



# Practical Implementation of FRMS

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Controller Pilot  
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# Agenda

1. Why do we manage fatigue?
2. How do we manage fatigue?



# Clockwork Research

- Fatigue risk management consultancy
- Team of physiologists, psychologists and safety professionals
- Safety critical industries: aviation, energy, mining
- Translate scientific research into operational solutions
- Assisting operators to build fatigue risk management systems for over 10 years



# How much sleep do you need?

*“The number of people who can survive on 6 hours of sleep or less, without showing any impairment, rounded to a whole number and expressed as a percentage of the population is*

*0%”*



# We live in a sleep loss society

There are many factors that influence our sleep daily, and their impact can be additive, for example

*‘an employee who works **irregular hours**, commutes **30 to 60 minutes** to work (one way) and is exposed to a set of different measures of **workplace psychosocial risks**, such as unrealistic time pressures, sleeps on average about **28.5 minutes** per day less than an employee that has regular working hours, commutes only up to 15 minutes (one way) and is not exposed to psychosocial risk factors at the workplace’*

# We live in a sleep loss society

There are many factors that influence our sleep daily, and their impact can be additive, for example

*'an employee who works in a shift system loses 30 to 60 minutes to a set of other risk factors. This equates to over 173 hours of lost sleep per year. On average, an employee spends less than an hour on their commute, only on the way (one way) and is not exposed to psychological risk factors at the workplace'*



# Sleep loss costs society

Figure ES.1: Economic costs of insufficient sleep across five OECD countries



Notes: RAND Europe analysis

# And it costs our operations

- Poor quality of work – increased errors and short-cuts
- Increased short-term absenteeism
- Increased long-term sick
- Experienced personnel resignations
- Impact on skill learning and memory
- Difficult to recruit new personnel
- Crew close to limits means there is no buffer for disruption
- Scheduling ‘paying Peter by robbing Paul’
- Increased safety events
- Cancelled flights

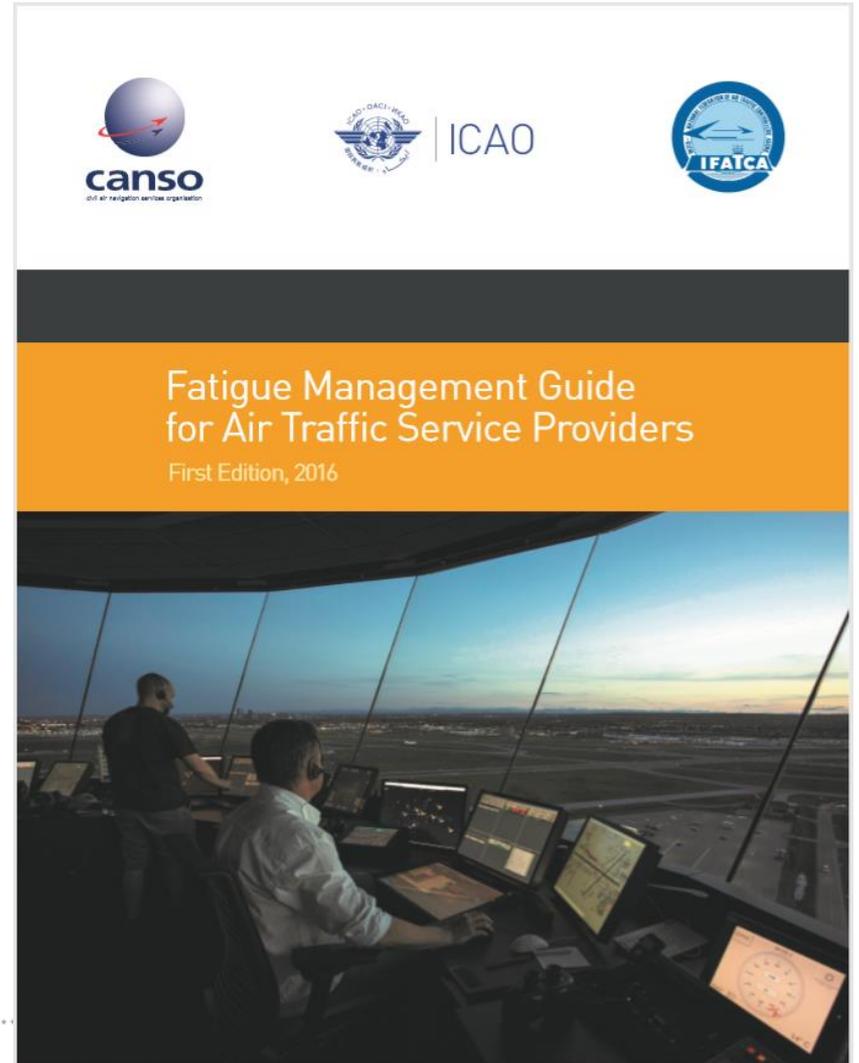


# What are we doing about fatigue and sleep loss?

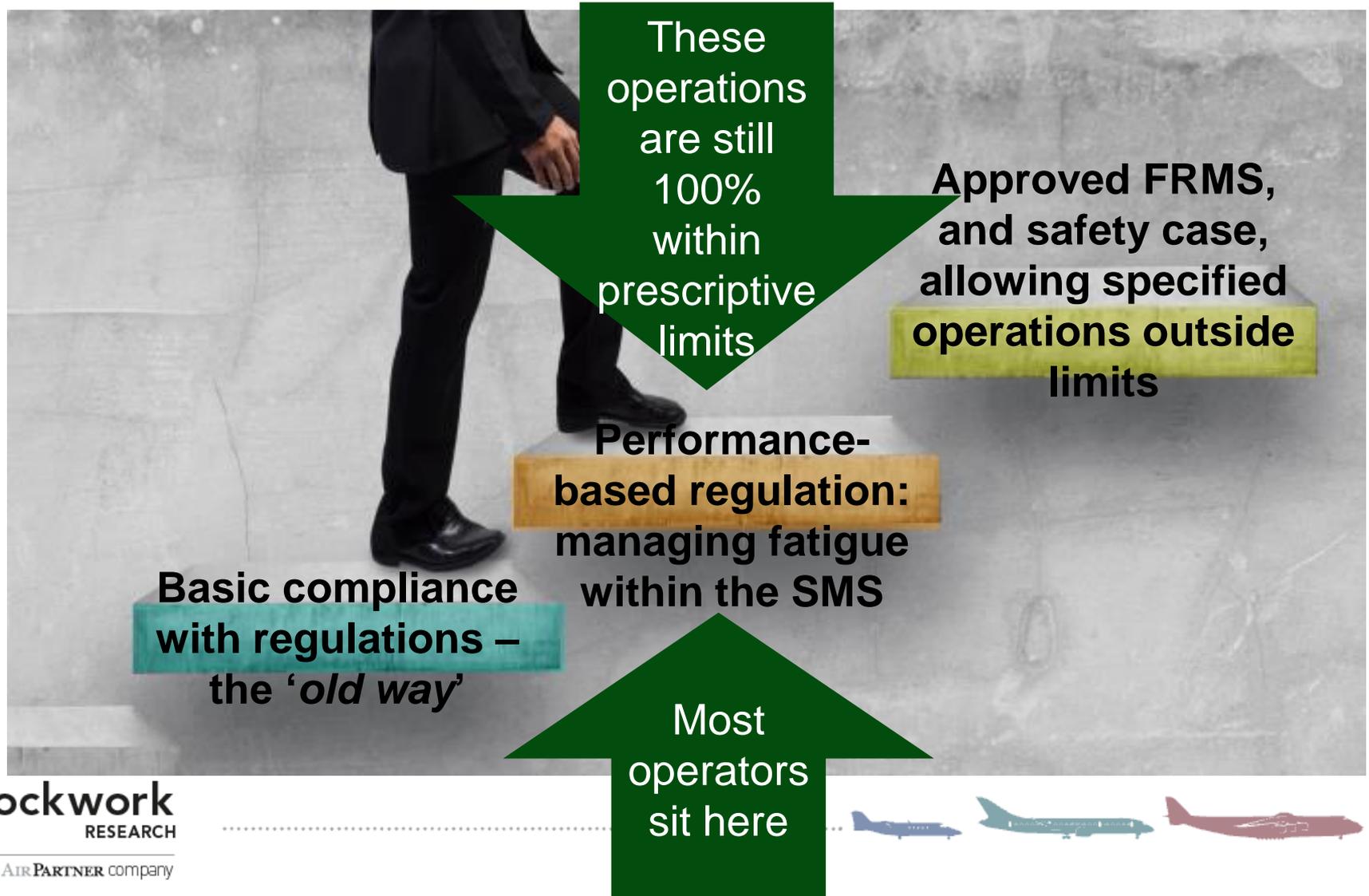
- Movement from prescriptive limitations to managing risk
- Fatigue management is a shared responsibility
- Using and understanding scientific principles



# ICAO SARPS for ATC



# What is fatigue risk management?



# Fatigue Management in ATC vs CAT under EASA regulations

## Similarities

- Use SMS processes to manage fatigue
- Fatigue policy
- Individual scheme for hours of work (rostering)
- Fatigue reporting
- Data collection
- Deliver training and education on fatigue

## Differences

- CAT operators provided with 'outer limits' for Flight time specification schemes
- ATC operators must develop own rostering scheme to manage fatigue risk



# Fatigue management does not eliminate the risk of fatigue

- Fatigue will always be present in aviation, but we have to manage the risk
- FRMS, or managing fatigue through the SMS, allows operators to identify the risk, implement mitigations, and manage the risk



# What are the keys to effective fatigue management?

ENGAGEMENT

TRUST

What about the role of consultants?

RESOURCE

BESPOKE





**fatigue**

# Advice on measuring fatigue

- It is necessary to use multiple measures, for example surveys, fatigue model analysis, existing safety databases, focus groups
- Usually, the more data the better. Missing data is the enemy
- Consider both objective and subjective data
- All measures assess fatigue from a different perspective, don't expect them to mirror each other



# Constructing 'fatigue-friendly' rosters

- The 'perfect schedule' has us working during the day, with unrestricted sleep at night
- But this is not operationally feasible...
- Consideration of contributors to fatigue:
  - Is sleep being restricted? E.g. earlies/lates/nights
  - Working in a circadian low point?
  - Consecutive duties
  - How much recovery between shifts and blocks of shifts?
  - What is the level of workload?
  - Are workers on-call?



# **W**ORD OF THE DAY



**INDEFATIGABLE: ABLE TO GO ON FOR A VERY LONG TIME WITHOUT GETTING TIRED**



# **W**ORD OF THE DAY

Thank you for your attention

Does anyone have any questions?

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VERY LONG TIME WITHOUT GETTING TIRED***