

Training Package
TP 16/15
Driver Fatigue Management



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Fatigue management

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Purpose

- Fatigue affects a person's health, reduces performance and productivity and also increases the chance of accident occurring. This Fatigue management guide has been developed to help supervisors, managers and drivers to address the issue of fatigue

- This guide is intended to raise awareness, by:
 - Educating on fatigue, how it is caused, and how it affects the human body.
 - describing a risk management process and how it should be applied to best manage fatigue.
 - providing best practice strategies for organizations and individuals to manage fatigue effectively.

Introduction

- Why study truck driver fatigue? How serious is the problem?
 - There have been many fatigue related accidents around the world
 - Falling asleep at the wheel are still a major concern in Asia and internationally.

- **Quote from Dr. Clif Saper – Harvard Medical School**
 - “When we are drowsy, the brain can seize control involuntarily. When the homeostatic pressure to sleep becomes high enough, a couple thousand neurons in the brain’s “sleep switch” ignite.
 - Sleep seizes the brain like a pilot grabbing the controls. If you are behind the wheel of a car, it takes just 3 or 4 seconds to be off the road”.

Fatigue related accidents

- Fatigue related accidents in the U.S. Drowsy drivers are responsible for ;
 - 1/5 of all motor vehicle accidents
 - 8,000 death annually
 - 80,000 drivers fall asleep at the wheel everyday
 - 10% run off the road
 - Every 2 minutes, one of them crashes
 - Countless innocent people are hurt

- Commercial bus/truck drivers survey in Thailand in 2006 (*) has shown that,
 - 1/3 of 69% reported accidents cause by drowsiness.
 - 75% of Drowsy driving and 28% of microsleep
 - 45% of driver excessive daytime sleepiness associated with feeling drowsy , microsleeps and accident.

* J Med Assoc Thai Vol. 89 No. 11 2006

What is Fatigue?

- Fatigue is mental or physical exhaustion that stops a person from being able to function normally which cause by
 - lack of sleep.
 - prolonged periods of physical and/or mental exertion without enough time to rest and recover
 - Long periods of time awake
 - Inadequate amount of sleep
 - Insufficient quality of sleep
- The level of fatigue depend on :
 - Workload
 - Length of the shift
 - Previous hours and days worked
 - Time of day or night worked.

Cause of Fatigue

□ Job Demands

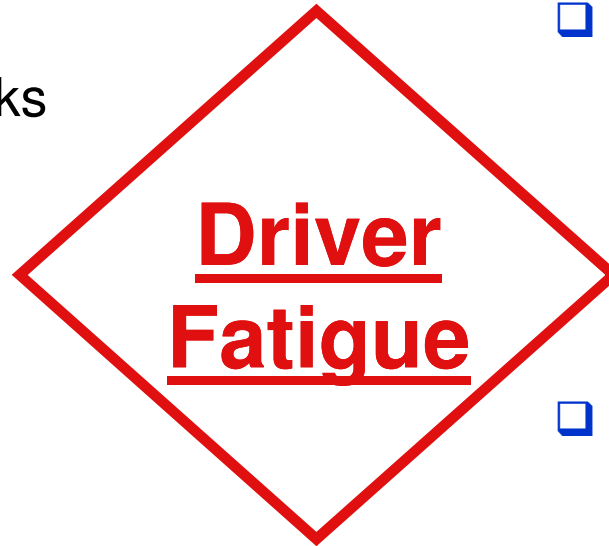
- Workload and breaks
- Shift duration
- Type of work

□ Work Organization

- Trip scheduling
- Work predictability
- Pay system

□ Other

- Illness and/or drugs and medications



□ Human Biology

- Sleep
- Body clock
- Health, age

□ Life Outside Work

- Family and friends
- Commuting
- Standard of living

Acute and chronic fatigue

- ❑ **Acute fatigue** is a short term condition that can be relieved by adequate rest or sleep.
- ❑ **Chronic fatigue** results from repeated and cumulative stress, and may require an extended break, such as a vacation or a holiday.

Physical fatigue

- ❑ A temporary loss of muscle power to respond to demands.
- ❑ A feeling of muscular tiredness, soreness, or other discomfort
- ❑ A decrease in physical performance
- ❑ May have mental components

General or Mental fatigue

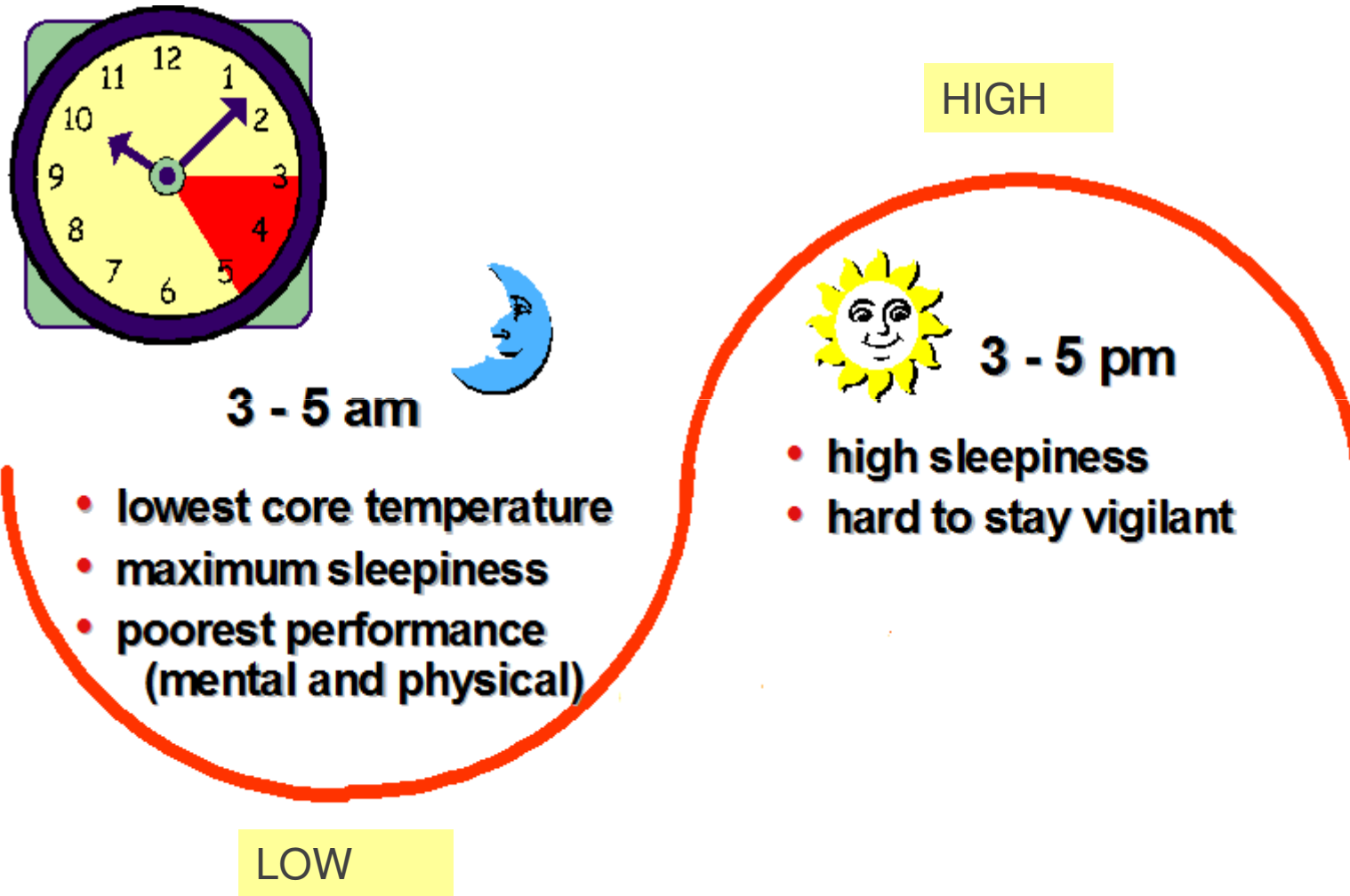
- ❑ Feeling of tiredness after extended or repeated non physical activity performance
- ❑ Feeling of monotony or boredom created by lack of novel stimulation
- ❑ More pronounced if we are tired and drowsy due to loss of anticipated sleep.

Biological Clock and Circadian rhythms

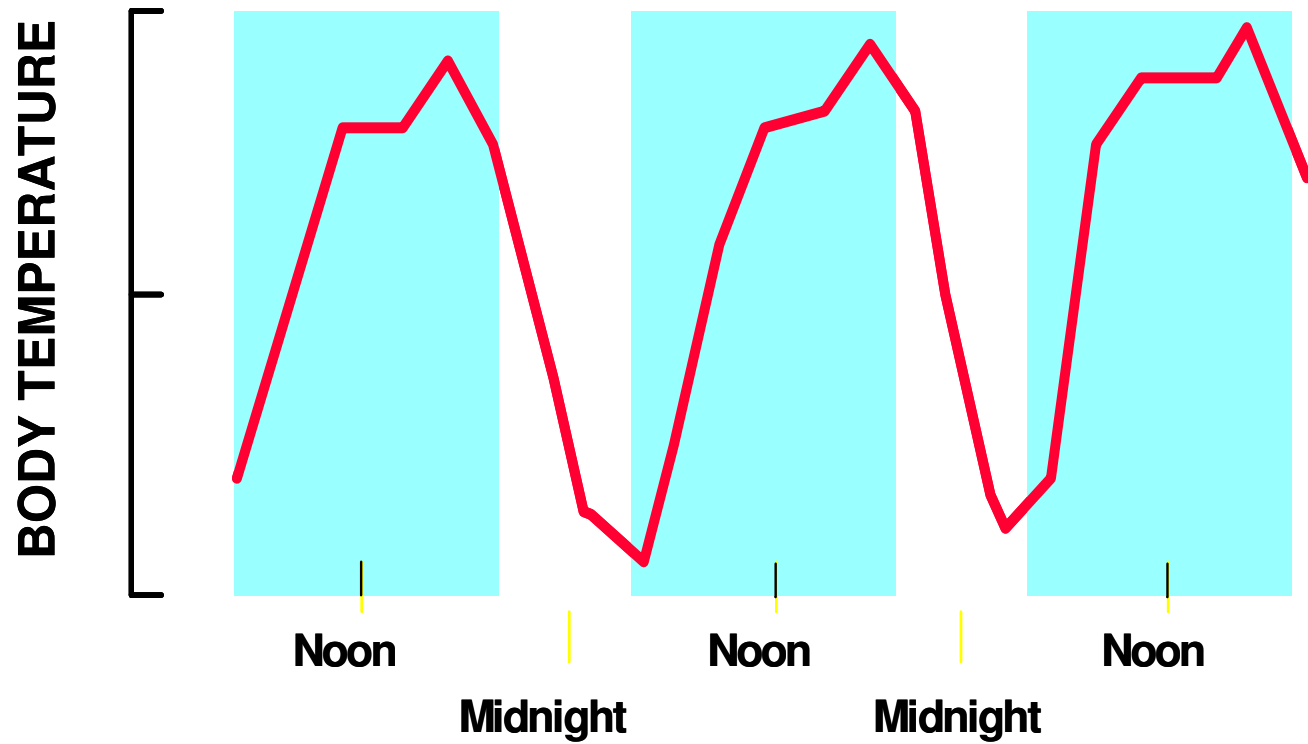
- ❑ Circadian rhythms, or the internal body clock, are the body's natural rhythms that are repeated approximately every 24 hours.

- ❑ Circadian rhythms affect:
 - body temperature
 - digestion
 - hormone levels
 - sleeping patterns
 - many other functions of the human body

Biological clock



Circadian rhythms



Circadian “low points”

- ❑ General “lull” in mid-afternoon and low point after midnight.
- ❑ Decreases in response rates and mental performance
- ❑ Decline in mood and motivation
- ❑ Increased sleepiness and reports of fatigue
- ❑ Working during a circadian lull can affect our performance even if we are not fatigued.

Effects of circadian disruption

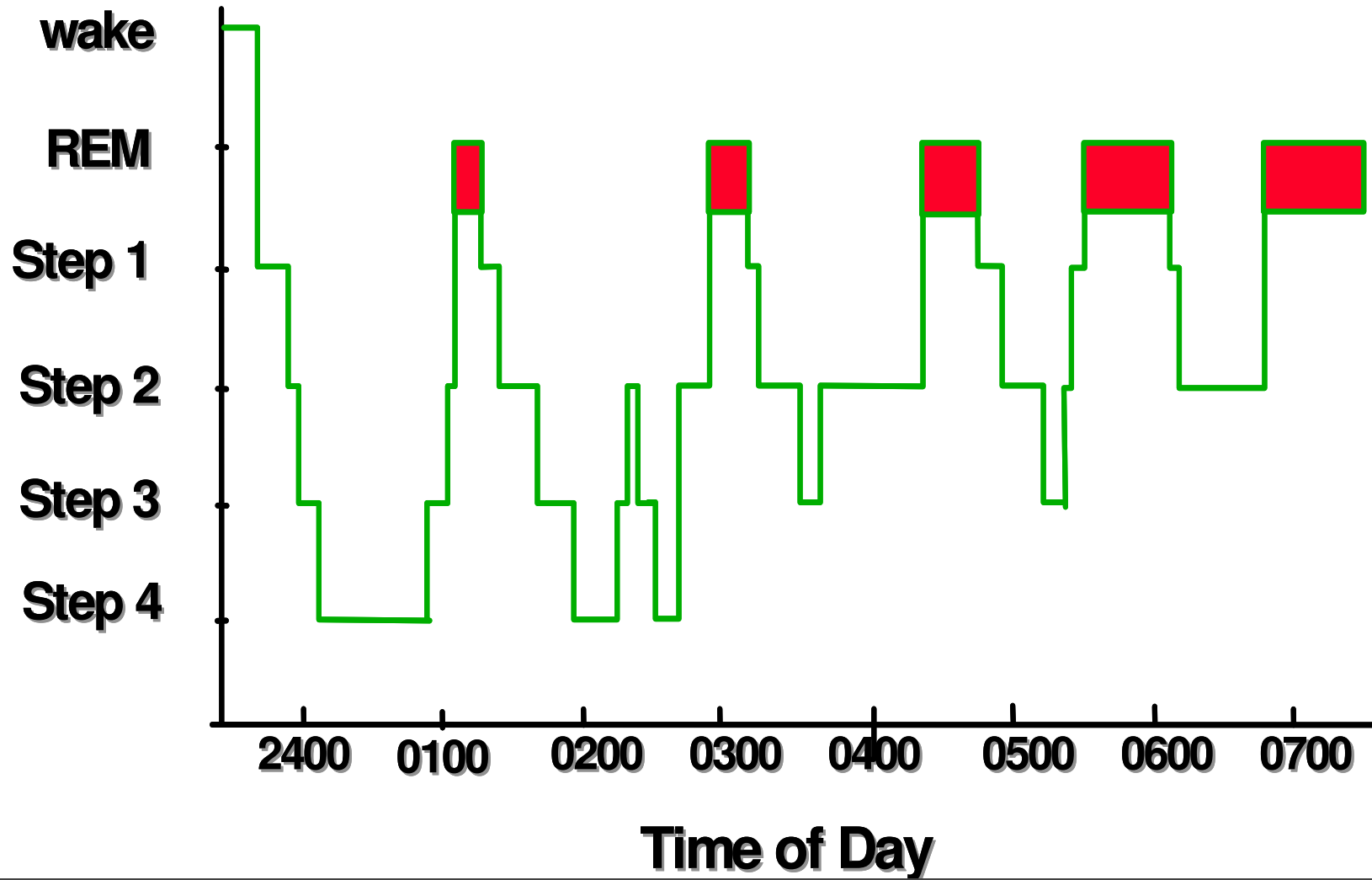
- ❑ Disturbed sleep/inability to fall asleep
- ❑ Increased sleepiness
- ❑ Decreased mental performance
- ❑ Increased reports of fatigue
- ❑ More negative mood
- ❑ Gastrointestinal problems

Sleep

- REM (Rapid Eye Movement) Sleep
 - Brainwaves move quickly with eyes darting under lids
 - Vivid dreams but cannot move voluntarily

- Non-REM Sleep
 - Less brain activity, deep sleep
 - Sleep inertia

Good sleep pattern



Sleep loss and sleep debt

- ❑ Missed sleep or sleep loss is additive, and results in cumulative “sleep debt.”
- ❑ Sleepiness results in decreased physical and mental performance.
- ❑ We pay off sleep debt only by sleeping.
- ❑ Sleep debt requires “recovery sleep,” which is not a one-for-one replacement for missed sleep.

Types of sleep disorder

□ Micro sleep

- Occur when you are fatigued but trying to stay awake to perform a monotonous task like driving or watching computer screen.
- Typically last between 2-30 seconds
- At 60 km/hr a vehicle travels the length of a football field (100 meter) in 5 seconds
- Most likely occur at certain times of day e.g. pre-dawn, mid afternoon.
- Most drivers experience them at some point, often without being aware of the event.

Types of sleep disorder

□ Sleep apnea

- Occurs when the tissue in the back of the throat collapses and blocks the airway.
- Can happen a few times or several hundred times a night.
- Most common in obese, middle age man.
- People with obstructive sleep apnea (OSA) also have high blood pressure

□ Insomnia

- There are 4 kinds of insomnia,
 1. Difficult falling asleep.
 2. Difficult staying asleep.
 3. Waking up to early.
 4. Poor quality sleep.

Types of sleep disorder

□ Narcolepsy

- People affected by excessive sleepiness.
- Often refreshed by short nap but after 2-3 hr, feel sleepy again.
- "Sleep attack" can happen while eating, walking or driving etc.
- As currently no known cure, Organization should test whether drivers have narcolepsy or not before hire .
- These sleep disorder drivers should be tested & treated/ get medical advise. Driver service can be used only after doctor's confirmation that driver is fit for duty

Fatigue as dangerous as alcohol

- Starting at 0600 and finishing at 2300 and 0100 hours
 - BAC of 0.05g/100ml

- Starting at 0600 hours and finishing at 0200 and 0800 hours
 - BAC of 0.10g/100ml.

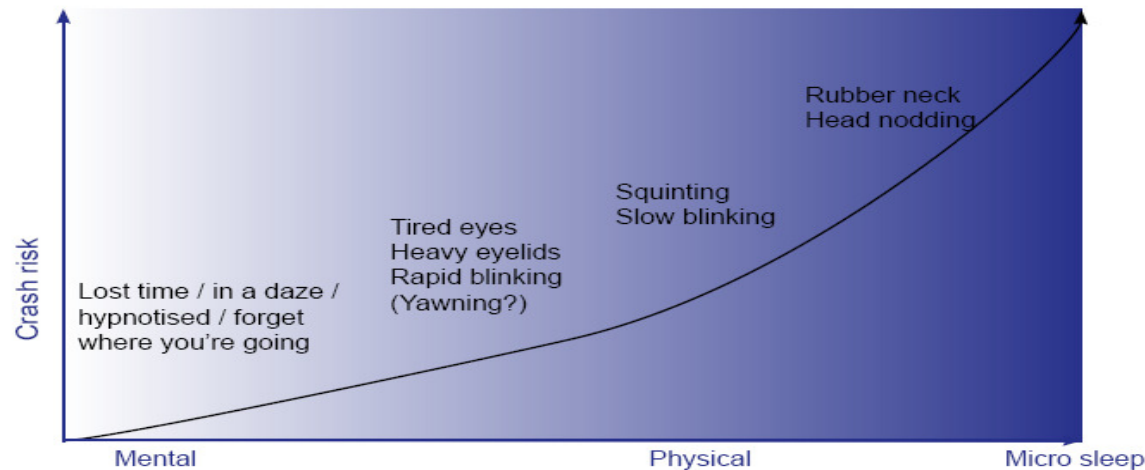
Note : Blood Alcohol Concentration (BAC)



Effects of fatigue

- Alertness and driver performance
 - Effectiveness of Defensive driving is impaired
 - Error, less concentration, poor judgment
 - Slow reactions and decisions;
 - Slow body movements; Hallucinations;
 - Decreased tolerance for other road users;
 - Poor lane tracking and maintenance of headway speed; and
 - Loss of situational awareness.

The 'Fatigue Curve'



Reference : The Dept of Consumer and Employment Protection, Government of Western Australia.

ARE YOU DRIVING **FATIGUED ?**



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Examples of fatigue related accidents within the region



Warning signs of fatigue

- ❑ **Loss of concentration/ Slower reaction times.**
- ❑ **Not remembering driving the last few miles or wandering across the road.**
- ❑ **Nodding off at the wheel (micro sleeps).**
- ❑ **Poor signalling/Paying less attention to traffic.**
- ❑ **Continuously yawning.**
- ❑ **Eyes becoming sore or tired, starting to lose focus or dimmed vision.**
- ❑ **Painful limbs, stiffness and/or cramps**
- ❑ **Tailgating**
- ❑ **Drifting in and out of lanes**
- ❑ **Difficult to maintain speed**

Warning signs of fatigue

- ❑ Apply brake without reason
- ❑ Drive on road shoulder without knowing
- ❑ Shifting in your seat?
- ❑ Open window to get fresh air
- ❑ Close eyes or could not see clearly
- ❑ Other vehicles/drivers getting on your nerves
- ❑ Many car overtaking without notice
- ❑ Could not remember warning sign that just passed

Note: When a driver has these warning signs, drive to the nearest safe parking area and take a rest.

What's Your Fatigue Score?

*If you answered “ YES“ to four
or more of these warning signs,*

YOU ARE EXPERIENCING
SIGNS OF
FATIGUE!



Management role & responsibility

- Fatigue management is the responsibility of all parties
 - Company
 - Manager and supervisor, Scheduler, trip planner and
 - Driver

- Establish and strictly control : Working hour policy
 - Including Contractor
 - Excessive working hours control and monitoring
 - When route planning, must take working hour regulation into consideration
 - When double manning, always ensure both drivers have adequate rest.

Management role & responsibility

□ Night shift work

- Changing between day and night shift, our bodies do not adjust immediately
- First day after shift change is always a high risk. Must be reasonable in length (<10 hr)
- Avoid extend or double shift on the first day of shift change.
- Drivers readiness for duty must be taken into account when calling him up for emergency/ urgent delivery. Minimize changing of shifts.
- Be aware of those returning from long holidays/energetic weekend.
- Schedule so trip times are not extremely “tight”

Management role & responsibility

- Driver educational program about sleep and fatigue prevention
 - Educational programs about sleep, health and safety must be mandatory
 - Both the company and the drivers have shared responsibility to ensure everyone comes to work well rested.
 - There is a high public expectation from our dangerous goods drivers to work well rested and afresh similar as pilots.
 - Make sure open channel for drivers to seek sleep disorder counseling is effective.
 - Keep drivers continually focused and aware of the danger of fatigue when driving.
 - Fatigue related accidents mostly ended as major incidents.

Guideline for drivers : Alcohol

□ Alcohol

- Can help you fall asleep BUT it blocks REM sleep early in the night
- Withdrawal occurs later in the night causing dreams, disturbed sleep
- Drinking alcohol when sleep deprived only make things worse.
- A single beer can have the same impact on ability as 6 packs on someone who is well rested
- Driving the day after a heavy drinking session can leave the driver within alcohol limit but is more disposed to drowsiness.

Guideline for drivers: Sleep Aids

❑ Aids to sleep

- Sleeping pills can have serious limitations as sleep aids.
- Sleeping pills can actually delay the onset of sleep and disrupt sleep quality.
- We may become adapted to sleeping pills, and may experience withdrawal symptoms.

❑ Exercise

- Try to maintain a regular exercise to keep you healthy and fit.
- Avoid any excessive exercise within six hours of your bedtime.

❑ Eating habits

- A heavy meal before or during the trip is likely to induce drowsiness while driving.
- Avoid unbalance food e.g. high calorie/carbohydrate.

Guideline for drivers : Power Naps

- ❑ Always plan the journey to include 15-20 minutes break every 3-4 hours
- ❑ Find a safe place to stop as soon as possible if you feel drowsy.
- ❑ Recommendation is to drink a cup (or 2) of coffee or a high caffeine drink then take a short nap to allow time for the caffeine to kick in.
- ❑ Other remedies don't work effectively.

Driver's obligations

- ❑ Driving a large size vehicle is difficult and involves a high degree of responsibility.
- ❑ As a professional dangerous goods vehicle driver it is YOUR responsibility to report to work in a fit condition.
- ❑ As a professional driver it is extremely irresponsible to work while fatigue. Remember
- ❑ It's not just your life you're risking!!

Driver's obligations

- ❑ All 'falling asleep at the wheel' accidents are preventable.
- ❑ Stop and drink a cup of coffee before taking a 15 minutes nap will make sure you wake up afresh to continue your journey safely.
- ❑ Forcing yourself to gain a few more miles or past through one more intersection while being fatigued, you may never reach your destination at all.

Thank you



Be alert - get your 10 hours rest



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