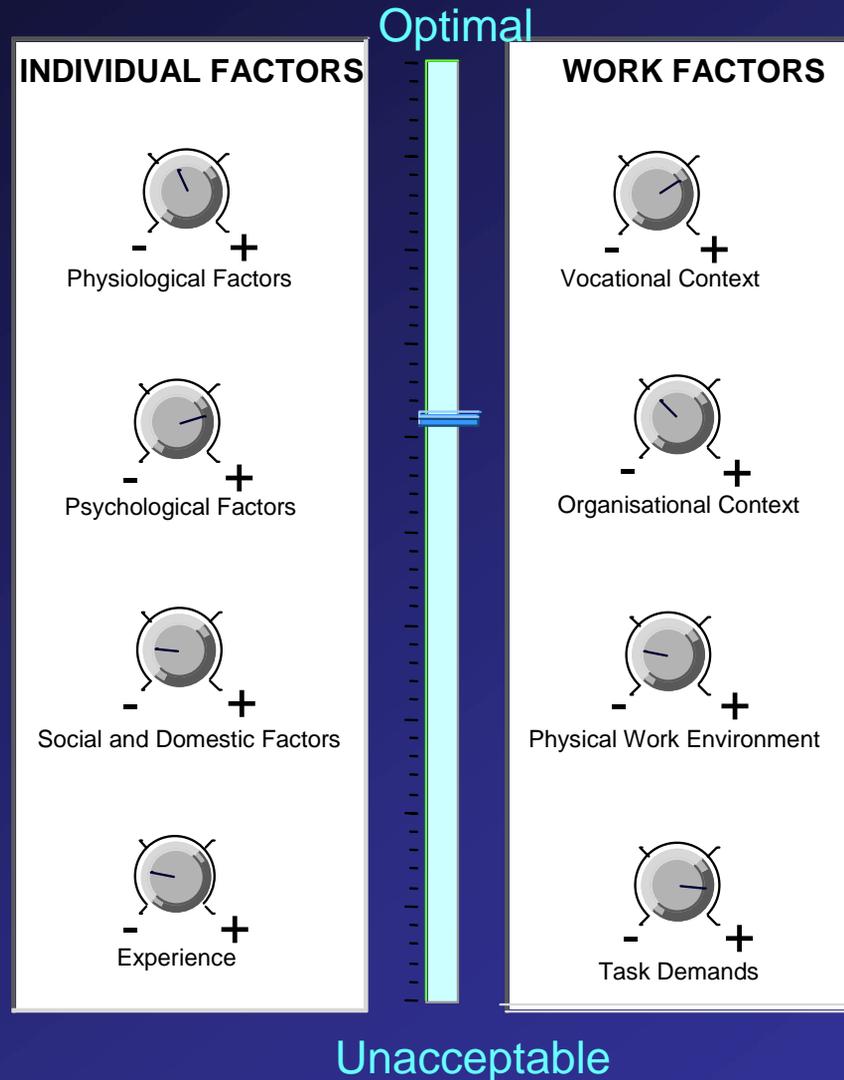


# FATIGUE AS A CONTRIBUTING FACTOR: HOW FAR SHOULD THE INVESTIGATION GO?

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# Range of performance



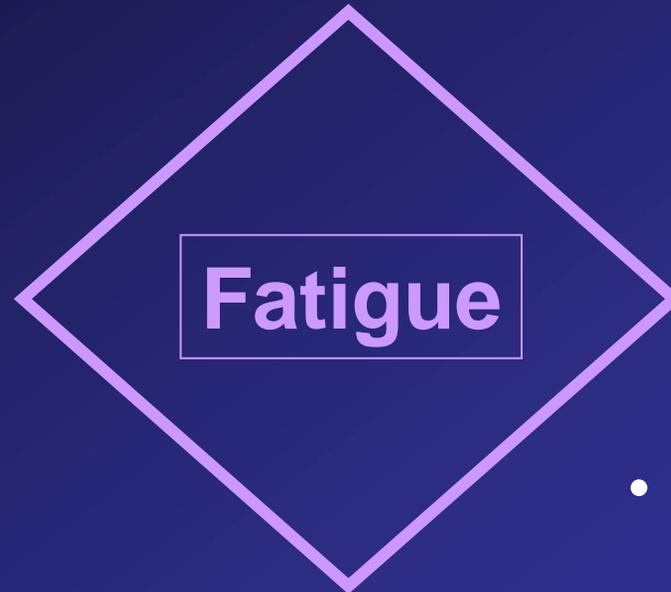
# What causes fatigue?

- **Job demands**

- workload & breaks
- work duration
- type of work

- **Human biology**

- sleep
- body clock
- health, age



- **Work organisation**

- trip scheduling
- work predictability

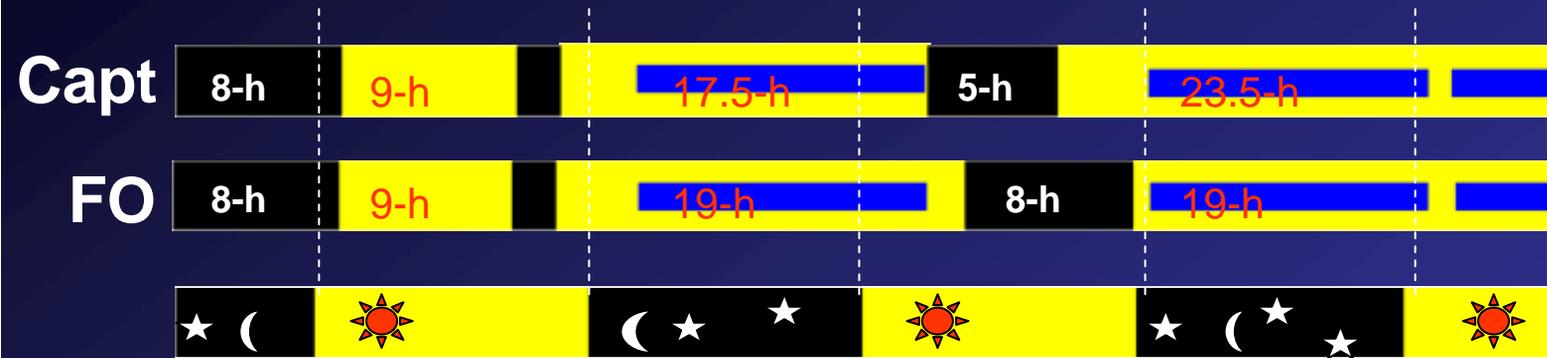
- **Life outside work**

- family & friends
- commuting
- standard of living

# Stress and fatigue as workplace hazards

- **Is it either possible and/or reasonable to consider stress and fatigue to be workplace hazards analogous to an environmental hazard such as noise?**

# Guantanamo Bay, 1993



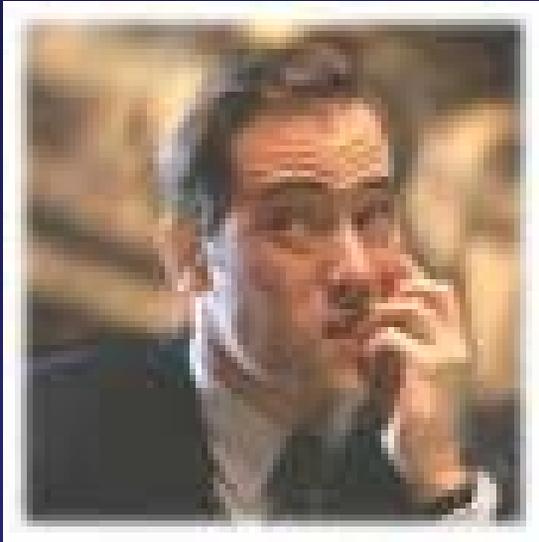
- Working at night
- Sleeping during the day
- Long periods of work and wakefulness

# The questions

- Time of day of the incident/accident
- Acute sleep loss
- Cumulative sleep loss
- Prior wake time
- Workload
- Breaks
- Cumulative work hours

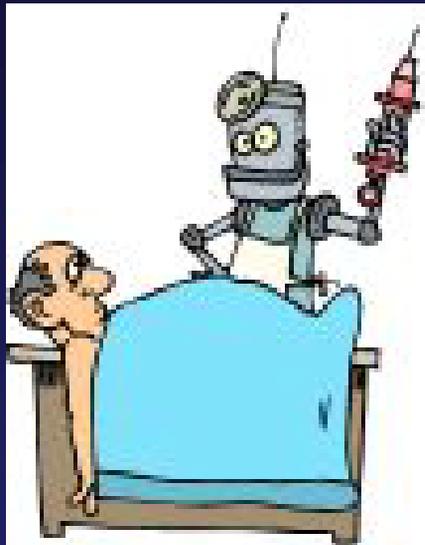
# When are these questions asked?

## 1. In incident/accident monitoring systems



Difficulty in interpretation

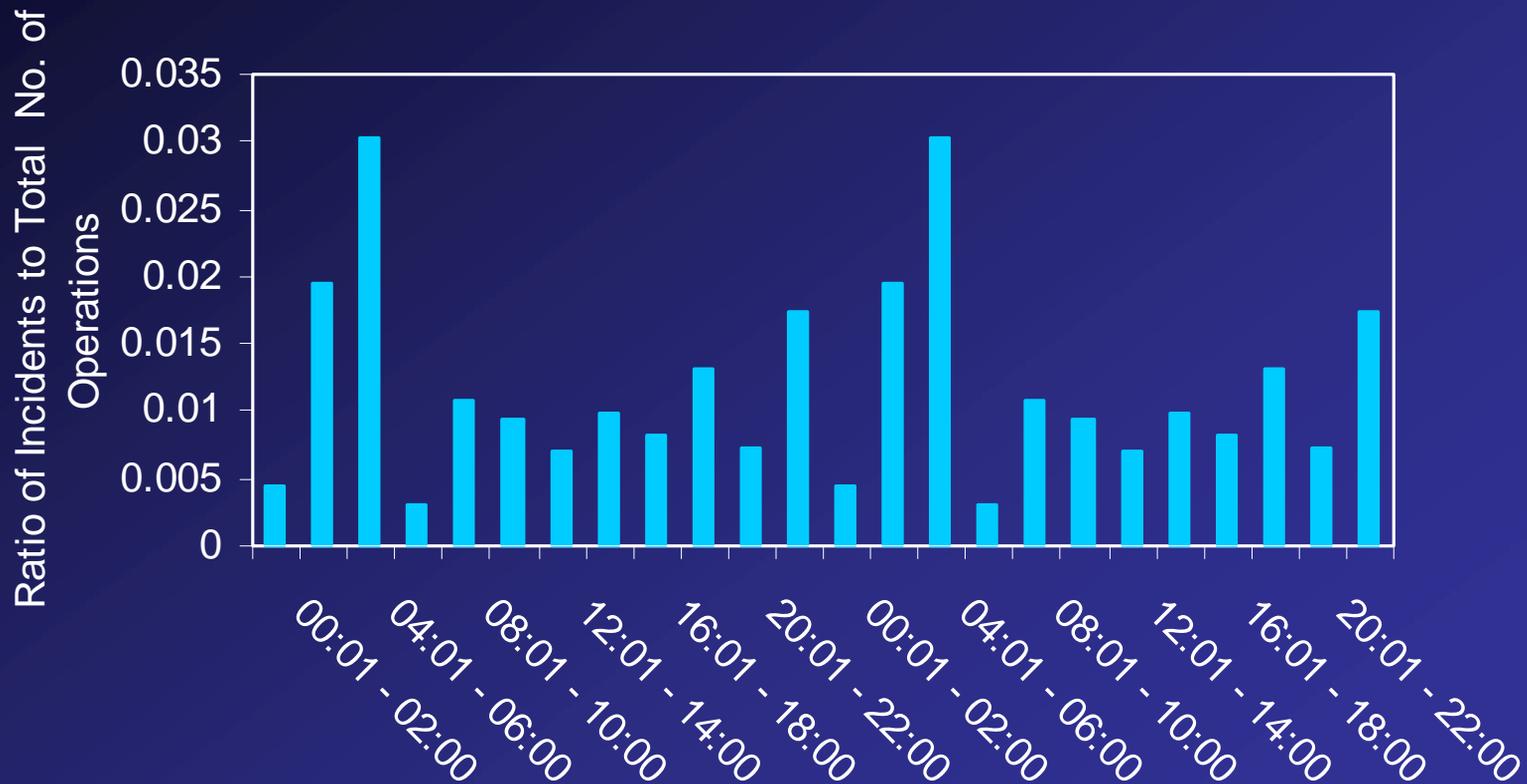
# Underestimating fatigue



- Unreliable estimators
- Sleepiness - performance link unrecognised
- “Normal” fatigue
- Reticence to admit shortcomings
- Unacceptable excuse
- Professional culture
- Too tired to report
- Lack of knowledge of preceding events

# AIMS reports

N = 240



# AIMS reports: Self-assessed fatigue related incidents

- **Fatigue-related incidents were:**
  - 7.4 X more likely to be reported with 2+ h of sleep debt
  - 6.5 X more likely to be reported when working for 10+ h

# AIMS reports: Fatigue risk grid

Level of Risk of Fatigue Effects	Risk Categories		
	10+ h at work	2+ h sleep loss	Time of Day 0201 - 0600
(Low) 1			
2	✓		
3		✓	
(Moderate) 4			✓
5	✓	✓	
(High) 6	✓		✓
7		✓	✓
(Very High) 8	✓	✓	✓

# AIMS reports: Findings

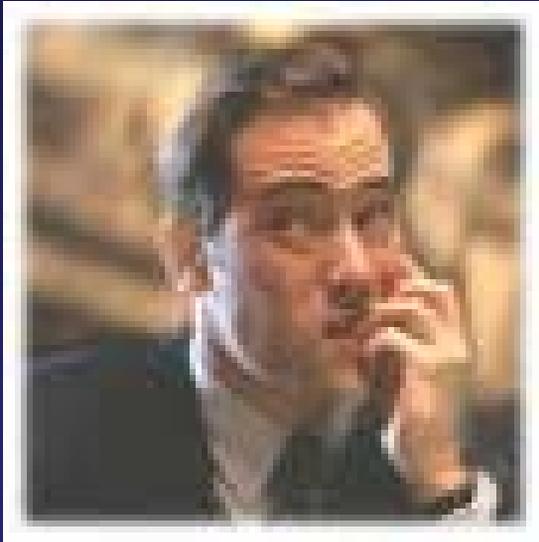
- **3% reported as fatigue-related.**
- **10% highly likely to be fatigue related.**
- **A further 5% moderately likely to be fatigue related.**

# AIMS reports: underestimation

Level of Risk of Fatigue Effects	Risk Categories			No. of reported incidents (N = 240)	No. reported as fatigue-related (N = 11)
	10+ h at Work	2+ h Sleep Loss	Time of Day 0201 – 0600 h		
(Low) 1				167	1
2	✓			1	1
3		✓		37	4
(Moderate) 4			✓	1	1
5	✓	✓		10	
(High) 6	✓		✓	21	1
7		✓	✓	3	3
(Very High) 8	✓	✓	✓	0	

# When are these questions asked?

## 2. As part of a Fatigue Management Programme



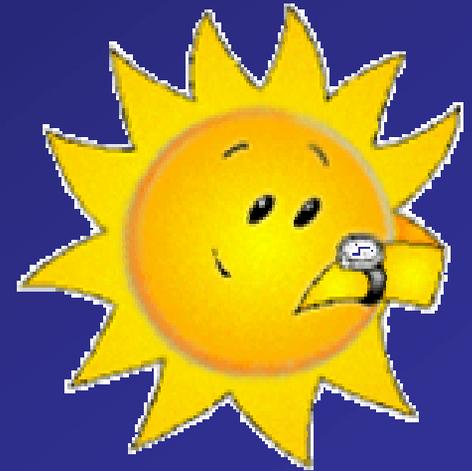
Assumes everyone involved will act reasonably

# Fatigue Management Programmes (FMPs)

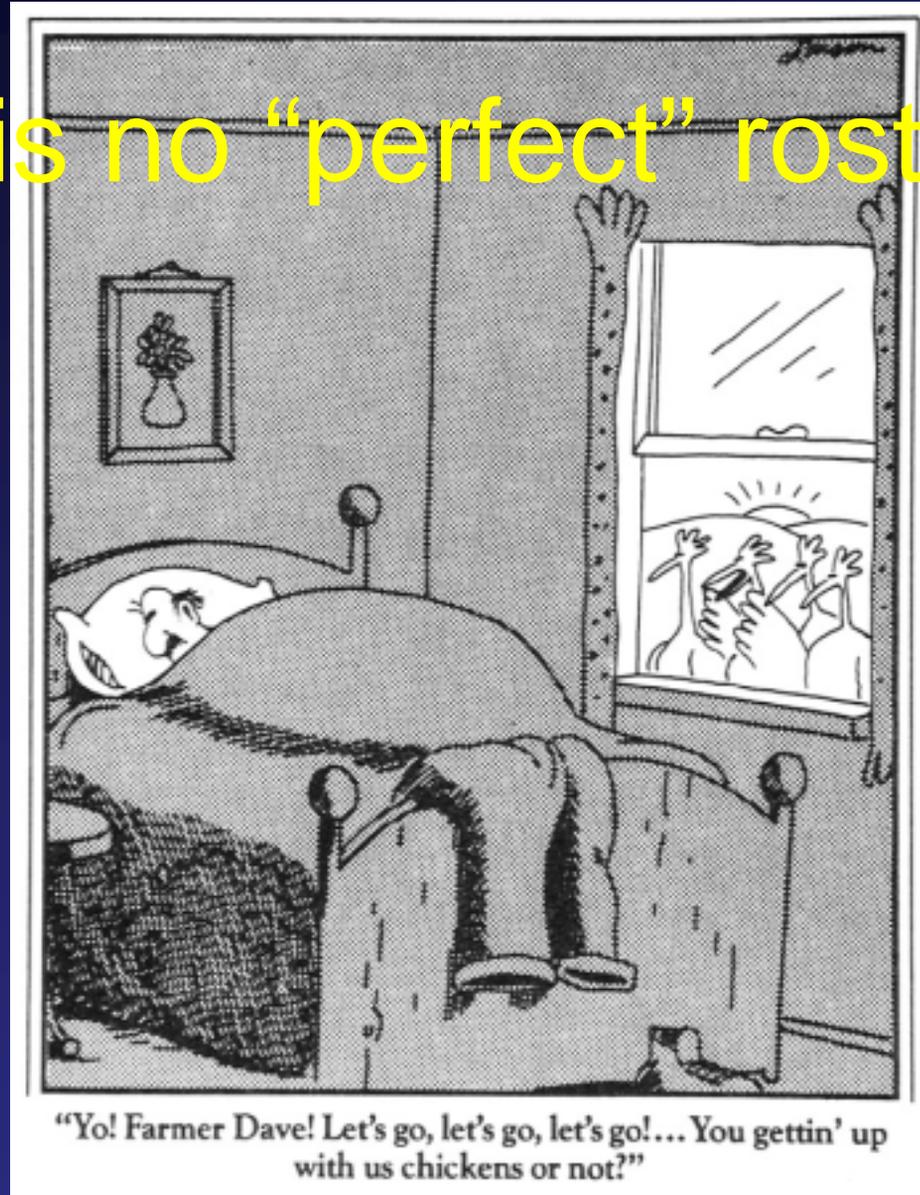
- **Good rostering practices**
- **An informed workforce**
- **Active management involvement**
- **Monitoring of safety-related outcomes**

# Good rostering principles

- **Have workforce “buy-in”**
- **Ensure adequate opportunities for sleep**
  - 8 h off does not equal 8 h sleep
  - Direction of shift rotation
    - Forward (mornings-afternoons-nights)
    - Backward (nights-afternoons-mornings)
- **2 full nights off for recovery**
- **Takes account of circadian rhythms**
  - Speed of shift rotation
    - Slow to allow circadian adaptation
    - Fast to avoid circadian shifts
- **Address fatiguing aspects of work demands**
  - Avoids excessive work hours
  - Allows work breaks



# There is no “perfect” roster

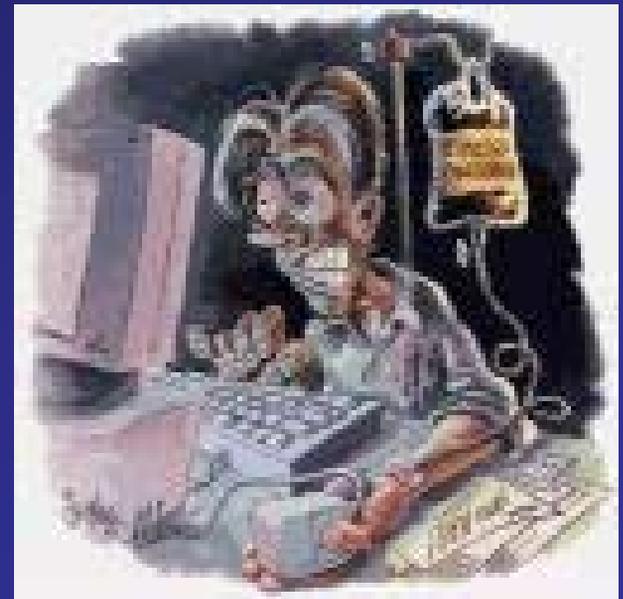


“Yo! Farmer Dave! Let’s go, let’s go, let’s go!... You gettin’ up with us chickens or not?”



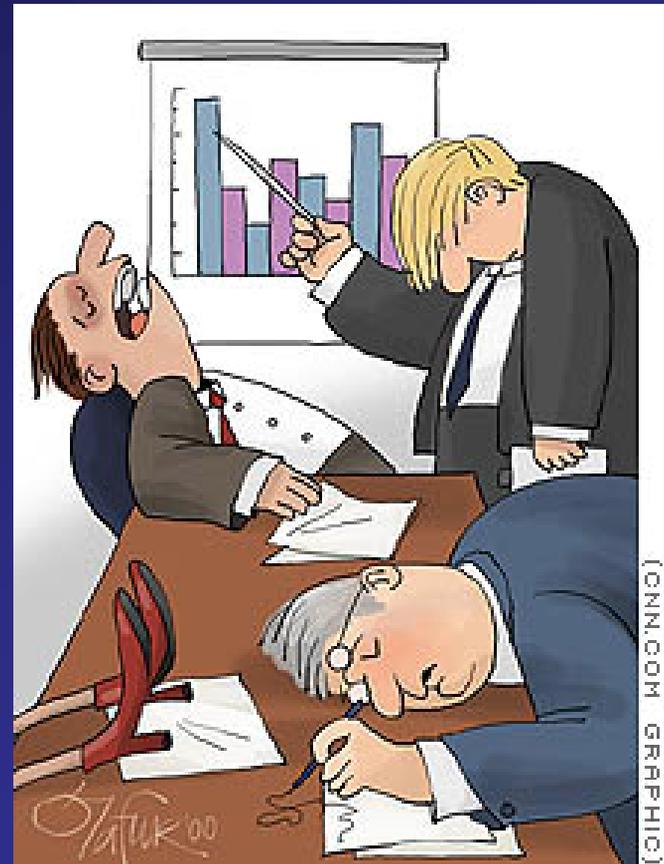
# An informed workforce

- Informed personal risk assessment
- Personal strategies
- Educate families
- Management

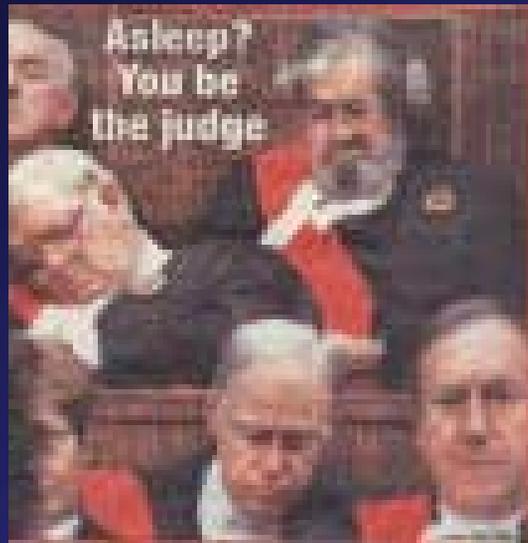


# Active management involvement

- Assigns importance
- Transparent policies and processes
- Consistent treatment
- Actual versus rostered hours of work
- Identification of “at risk” personnel
- Medicals



# Monitoring of safety-related outcomes



- Learning from mistakes of others
- Errors versus pre-errors
- Difficulty in interpretation

# Concerns

- Complexity and cost
  - accreditation
  - compliance
  - policing
- Unfair competitive advantage for larger companies?
- Do they work?
- Potential for misuse

# When are these questions asked?

## 3. On accident investigation



When do your suspicions that fatigue may have been a factor get aroused?

# Do you.....

- **Start at the obvious?**
  - How far back do you go?
- **Look at people further “upstream” (a la Reason’s model)?**
  - How do you examine their sleep/fatigue/stress issues?
- **What makes it relevant?**

**My answer:** We don't know

**Why:** No data

# A way forward

- **Consistent collection of data by the entire accident investigation industry**
  - Collecting the same data allows identification of benchmarks.
  - Avoids reliance on an individual's suspicions.

# Thank you