

# Fatigue Management



## Couple of takeaways

- Fatigue is a feeling of constant tiredness or weakness and can be physical, mental or a combination of both.
- Fatigue can increase the risk of incidents due to lack of alertness and can result in slower reaction to certain incidents.
- As part of our overall commitment to the health and safety of our workers, the public and other stakeholders who are affected by our actions, Hydro Tasmania group actively works to minimise the risks associated with workplace fatigue.

- The maintenance of a safe working environment and operations by minimising hazards associated with fatigue
- Planned working hours consider the guidelines provided within this standard
- Assistance through a range of preventative initiatives is offered including education and training strategies that help manage fatigue and related issues
- Ongoing risk assessment and hazard monitoring takes place
- Workers who are deemed consistently unfit for work because of fatigue are managed consistently and fairly in accordance with our values and this standard
- All workers take personal accountability in ensuring fatigue is identified and management practices and mitigations are effective and applied.

## Notes:

Information provided within this procedure is general in nature and should not be seen as a substitute for professional medical advice. Ongoing concerns about sleep or other medical conditions should be discussed with a representative from the Healthy Business Group or your medical practitioner. Employee benefits and conditions contained in the Enterprise Agreement are not within scope of this standard. However, in establishing fatigue management plans or considering measures to mitigate the management of fatigue, the established benefits and conditions within the Enterprise Agreement must be considered and applied where applicable.



## What is this procedure for?

This procedure provides a system to ensure that the responsibilities for minimising the risks of fatigue are clearly assigned, and that strategies are implemented to support workers in carrying out these responsibilities.

The objectives of this procedure are to ensure:

- Workers understand the need to be fit for work

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## How does fatigue occur?

### Fundamental fatigue principles

The risks associated with shift related fatigue may increase, whenever any of the following occur:

- More than 48 hours worked per 5-day week
- Shift duration more than 12 hours
- The worker has not had a reasonable break between consecutive shifts: (e.g., at least 10 consecutive hours off duty)
- More than 12 hours night work per week (between 9pm and 9am)
- A roster of 8 shifts worked in nine consecutive days without a break.

When one or more of these occur, mitigation measures may need to be implemented.

### Biological and social factors

In determining adequate sleep opportunity, work supervisors should give due consideration to biological and social factors that might influence the amount of sleep obtained.

### Biological factors include:

- Time of day
- Previous sleep / wake periods

### Social factors include:

- The need to undertake activities of daily living
- The needs to engage in normal family and social obligations.

### Travel

Jet lag disrupts the normal hours of rest which leads to extreme tiredness and other physical effects felt by a person due to long flight across different time zones. The principles for fatigue risk calculation remains the same but quality of sleep is impacted. Some strategies to manage this include:

- For short trips, stay on home time - If you are away from home for an only a day or two, try to eat when you would usually eat at home, try to sleep when you would usually sleep at home and try to not go outside when it is dark at home
- For longer trips, change your time as soon as possible - if you are away for more than two or three days, start using the time at your destination as soon as possible. Change your watch on the flight. Try to eat and sleep on the plane at times when you would eat and sleep at your destination. The earlier you start, the easier it will be
- Give yourself time - remember that you will still have a "slump time" when your body is telling you that you would be asleep if you were at home. Adjusting to your new time zone usually takes at least 2 or 3 days

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- Take short naps - while you are adapting to your new time zone, short naps may help you feel more alert and perform better. It is important that you sleep for no longer than 30 minutes and that you are awake for at least 4 hours before you go to bed
- Caffeine may be helpful but - do not overdo it. Tea and coffee can help improve alertness. Remember that they take about 20 minutes to have an effect, which then can last up to 4 hours. Do not have tea or coffee for at least 2 hours before going to bed
- Alcohol is not the solution - although it may help you to get off to sleep, you will not sleep as well during the night
- Minimise use of sedatives and sleeping tablets - they can become a habit, giving you more problems than temporary jet lag
- Melatonin - this may help to re-set your body clock. Seek medical advice if you see the need to take this supplement
- Go outside - take a walk. Sunlight is important to help your body adjust to the local time zone
- Do some exercise - this will help to revitalise when you arrive and reset your body clock. You should exercise during daylight hours, particularly in the early morning or late afternoon and not too close to bedtime.

## Incentives

Self-assessment results derived from the Basic Sleep Formula need to be assessed by the immediate work supervisor to determine if any underlying incentives may have skewed the results e.g. inducements such as paid

overtime may override an individual's capacity to undertake a reliable self-assessment. The immediate work supervisor should foster a culture of trust that allows for reliable assessments to be conducted ensuring that fatigue risks are realised and effectively managed accordingly.

## Basic sleep formula

$$W1 < S1 + S2 (=S3) > 12$$

### Legend

*W1 - Number of hours from time of waking to time returned home from work*

*S1 - Number of hours sleep in the last 24 hours (S1 should be at least 5 hours)*

*S2 - Number of hours sleep in the previous 24-hour period (S2 should be at least 6 hours)*

*S3 - Number of hours sleep in the last 48 hours (S3 should be at least 12 hours)*

This means that an individual should ensure that they have had at least 12 hours sleep in the 48 hours prior to starting work. The time from waking up, to the time they arrive home should not exceed S3. If it is greater, then the person may be at risk from fatigue, and mitigation measures may need to be implemented.

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## How do we manage fatigue?

**Level 1 management** shall ensure that a fatigue risk management plan (FRMP) is developed for their areas of responsibility so that risks associated with fatigue are effectively managed:

- Ensure FRMPs are reviewed and modified as necessary to reflect changes in work, and improvements in the methods of fatigue management
- Ensure that systems are in place and knowledge imparted for fatigue issues to be appropriately managed
- Ensure compliance with the FRMP by those who allocate or schedule work
- Ensure that all workers, for whom fatigue is a potential safety hazard, successfully complete a training program that enables them to:
  - a. Identify the risks associated with fatigue
  - b. Identify and implement appropriate strategies for minimising fatigue related risk

**Work planner** shall plan and schedule the assistance plan and schedule work with fatigue risk management plans in mind.

**Hydro Tasmania group job manager or line manager** shall authorise the assistance to be provided supervise the assistance.

**WHS Team** shall ensure that training material is current and of an appropriate quality:

- Ensure safety systems are kept up to date in relation to fatigue as a hazard
- Ensure data is routinely analysed with specific reference to fatigue and ensure that this standard is reviewed as stipulated
- Provide resources for advice and support for fatigue management.

Develop an appropriate management system for:

- Quantifying and reporting the risks associated with work practices
- Determining the extent to which fatigue may contribute to accidents and injuries within the workplace
- Continuing to review, monitor and improve fatigue management practices
- Monitoring fatigue issues.

**Line management** shall develop (in consultation with workers) an appropriate fatigue risk management plan (FRMP) to identify, assess and manage the risks associated with fatigue:

- Use risk assessments to identify tasks where impaired fitness for work could:
  - Produce a potential threat to health and safety of workers
  - Cause significant equipment / plant damage

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- Cause a significant environmental impact and implement control measures and / or fatigue prevention
- Be responsible for designing and setting sustainable rosters / shifts
- Design working hours to allow for reasonable sleep opportunities that take into consideration the biological and social factors
- Ensure that fatigue management training is conducted for all workers and refresher courses are conducted as appropriate
- Monitor the application of the FRMP in the workplace
- Act on fitness for work concerns raised by workers
- Advise that medical assistance or counselling is available.

Person responsible for conducting tasks (e.g. Project Manager, Production Manager) shall:

- Use risk assessments to identify changes in project or production tasks where impaired fitness for work is considered an unacceptable risk to health, safety or environment or a potential threat to equipment / plant damage and initiate implementation control measures and / or fatigue prevention
- Be responsible for designing and setting sustainable rosters / shifts
- Monitor working hours to ensure reasonable sleep opportunities are applied and take into consideration biological and social factors
- Ensure that fatigue management training is conducted for all workers and refresher courses are conducted as appropriate

- Monitor the application of the FRMP in the workplace.

**Workers** shall minimise the risks associated with non-work-related sources of fatigue, as well as those that may arise during the normal course of work and travelling to and from work:

- Ensure they understand and execute their responsibilities with respect to appropriate sections of the FRMP
- Ensure they successfully complete all relevant training with respect to fatigue management
- Conduct periodic "self-assessments" using the Basic Sleep Formula and utilising their training to identify, report and manage any actual or potential risks likely to be associated with fatigue.

Use their allocated time away from work to obtain an amount of sleep sufficient to minimise the risk of becoming fatigued at work or when travelling to and from work.

Note: The definition of sufficient sleep will be included in the FRMP

- Report to the appropriate work supervisor if they consider themselves not to have obtained sufficient sleep, as per the Basic Sleep Formula or are symptomatic of a "fatigue impaired state"
- Ensure where other factors may impact on an individual's capacity to endure demands, such as low / high temperature, high humidity, exposure to the effects of the sun, dust, and extended driving, that

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appropriate response is taken to ensure personal safety to the individual and that of others.

**Line manager** shall ensure that a fatigue risk management plan is in place for their areas of responsibility so that risks associated with fatigue are effectively managed

- Determine whether workers' behaviour is consistent with FRMP
- Ensure that the necessary assessment and action is taken to identify and / or manage a worker who is in a fatigued state
- WHS Team shall maintain and review WHS documentation and communicate and provide training in the application of WHS processes.

## Fatigue points system

When the sleep formula is broken, fatigue starts to rise. To assist all workers including managers in calculating accurate fatigue levels, a fatigue points system, based on research from the sleep research centre, University of South Australia, will be used. Fatigue points will be accrued for lack of sleep of the following limits:

- Two points for every hour of sleep less than 5 hrs for S1
- One point for every hour of sleep that S3 is less than 12 hrs
- One point for every hour that W1 more than S3

## Fatigue calculation

Workers calculate their fatigue levels by using either a fatigue risk assessment (fatigue risk calculation matrix) or Hydro Tasmania group's fatigue calculator prior to and at agreed times during emergency work.



Figure 1 HTs Fatigue Calculator

If an elevated fatigue risk is recognised by a worker having a medium or high fatigue score or it is recognised that the work will extend into a high fatigue score, the work supervisor should decide as to whether the continuation of work has greater implication to safety than the elevated fatigue level of the worker. The decision to proceed with work should then be made. The outcomes must be documented prior to work

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commencing. The following strategies should be considered and implemented if work is going ahead and there is elevated fatigue risk:

- Appoint a team member who does not have an elevated fatigue risk to monitor other workers
- Partner workers during work to encourage close monitoring
- Rotate workers within the team between work and different tasks
- Implement an additional worker to do a second check when important decisions are made
- Avoid high risk activities for workers with an elevated fatigue risk
- Ensure other workers without an elevated fatigue risk complete all high-risk activities
- Delegate tasks according to fatigue risk to reduce hazard exposure

Accrued Fatigue Points	Level of Risk	Level of Mitigation Strategy to Use
>3	Low	No Action
= / < 3	Moderate	Self-Management Strategies
3 - 7	High	Joint Decision-Making Strategies with Management as per Bus. Unit / Project FRMP
8+	Extreme	Cease Work and instigate mitigation Strategies with Management as per Bus. Unit / Project FRMP

Table: Fatigue points and mitigation strategies

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## Fatigue risk management plans (FRMPs)

The Business unit / project FRMP is the principal document that demonstrates how fatigue will be managed in that workplace, and the mitigation strategies that will be used to manage the fatigue related risk. A FRMP should identify:

The tasks in a job which are higher risk than others. This should be done in consultation with workers. Typical high-risk tasks may include, but are not limited to:

- Driving when the S1 + S2 principle has been violated
- Diving or working in fall arrest
- Working on or in proximity to exposed live electrical parts
- Performing isolations (PTW)
- Conducting pre-commissioning testing

The strategies to be used to minimise the risks of performing higher risk tasks when the worker is fatigued may include, but are not limited to:

- Being assigned or rotated through to a lower risk task
- Making rest facilities available so the workers can have a recovery nap, particularly where delays to work start can be anticipated due to operational constraints etc. These may also be useful when work continues for much longer than planned (e.g., emergency restoration works)

- Establishing if the work can be deferred
- Rotating with a fresh crew
- Having 2 or more workers work on a task so they can check each other's actions.

The overall emphasis is to identify what is at risk and develop simple measures to mitigate.

The strategies which will minimise the risks of fatigue, include, but are not limited to, techniques such as:

- Not scheduling work to start before 6.00am (people normally sleep best between 12pm and 6am and ad hoc interruptions to this sleep period can be detrimental to sleep quality)
- Monitoring work times to ensure workers have a minimum 10-hour break between shifts and effective planning and resourcing work within a 12-hour period
- Arranging alternate methods of transport (e.g., taxi or hire bus) when required i.e., when the S1 principle has been breached
- Rotating workers through repetitive and mundane tasks
- Taking appropriate measures to minimise the effects of cold / heat, humidity and exposure to the sun or excessive manual tasks.

The FRMP shall also consider and address the fatigue related to heavy vehicles as outlined in the following section, Heavy vehicles (fatigue management).

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**Heavy vehicles (fatigue management):** The following section only applies to fatigue regulated heavy vehicles which include:

- A vehicle with a Gross Vehicle Mass (GVM) of over 12t
- A combination when the total of the GVM is over 12t
- Buses with a GVM over 4.5t fitted to carry more than 12 adults (including the driver)
- A truck or a combination including a truck, with a GVM of over 12t with a machine or implement attached.

Driver fatigue or drowsy driving is an important safety hazard for the road transport industry. The main causes of 'drowsy driving' are not enough sleep, driving at night (when you should be asleep) and working or being awake for a long time. Some heavy vehicles are not classed as fatigue-regulated heavy vehicles. These include trams, motor vehicles modified to primarily operate as a machine or implement (plant such as agricultural machinery, bulldozers, tractors, etc.) and motor homes specifically modified for residential purposes (not just built with a sleeper berth).

## Heavy vehicle records management

Drivers of fatigue-regulated vehicles who

- Drive more than 100km radius from their home base
- Operate under standard hours, basic fatigue management or advanced fatigue management

## Record keeping - drivers

Drivers must record work and rest times, and other prescribed details, in a work diary for each day they operate 100+km from base, or under a BFM, an AFM or class exemption. They must also carry their work diary if in the last 28 days they have operated 100+km from base, or under a Basic Fatigue Management, an advanced fatigue management or class exemption. Drivers have 21 days to return duplicate copies of diary work sheets to their nominated record keeper.

## Record keeping - driver's record keeper

Irrespective of whether a driver is using a work diary, the driver's record keeper must record and keep information for each day that a driver drives a fatigue regulated heavy vehicle, including - driver's name, registration number of each vehicle driven by each driver, driver timesheets, work diary sheets where required, License contact details, rosters, and trip schedules - including changeovers, pay records and drivers work and rest time tallies for each day and each week.



## What are the standard hours of work?

Under standard hours there are only two categories of time. These are work and rest.

Note: work is driving, and any other task connected with the vehicle, e.g. loading, mechanical repairs, or operating ancillary equipment attached to the vehicle (such as a concrete pump)

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Work time in a 24-hour period is a maximum of 12 hours and this includes both driving and non-driving work (e.g. loading a vehicle, mechanical repairs, refuelling) The standard Hours of operation (refer Heavy Vehicle National Law Act 2012 Heavy Vehicle (Fatigue Management) National Regulation) shall apply with a maximum hours of work time of 12 hours. Where work is not directly relating to the vehicle such as driving, loading inspection, refuelling and record keeping etc. Fundamental fatigue principles shall apply.

Refer to the National Heavy Vehicle Regulator for more information - [www.nhvr.gov.au](http://www.nhvr.gov.au) - or refer to the Regulator's call centre: [info@nhvr.gov.au](mailto:info@nhvr.gov.au) or phone 1300 696 487



## How do we manage fatigue during emergency?

In Emergency situations, it is recognised that priorities related to restoration activities exist, which may require a worker to work at an elevated fatigue risk. In these cases, this risk must be mitigated to as low as reasonably practicable to reduce the likelihood of hazards impacting on workers, the public and the outcome of the emergency response work while a worker is acknowledged to be in an elevated risk of fatigue. If an elevated fatigue risk is recognised by a worker having a medium or high fatigue score or it is recognised that the work will extend into a high fatigue score, the work supervisor or a member of the Emergency Management Team should decide as to whether the network emergency has greater implication to safety than the elevated fatigue levels of the emergency response team. The decision to proceed with work should

then be made. The outcomes must be documented prior to work commencing. FRMPs should be included in the emergency management plan to identify potentially hazardous situations so as they can be effectively managed. The FRMP should be initially and continually reviewed during the emergency. The following strategies should be considered and implemented if emergency work is going ahead and there is elevated fatigue risk:

- Appoint a team member who does not have an elevated fatigue risk to monitor (directly or remotely) the fatigue of other team members
- Continue to closely monitor fatigue levels amongst team members
- Schedule work to allow workers to have a break or 'nap' before work commences
- Partner workers during work to encourage close monitoring
- Have onsite facilities to allow for workers to have 15 minutes rest breaks or 'power naps' during works
- Arrange for a new team to take over emergency response work when possible
- Rotate workers within the team between work and different tasks
- Implement an additional worker to do a second check when important decisions are made
- Avoid high risk activities for workers with an elevated fatigue risk
- Ensure other workers without an elevated fatigue risk complete all high-risk activities

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## Appendix 1

## Scenario - Applying the Basic Sleep Formula

A Worker is calculating their fatigue points using the Basic Sleep Formula

It is 8pm and the worker woke this morning at 6am, therefore he / she has been awake for 14 hours. (W1 =14)

The worker had 4 hours sleep in the last 24 hours (S1 = 4)  
5 hours sleep in the previous 24 hours (S2 =5)

Therefore  $(S_3 = S_1 + S_2 = 9)$

## Calculation

- a) The worker accrues 2 points for loss of 1 hour sleep less than 5 hrs in the last 24 hours ( $S1 = 4$ )
- b) The worker accrues 3 points for loss of 3 hours sleep less than 12 hrs for last 48 hours ( $S3 = 9$ )

The worker accrues 5 points for 5 hours awake today (W1=14) more than (\$3 = 9).

Accrued Fatigue Points for the worker = 10  
Level of Risk = High

REQUIRED LIMITS		ACTUAL HOURS	ACCRUED FATIGUE POINTS
S1	5	4	2
S2	N / A	5	No points
S3 (S1+S2)	12	9	3 (12 - 9)
W1	Same as S3	14	5 (14 - 9)
		Total Points	10

ACCrued Fatigue Points	Level of Risk	Level of Mitigation Strategy to Use
<3	Moderate	Self-Management Strategies
3 - 7	High	Joint Decision-Making Strategies with Management as per Bus. Unit / Project FRMP
8+	Extreme	Cease Work and instigate mitigation Strategies with Management as per Bus. Unit / Project FRMP