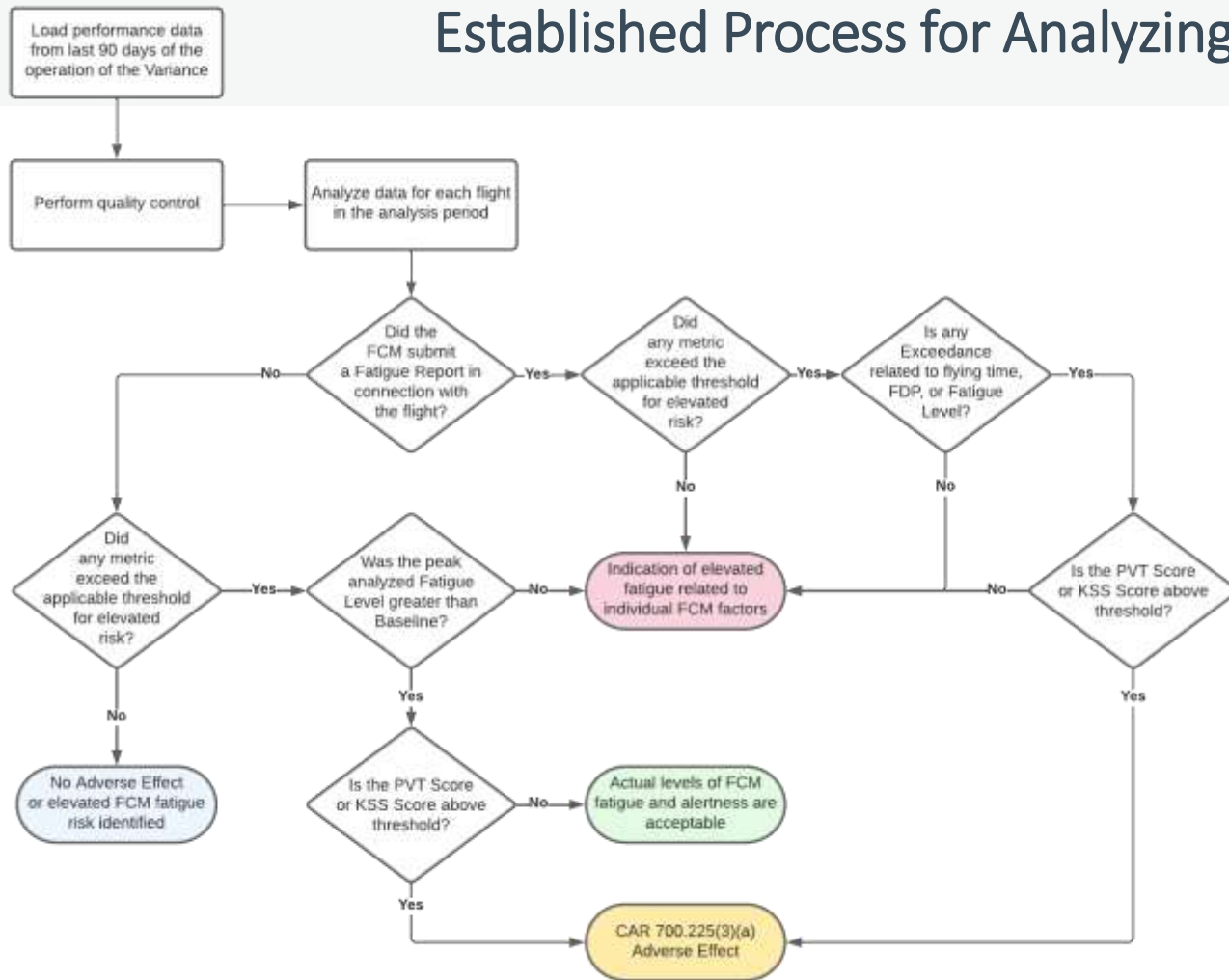
- Response time to NOI filings was supposed to be 10 calendar days
- Some POIs are offering their own judgements; others send everything back to Ottawa (Standards Branch)
- Difficulty connecting with the right people
- Changes in personnel sometimes result in changes in interpretation

“Conversion Method” between collected data and Baseline

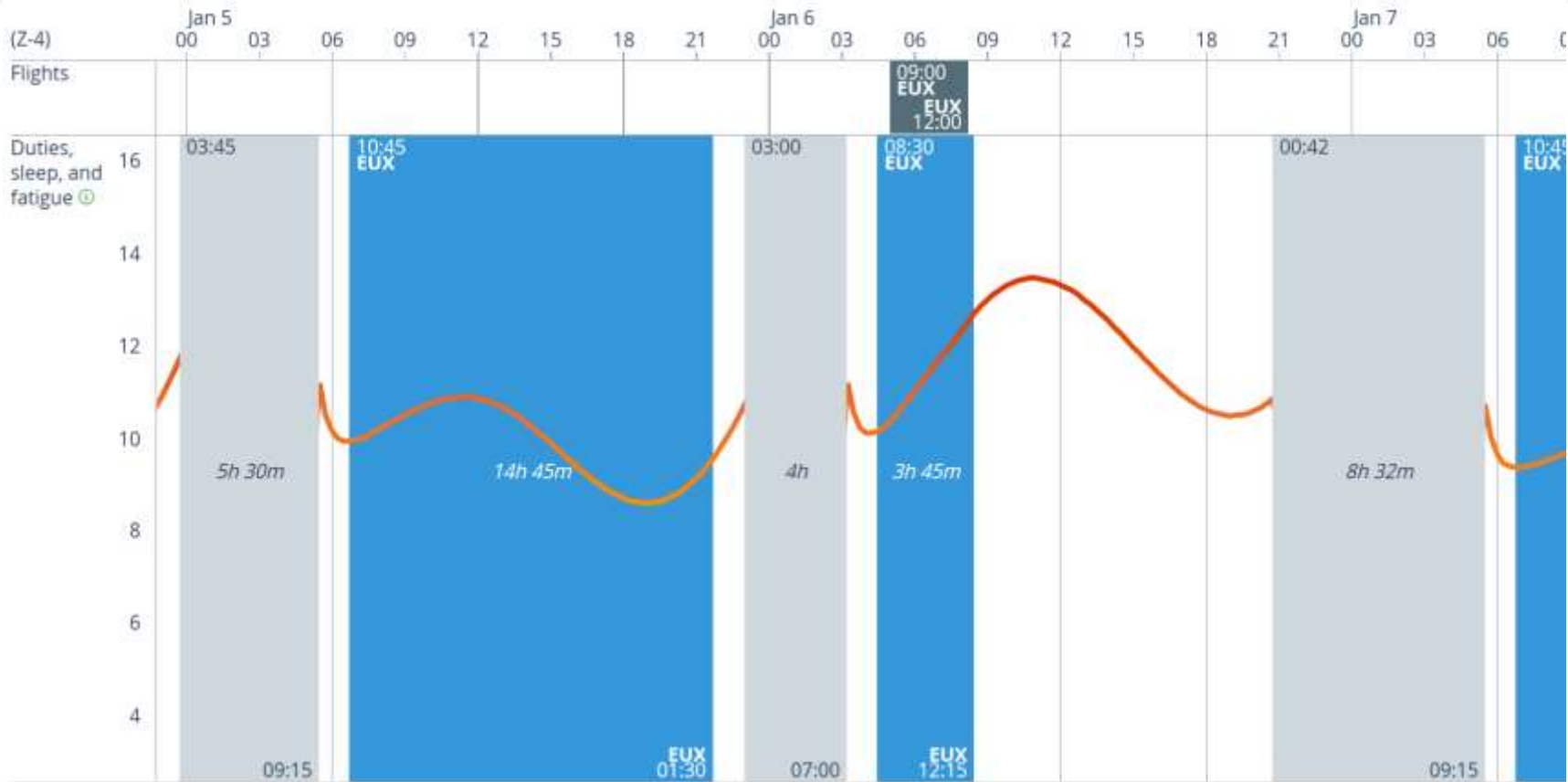


Successes

Established Process for Analyzing Collected Data



First NOI Approved for Non-Scheduled Operation



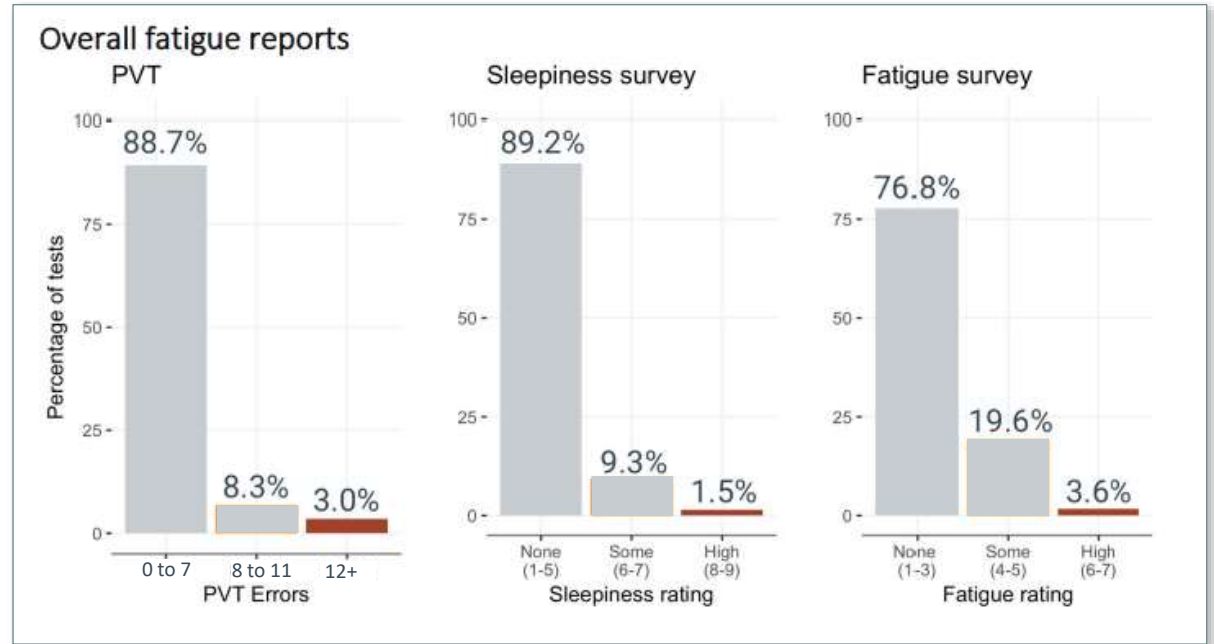
Groundswell of Coordinated Action

- Industry associations are playing an active role in communicating frustration of operators to Transport Canada
- Whitepapers and meetings with senior Transport Canada leaders
- New peer-reviewed scientific paper being published by Pulsar Informatics and Washington State University

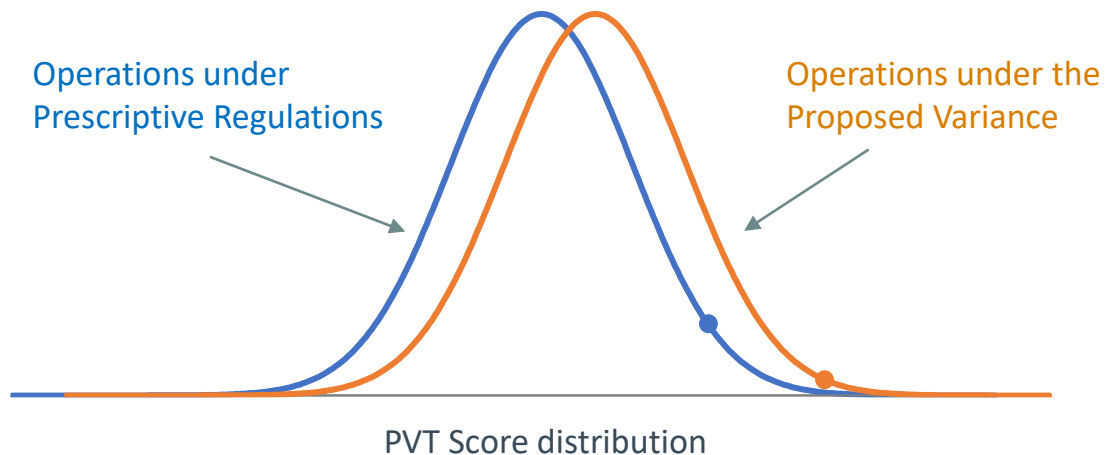
Where do we go from here?

Key Idea #1: Baselining With Real Data

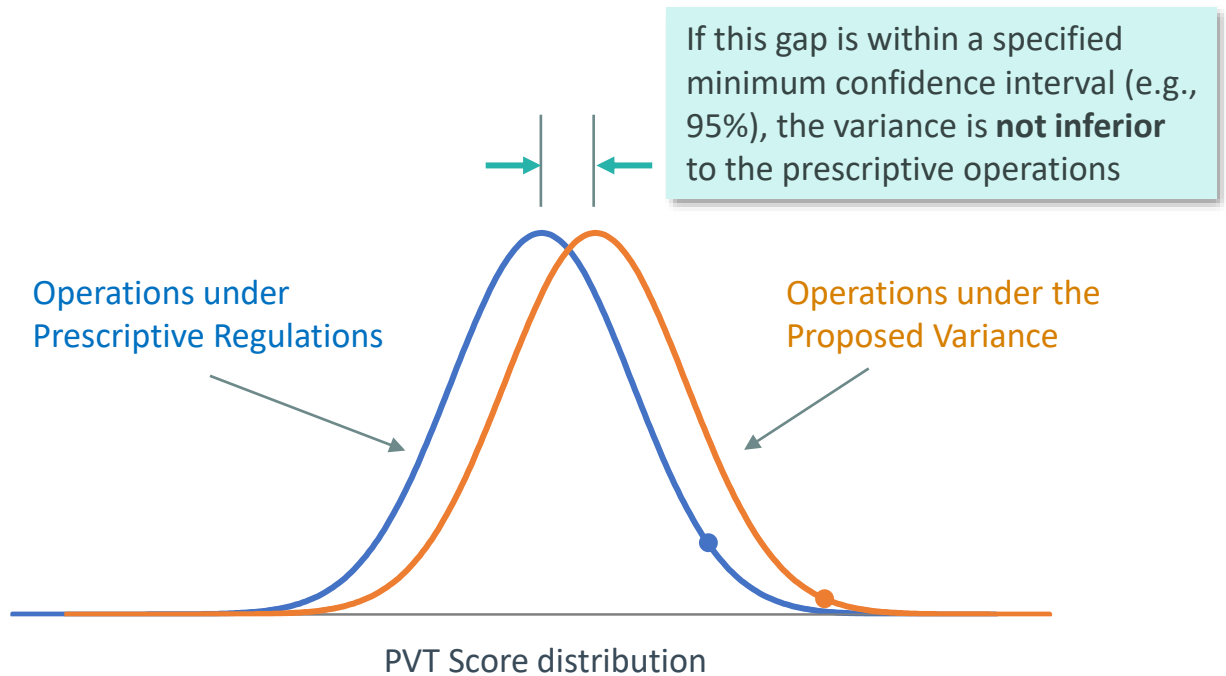
- Collecting multiple types of fatigue and alertness performance data from operations that meet prescriptive requirements can provide a scientifically robust baseline



Key Idea #2: Validation Based on Non-Inferiority Analysis



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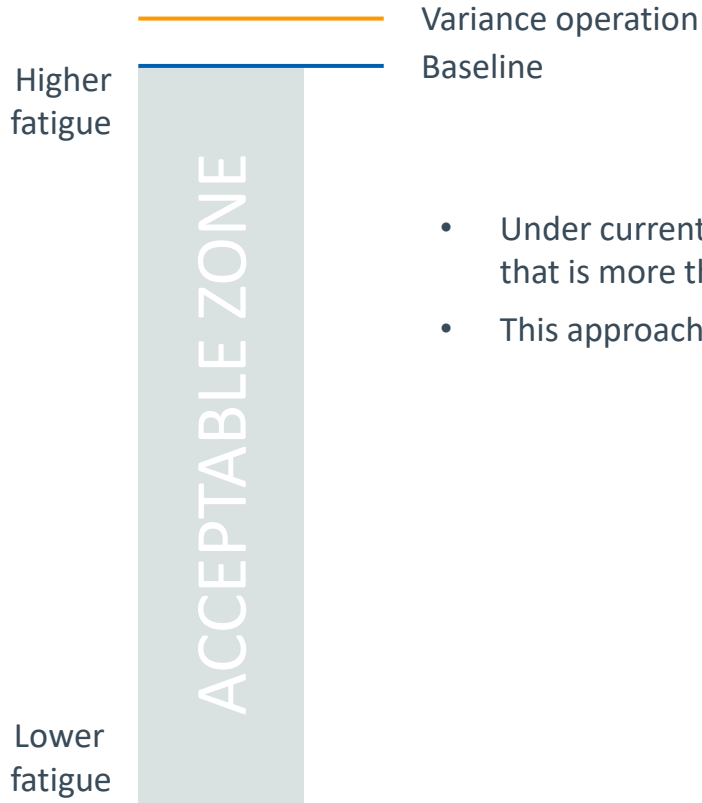
Key Idea #3: Evaluating Data Points Relative to Acceptable Zone

Acceptable
Zone



Fatigue Level	Likelihood of Adverse Consequence	Risk Level Classification	Zone
0 – 7.9	Remote	Low	Acceptable
8.0 – 11.9	Unlikely	Medium	Acceptable with additional monitoring and potential use of risk controls
12.0 – 15.9	Moderate	Elevated	Acceptable with additional monitoring and use of risk controls
16.0 or greater	Likely	High	Unacceptable in most circumstances

Key Idea #3: Evaluating Data Points Relative to Acceptable Zone



- Under current Advisory Circular guidance, if a performance data point has a value that is more than 5% above baseline, it is an Adverse Effect
- This approach makes sense if the baseline is at the upper limit of the Acceptable Zone



Key Idea #3: Evaluating Data Points Relative to Acceptable Zone

Higher
fatigue

Lower
fatigue



- More commonly, the baseline is well within the Acceptable Zone
- In this case, a variance operation that comes in above the baseline is still safe



Founded in 2001 by two UBC graduates, Pulsar has made seminal contributions to the science of fatigue risk management and alertness assessment.



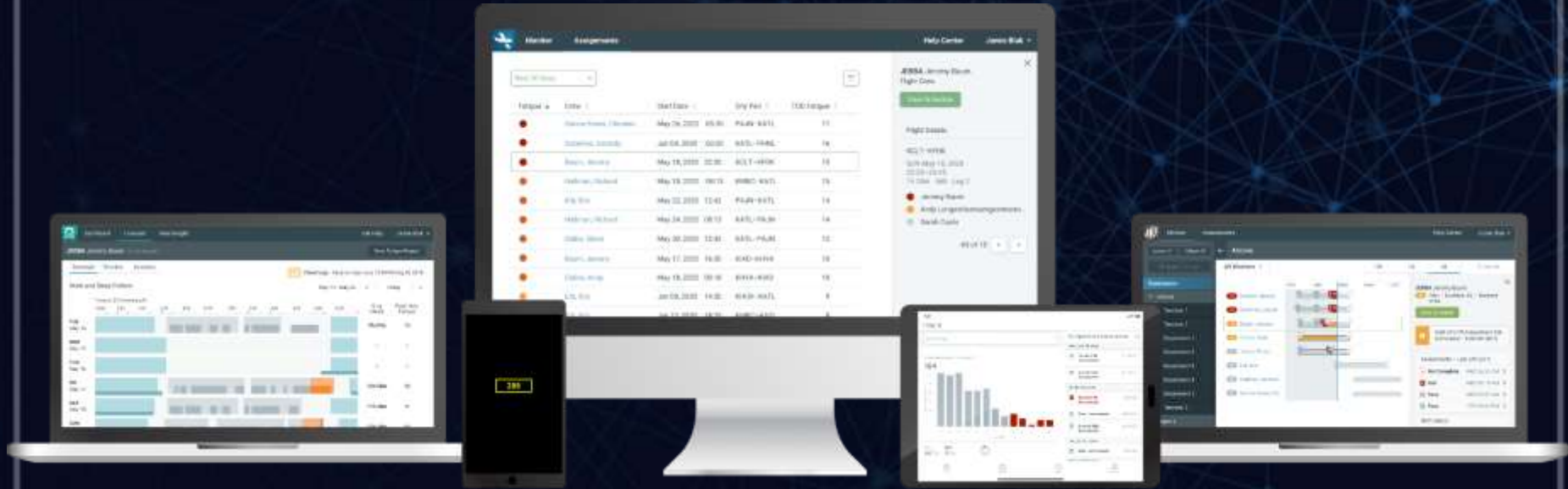
Australian Government
Civil Aviation Safety Authority



U.S. AIR FORCE



We are a global leader in delivering Fatigue Risk Management solutions grounded in published scientific models.





Q&A

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