



Fatigue

***An opportunity for health
and safety improvements***

Gateway HSW Consultants

Health, safety and wellbeing consultancy established in 2018, Gateway HSW is a recognised UK market leader for professional training and consultancy services in health, safety and wellbeing. Founded by Shelley Stiles and Clare Richardson.



Occupational Health
and Hygiene



Mental Health
and Wellbeing



Strategy, Leadership,
Culture and Behaviour



Fatigue Risk
Management



Safety Risk
Management

Fatigue and Incidents

THE NEWSPAPER

Finance - Politics - Editorial - Obituaries - TV and radio - Weather - Sports

Friday - 50 cents



Challenger Space Shuttle 1986

Chernobyl 1986

Clapham 1988

Exxon Valdez Oil Spill 1989

Texas Oil Refinery 2005

Croydon Tram Crash 2016

Understanding our Legal Obligations

Health and Safety at Work etc. Act 1974

General duties of employers to their employees - duty of every employer to ensure, so far as is reasonably practicable, the health, safety and welfare at work of all employees.

Duties of employees to take care of themselves and others, co-operate with employer

Management of Health and Safety at Work Regulations 1999

To undertake risk assessments to identify potential hazards to employee health and safety and anyone who may be affected by their work activity.

Working Time Regulations 1998

You cannot work more than 48 hours a week on average - normally averaged over 17 weeks.

Railways and Other Guided Transport Systems (Safety) Regulations 2006

Applies to railways and other guided transport

Why is Fatigue Important?



17 hours of sustained wakefulness leads equivalent to a blood alcohol level of 0.05% (two glasses of wine).



25-33% of all fatal and serious crashes involve somebody who is at work at the time.



Night shifts and rotating shifts can cause severe sleep disruption.



ROSPA estimate the risk of a driver falling asleep at the wheel at 2am to be 50 times greater than at 10am.



Younger drivers have been found to be more susceptible to the effects of sleep loss when awake for an equivalent length of time.



Health conditions can be caused or made worse by fatigue and disrupted sleep – diabetes, high blood pressure, link to cancer.

Fatigue Related Performance Impairments

Alertness	<ul style="list-style-type: none">• Falling asleep uncontrollably (a micro sleep)• Drifting into auto pilot
Attention and concentration	<ul style="list-style-type: none">• Reduced awareness• Reduced ability to multitask and share attention, such as focusing on one task to the detriment of everything else• Reduced frequency of communication• Overlooking or skipping tasks, or part of tasks, or mixing up the order
Memory	<ul style="list-style-type: none">• Forgetting information• Mis remembering information
Reaction times	<ul style="list-style-type: none">• Delayed response, for example to alarms• Lack of response
Decision-making	<ul style="list-style-type: none">• Misinterpreting the situation• Displaying signs of flawed logic or poor judgement• Being unable to adapt to the changing situation
Risk taking	<ul style="list-style-type: none">• Taking a short cut in a task which reduces effort or time to complete it

What is Fatigue?

‘A state of **reduced mental** or **physical capability** resulting from sleep loss or extended wakefulness, disruption to circadian rhythms (the ‘internal body clock’), **workload** (mental and/or physical activity) and/or prolonged working that can impair alertness and the ability to perform safely and/or effectively’.

A fatigued person will be less alert, less able to process information, will take longer to react and make decisions, and will have less interest in working compared to a person who is not fatigued.

Is tiredness the same as fatigue?

Tiredness can be described as *“a feeling that you would like to sleep or rest, needing rest”*

(Oxford dictionary, 2021)

Causes of Fatigue



the body's natural rhythms



work schedule



work environment



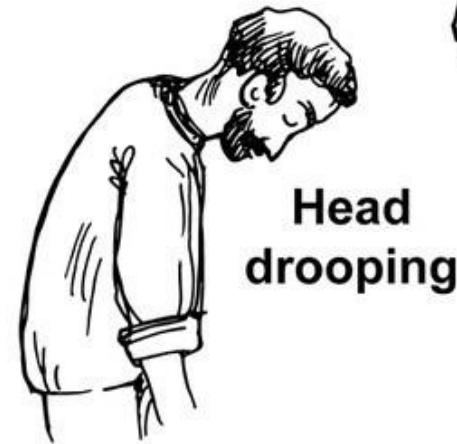
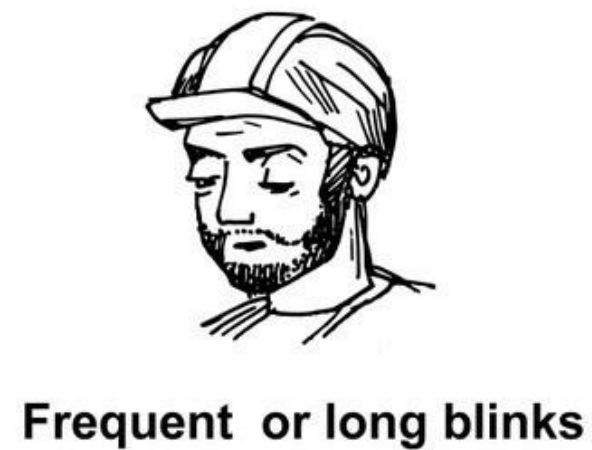
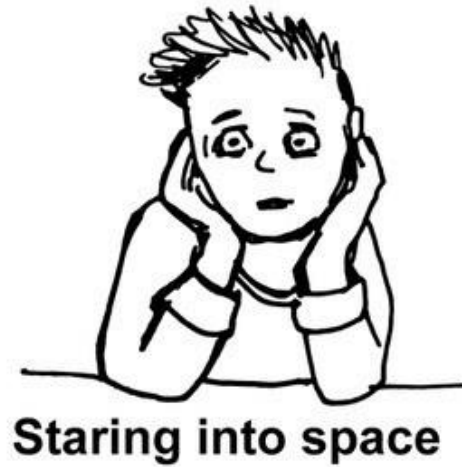
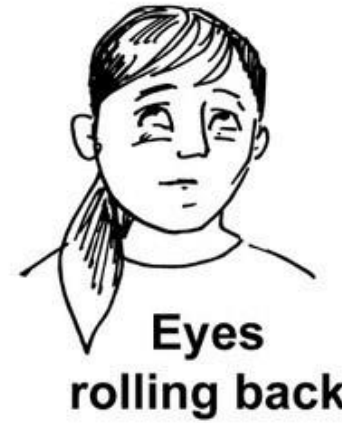
non-work-related issues



lack of sleep

Signs of Fatigue

Signs of Serious Fatigue



Fatigue in Relation to Occupational Road Risk

- It is estimated that between 25-33% of all fatal and serious crashes involve somebody who is at work at the time.
- Under the law, employers' Duty of Care to reduce fatigue risks therefore extends to all road journeys and vehicles used by employers.

Drivers	<ul style="list-style-type: none">• Those who's main job is driving (e.g. professional drivers of goods and passenger vehicles)• Those who drive in the course of their work for whom driving is not the main work activity (e.g. safety-critical staff, managers, shift workers, contractors, agency workers)• Those who only drive occasionally, or as a result of disruption
Journeys	<ul style="list-style-type: none">• All journeys made for work purposes when an employee is 'at work', regardless of distance, This includes travel from home to a location which is not the usual place of work and also travelling for training purposes.• Under current legal definitions, a driver travelling from home to their normal place of work is not considered to be 'at work'. However, there are known fatigue risks associated with 'normal' home to work community and these need to be managed
Vehicles	<ul style="list-style-type: none">• Specific purpose-built (fleet) vehicles provided by employer.• Company cars and vans.• Lease and hire vehicles,• 'Grey fleet' – drivers own private vehicle.

Construction Industry Fatigue

- The UK construction industry has one of the highest rates of psychosocial health problems, including fatigue and burnout.
- The UK construction industry ranks third for the highest average hours worked per week.
- Over 80% of construction workers in the UK are not getting enough sleep.
- Only 14% of construction workers in the UK work fewer than 40 hours a week.
- 44% of construction workers in the UK travel around 2-3 hours a day to work and back.
- Long working hours have been identified as the most significant contributor to poor mental health within the UK construction industry

Reference CCS Scheme survey 2022

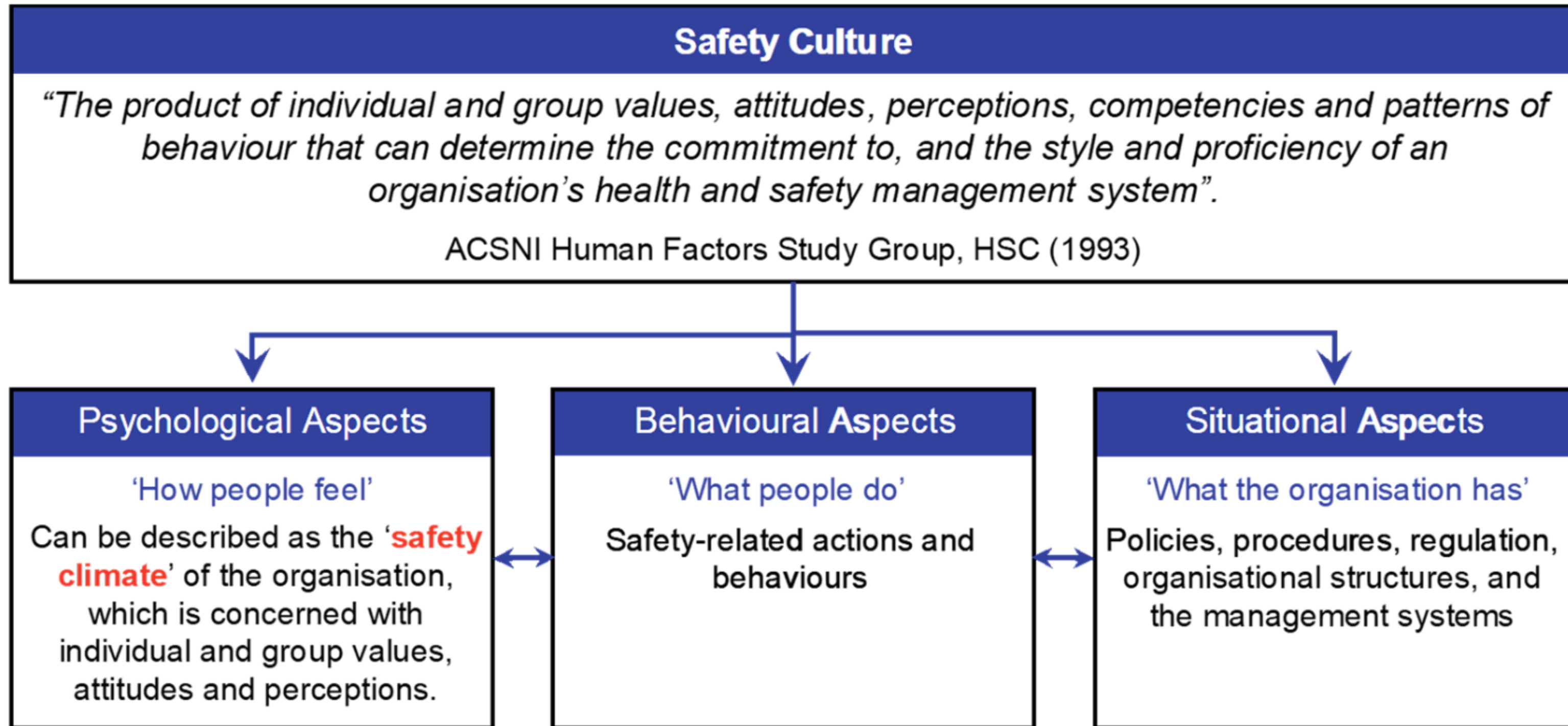


Rail Industry Fatigue

- Long established link between fatigue and significant events – Clapham 1988 – Hidden report
- Railway and Other Guided Transport Systems (Safety) Regulations 2006 – arrangements for safety critical work
- Fatigue is identified as a factor in twenty-one percent of high-risk rail incidents (Rail Safety and Standards Board, 2022)
- Industry wide standards set
- Tends to be focused on shift duration, 14-hours door to door
- Guidelines for managers and supervisors, what to look for, how to hold fatigue conversations
- Fatigue should be integrated into other safety and wellbeing systems



Fatigue and Safety Culture



Seafarer Fatigue

- The Department for Transport (DfT) research has also added weight to the international union campaign to ensure vessels have adequate crewing levels.
- Titled Understanding seafarer roster patterns and fatigue on vessels, the research report was published in 2023
- The most striking finding to emerge from the research was the impact of shift patterns on crew fatigue. The researchers found that most seafarers work 12 hours per day, usually in one of the following shift patterns:
 - 12 hours on/12 hours off
 - 6 hours on/6 hours off split shift – most fatiguing shift pattern




Department
for Transport

Understanding seafarer roster patterns and fatigue on vessels

Authors: The Behavioural Insights Team and Transport Research Laboratory

Health Care Sector and Fatigue

- 33% Doctors reported excessive fatigue in their role
- Campaign 'fight fatigue'
- Learning from other Safety critical industries
- Fatigue risk impacts – patient safety and care, personal safety of staff, including risk associated with driving after a shifts
- Lack of standardised approach for fatigue management
- Potential roadmap outlined to develop system wide approach
- Fatigue associated with incidents, poor decision making, lack of empathy



Benefits of Getting Enough Sleep



You'll Behave Better

We're grumpier, snappier and have less patience when we've not had enough sleep.



You'll Perform Better

Losing sleep erodes concentration and problem-solving ability. Each hour of sleep lost per night is associated with temporary loss of 1 IQ point.



You'll Think Better

Lack of sleep causes changes to the way our brains function in areas of impulse control and decision making.



You'll Feel Better

Sleep deprivation raises average daily blood pressure and your heart rate.

[The Sleep Charity](#)

How Much Sleep Do We Need?



Less than **6** hours

Those who frequently **get fewer than six hours a night** are at significant increased risk of **stroke and heart disease**

Bus Drivers and Fatigue

- Risks - 24-hour operations, variable shift patterns, urban traffic congestion
- Factors to consider - Limited control of breaks, sleep patterns, diet and opportunity to exercise
- Potential solutions
 - Education
 - Working Conditions
 - Schedules and rosters
 - Open culture
 - Health including sleep health



Bus Driver Fatigue

Final Report



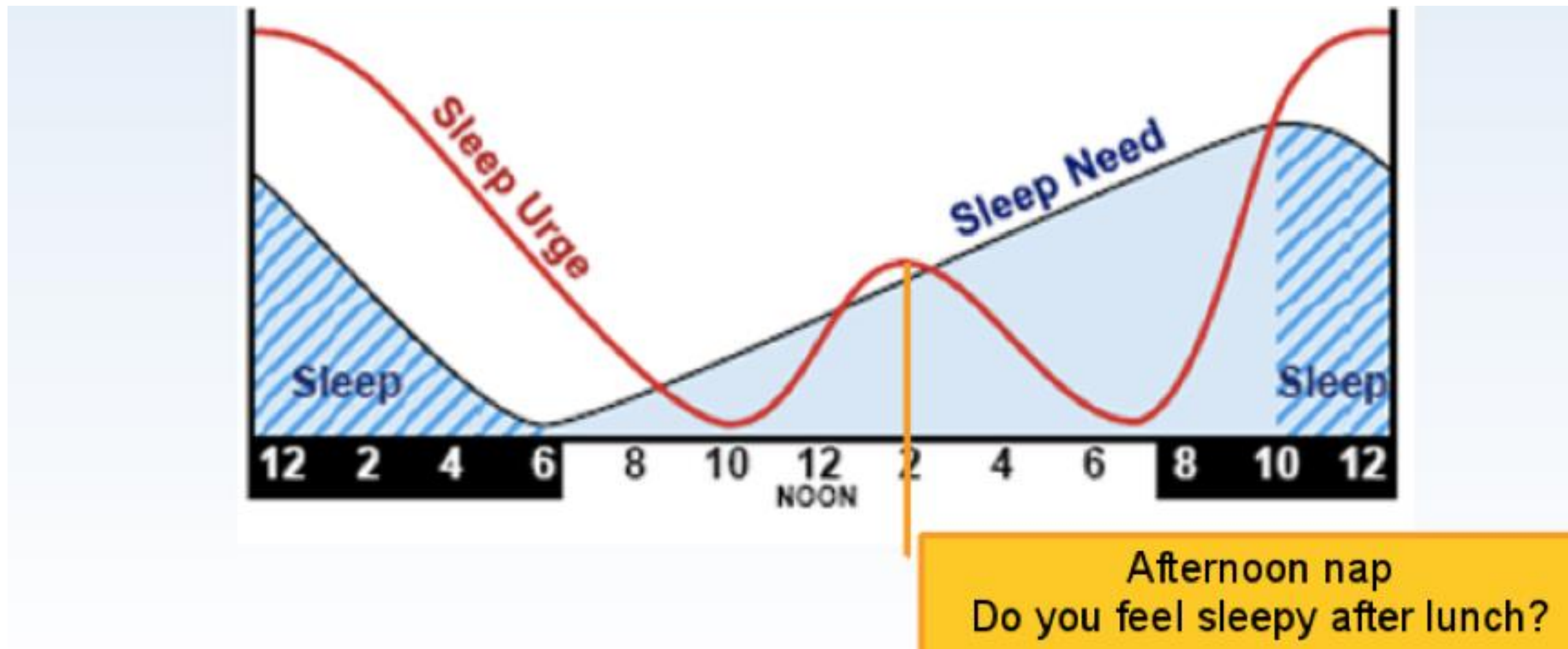
Transport Safety
Research Group

vti

May 2019

Window of Circadian Low (WOCL)

The period of night when sleep is most critical in average fatigue.
02:00-05:59 time zone.



Aviation and Fatigue

- Well establish fatigue management system
- Schedules managed considering jet lag, shift times and commute
- Use of biomathematical fatigue models
- Mature system of close call and reporting of fatigue related events
- Just and fair culture embedded
- Culture of napping
- Limit overload during high-risk operations such as take-off and landing need
- Industry bodies working together to share best practise and learning



Biomathematical Fatigue Models & Fatigue Scales



Samn-Perelli Fatigue Scale

- 1 Fully alert, wide awake**
You are completely awake, alert, and feel no signs of fatigue. You are well-rested and have high mental and physical energy.
- 2 Very lively, responsive, but not at peak**
You are mostly awake but might feel slightly tired or fatigued. Your alertness is generally good, but you may notice a minor decrease in energy compared to being fully alert.
- 3 Okay, somewhat fresh**
You are more awake than asleep, but do feel some fatigue. You might be experiencing some difficulty in maintaining peak alertness and your energy levels are decreasing.
- 4 A little tired, less than fresh**
You are equally awake and asleep, indicating moderate fatigue. You might find it challenging to stay fully alert and drowsiness is becoming more apparent.
- 5 Moderately tired, let down**
You are more asleep than awake and significant fatigue is setting in. Your ability to stay alert and focussed is compromised and you may struggle to remain awake.
- 6 Extremely tired, very difficult to concentrate**
You are mostly asleep but can still be awakened with relative ease. Extreme fatigue has taken over and it is becoming increasingly challenging to stay awake and alert.
- 7 Completely exhausted, unable to function effectively**
You are completely asleep and difficult to awaken. This is the highest level of fatigue. You are in a deep sleep and are not fit for tasks requiring wakefulness.

FRMSc
Fatigue Research & Modelling Centre

Adapted from Cebu Pacific

Reducing Fatigue Risk

ORGANISATIONAL ARRANGEMENTS

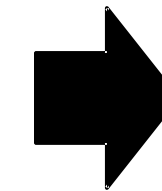
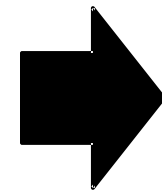
- Treat fatigue as any other safety and health hazard
- Limit duration of on call periods
- Reduce uncertainty – build in a “no contact period”
- Limit out of hours working – “no contact policy” as this can interrupt sleep
- Consider shift duration
- Consider task allocation and time of day
- Be mindful of overtime

INDIVIDUAL ACTIONS

- Sleep (7-9 hours, top up with naps)
- Take regular breaks
- Focus on nutrition & well-being
- Input = Output
- Reduce commuting times
- Employee legal duties (Section 7 HASWA)

Fatigue Risk Management Systems

- Job demands
- Organisational trade-offs
- External factors
- Internal factors
- Inadequate sleep
- Workplace characteristics



Mitigation of risk to performance, safety and health

Investigating Fatigue in Incidents

Step 1

Was the individual likely to have been experiencing fatigue at the time of the incident?



Step 2

Were their actions or decisions a factor in the incident?



Step 3

Were their actions consistent with known fatigue-related impairments?

Sleep opportunity

was the person given the opportunity to get enough sleep to perform effectively?

Sleep quality and quantity

How much sleep did they actually get?

Other reasons for fatigue or sleep loss

Was the person dealing with other causes of fatigue, high workload, insufficient breaks, over time or health?

Signs of fatigue

Did the individual display signs of physical or mental fatigue or indicate that they were fatigued?

Did they show signs of reduced alertness, concentration, increased reaction times, poor memory or decision making, or risk taking?



Fatigue Costs



More than one third of the UK gets less than six hours sleep every night.

Sleep deprivation costs the UK around £40 billion every year.



In the UK, **1 in 5 visits** to the GP are related to tiredness and fatigue



If everyone in the UK had between 6-7 hours sleep every night, this could add around **£24 billion** to the economy.

Fatigue costs the UK between **£115 and £240 million** per year in workplace accidents alone.



Over 50%

of UK employees have experienced burnout at work.

Almost **2/3**

of UK employees claim tiredness affects their productivity at work.

UK employees work the longest hours in Europe but are significantly less productive.

86% of UK employees feel unable to speak with their line manager about how tiredness impacts their performance at work.



Effective Fatigue Risk Management System

Enhances informed
decision-making

Improves safety by
reducing risk of
accidents & incidents

Better resource
allocation resulting in
increased efficiency and
reduced costs

Strengthens the
corporate culture

Good for business!

Any questions?

www.gatewayhsw.co.uk