



**Australian Government**  
**Civil Aviation Safety Authority**

# Safety Performance Indicators (SPIs): Moving from Compliance to Improvement in Fatigue Management

Robert ForsterLee  
Human Performance Team  
Civil Aviation Safety Authority  
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*Safety is the compass pointing you in the right direction, it is up to you to walk the path.*



# Fatigue SPIs

What are they

When to use them

How to use them

Where do they come from

Why use them

What do they achieve

# Key terms for hazard identification and risk management



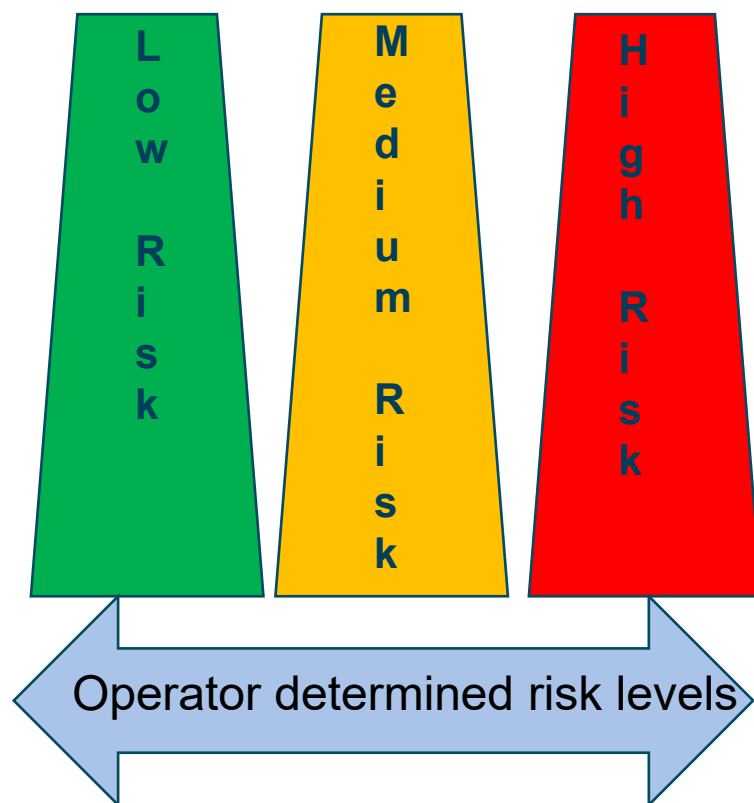
**Controls** are specific actions to reduce a risk event's likelihood of occurring (e.g., adequate ODP as a prevention against reduced sleep quantity). Controls are typically policy and procedures, training, and safety management actions.

**Mitigations** are corrective actions that reduce the severity of a risk event (e.g., consuming caffeine to improve alertness when experiencing higher levels of fatigue).

**Leading SPI** – proactive process-oriented, rate of implementation of supportive actions (use of controls such as sleep prior to duty, mitigations such as caffeine during an FDP where alertness considered low)

**Lagging SPI** – outcome-oriented, measured past events (FDP exceedances in 28 days)

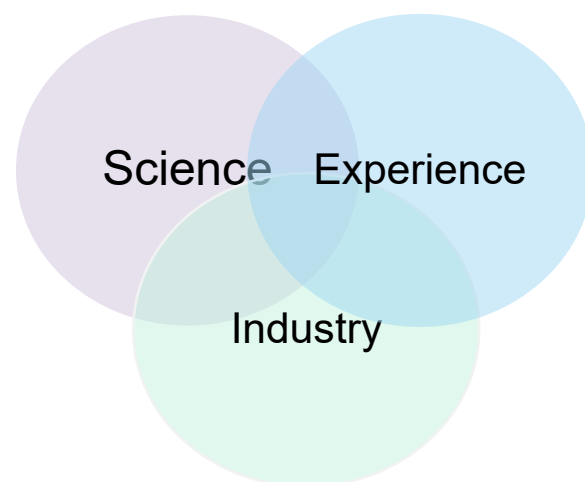
# What is a safety performance indicator of fatigue



SPIs can support an AOC's compliance with regulatory requirements – But this is not their sole or core purpose.

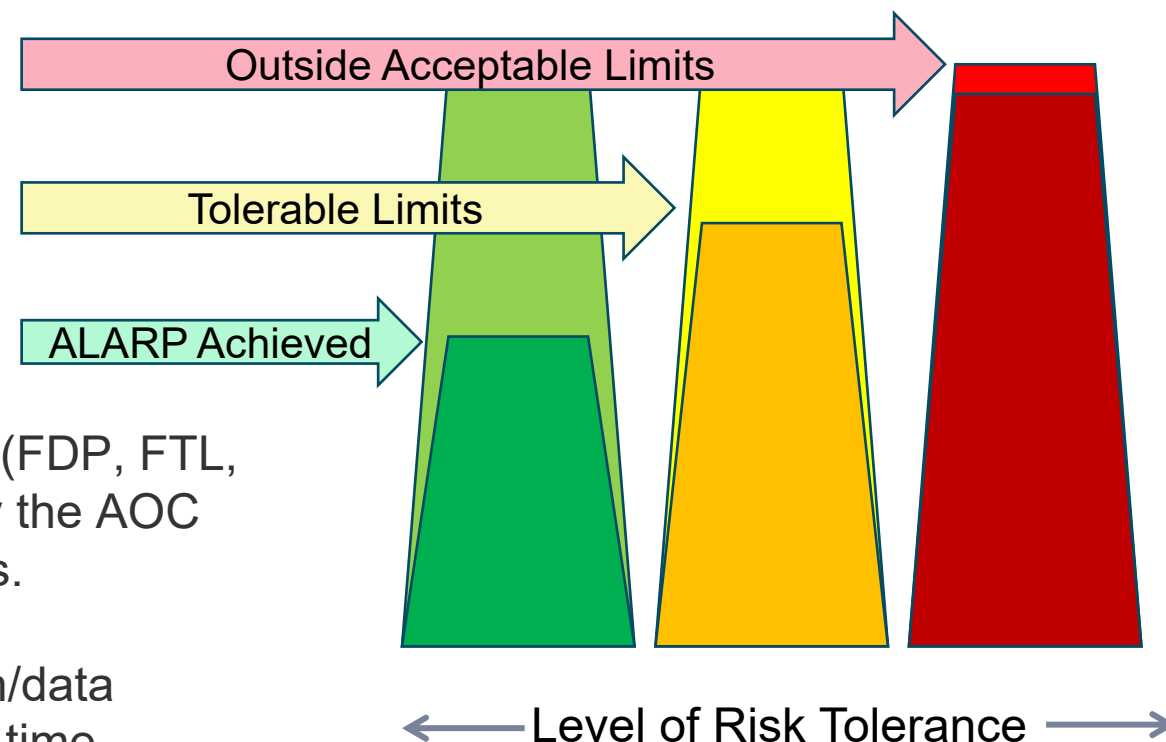
Fatigue SPIs monitor the level of effectiveness of controls and mitigations at preventing and/or minimising factors associated with reductions in alertness prior to, during, and following a flight duty period.

# Where do SPIs come from?



SPIs measures may be derived from any limits (FDP, FTL, ODP), times of duty, or workload considered by the AOC to have adverse consequence and/or risk levels.

Risk levels remain unknown without information/data about the effect of duty length, start time, finish time, conditions of flight (sectors/workload), or how combinations of duty times interact with an FCMs alertness.



# When to use SPIs?

AOCs establish policies and performance limitations based on a level of acceptable risk tolerance within their operation.

Tolerance levels/limits are often based on information from:

## **Science/research**

Science gathers information in a controlled/standardised manner, the questions addressed are then interpreted for the application within aviation.

## **Direct operational experience**

FCMs contribute potential concerns they have and/or historical records are reviewed for the types of actions/events/behaviours that are associated with fatigue reports.

## **Indirect operational experience**

Shared industry information allows for comparison to similar operators who are likely facing the same hazards with equivalent risk factors.



## When to use SPIs Cont.?

Once an SPI is determined, comes the “when” or timing of assessing.

For example, asking about the hours of sleep an FCM achieved (without the aid of technology) would likely be more accurate if the question were asked immediately after waking rather than later in the day or days later.

Similarly, it is more informative completing fatigue level scales at the start of duty and end of duty rather than just at the start or finish of duty.

Annual surveys, without specific prompts, are also subject to memory fade and distortion – better to ask about fatigue within a recent period such as within a week or two rather than months.



# When to use SPIs – Final Thoughts

The frequency of the assessments of SPIs needs a balanced approach.

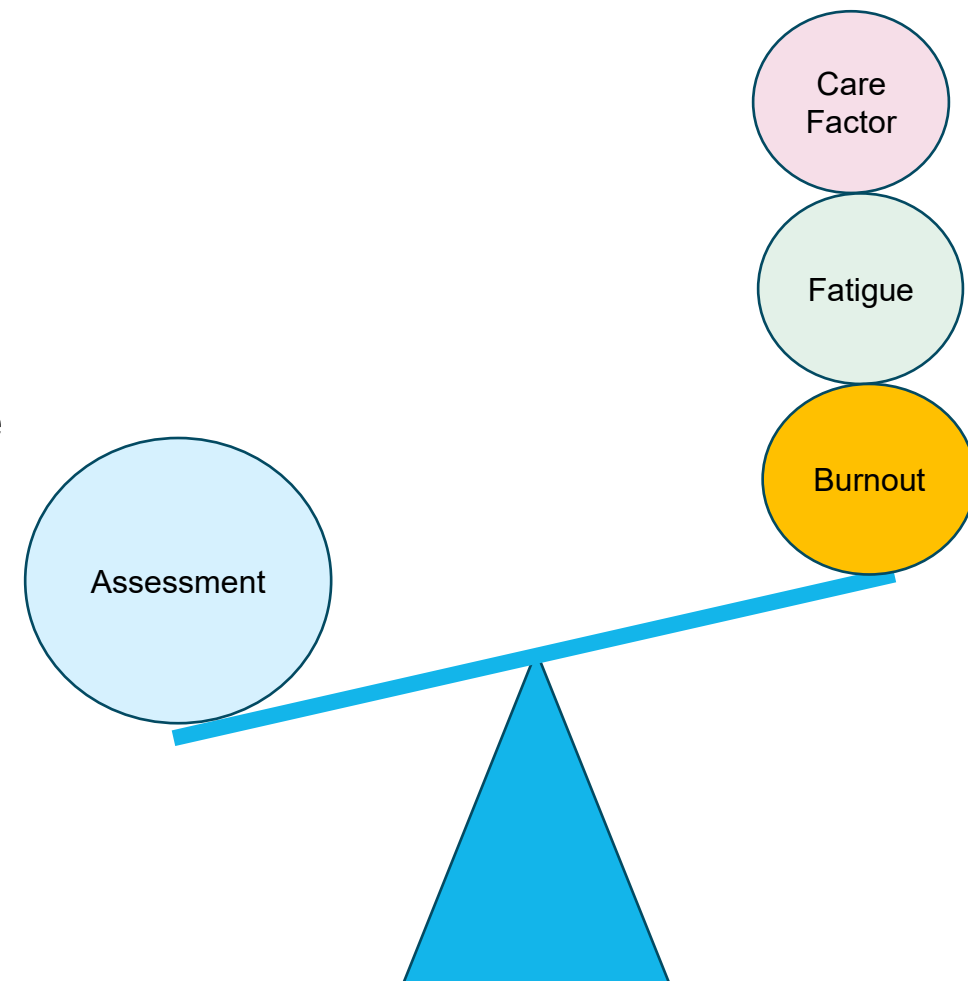
Caveats on continuous assessment (all duties):

- Burnout (reduced participation)
- Complacency in responding (automatically giving a response rather than providing a thoughtful assessment)
- Pressure (internal and external) to comply
- Decreased motivation
- **Survey fatigue**

Use Targeted assessments (strategic in timing and questions).

Limit assessment to discrete times and crewing patterns or periods of increased operational tempo to minimise potential

“survey fatigue” & improve engagement



## Why use SPIs?

The aim of SPIs is to inform if your efforts at preventing/reducing the likelihood of fatigue are effective. The process increases the organisational awareness of the efforts to minimise fatigue risk.

Compliance with fatigue related regulations in its simplest form is:

- (1) *“do our controls and mitigations keep fatigue within a pre-determined level of risk within the operations?”* and
- (2) *“are these risk levels appropriate?”*

SPIs should be developed to inform the operation/maintain the organisational SA of fatigue risk and opportunities.



# How to Use SPIs

SPIs may provide information on:

- the effectiveness of policies and procedures underlying the scheduling of duties,
- the quality of the training (the usefulness of the content, the effectiveness of the training presentation),
- FCM sleep quantity and quality during certain patterns of duty,
- the changing levels of alertness throughout a duty period, and
- the effect of using mitigations (along with times during an FDP when mitigations are engaged, frequency that mitigations are engaged).

Poor accommodation, lack of ground support at aerodromes, frequently encountered environmental conditions, length of duties, delays associated with different types of transport, and staffing levels are potential starting points for SPI development.



# Putting together an SPI list

Indicator	Metric	Meaning or Value Safety Objective	Assess Feedback Action
What is the actual indicator of the fatigue risk for the identified action?	How can the action be assessed?	What do the metrics collected mean for the FCM, the SPI, operations? What is the perceived value to staff?	Has the SPI been assessed, has feedback been provided, what is the result of the assessment?



# SPI Impacts

When done well, within a positive safety culture the impact of SPIs:

- Encourages participation (why SPIs matter)
- Demonstrates commitment to safety/wellbeing (active area of engagement)
- Highlights areas for continuous improvement (controls, mitigations, measures, training, oversight)
- Shows areas of low operational risk (remove/ reduce frequency of measure)
- Illuminate hotspots requiring attention (new SPIs)
- Enhances communication/feedback (SA of safety/fatigue is increased, satisfaction with the SMS/FRMS)





# Leading VS. Managing



Any Questions?

