DRAFT

Code of Practice

PREVENTING AND MANAGING FATIGUE IN THE WORKPLACE

safe work australia

Table of Contents

FOREWORD

This Code of Practice on how to prevent and manage fatigue is an approved code of practice under section 274 of the *Work Health and Safety Act* (the WHS Act).

An approved code of practice is a practical guide to achieving the standards of health, safety and welfare required under the WHS Act and the Work Health and Safety Regulations (the WHS Regulations).

A code of practice applies to anyone who has a duty of care in the circumstances described in the code. In most cases, following an approved code of practice would achieve compliance with the health and safety duties in the WHS Act, in relation to the subject matter of the code. Like regulations, codes of practice deal with particular issues and do not cover all hazards or risks which may arise. The health and safety duties require duty holders to consider all risks associated with work, not only those for which regulations and codes of practice exist.

Codes of practice are admissible in court proceedings under the WHS Act and Regulations. Courts may regard a code of practice as evidence of what is known about a hazard, risk or control and may rely on the code in determining what is reasonably practicable in the circumstances to which the code relates.

Compliance with the WHS Act and Regulations may be achieved by following another method, such as a technical or an industry standard, if it provides an equivalent or higher standard of work health and safety than the code.

An inspector may refer to an approved code of practice when issuing an improvement or prohibition notice.

This Code of Practice has been developed by Safe Work Australia as a model code of practice under the Council of Australian Governments' *Inter-Governmental Agreement for Regulatory and Operational Reform in Occupational Health and Safety* for adoption by the Commonwealth, state and territory governments.

A draft of this Code of Practice was released for public consultation on 26 September 2011 and was endorsed by the Select Council on Workplace Relations on [*to be completed*].

SCOPE AND APPLICATION

This Code provides practical guidance for persons conducting a business or undertaking and other duty holders under the WHS Act on how to prevent and manage fatigue in the workplace.

The guidance in this Code is generally applicable to all types of work and all workplaces covered by the WHS Act, including workplaces that are mobile, temporary and remote. However, it does not cover specific information on how to manage fatigue under road transport heavy vehicle driver fatigue laws. This information is available in the National Transport Commission's *Guidelines for Managing Heavy Vehicle Driver Fatigue*.

This Code can also be used by managers, supervisors, workers (including volunteers and contractors), health and safety representatives and other persons at the workplace to assist in eliminating or minimising the risks associated with fatigue in the workplace.

How to use this code of practice

In providing guidance, the word 'should' is used in this Code to indicate a recommended course of action, while 'may' is used to indicate an optional course of action.

This Code also includes various references to provisions of the WHS Act and Regulations which set out the legal requirements. These references are not exhaustive. The words 'must', 'requires' or 'mandatory' indicate that a legal requirement exists and must be complied with.

1. INTRODUCTION

1.1 What is fatigue?

Fatigue is an acute, ongoing state of tiredness that leads to mental or physical exhaustion and prevents people from functioning within normal boundaries. It is more than feeling tired and drowsy, it is a physical condition that can occur when a person's physical or mental limits are reached.

Fatigue can occur as a result of various factors that may be work-related, lifestyle-related or a combination of both. Work-related factors can include:

- working time
- scheduling and planning (for example, roster patterns, length and timing of shifts)
- inadequate rest breaks
- lengthy periods of time being awake
- insufficient recovery time between shifts
- payment incentives that may lead to working longer shifts
- environmental conditions (for example, climate, light, noise, workstation design)
- type of work being undertaken (for example, physically or mentally demanding work)
- work demands placed on the person (for example, timeframes, deadlines, intensity)
- the organisation's culture, and
- the person's role within the organisation.

Lifestyle-factors can include:

- inadequate or poor quality of sleep due to sleep disorders (for example, sleep apnoea)
- social life
- family responsibilities
- other employment
- travel time (may be considered work time in some cases), and
- health and wellbeing (for example, nutrition and diet, exercise, pain, illness).

How can you tell someone is fatigued?

A person can display the following signs which could mean they are fatigued:

- headaches and/or dizziness
- wandering or disconnected thoughts, daydreaming, lack of concentration
- blurred vision or difficulty keeping eyes open
- constant yawning, a drowsy relaxed feeling or falling asleep at work
- moodiness, such as irritability
- short term memory problems
- low motivation
- hallucinations
- impaired decision-making and judgment
- slowed reflexes and responses
- reduced immune system function
- increased errors
- extended sleep during days off work
- falling asleep for less than a second to a few seconds, and being unaware they have done so (otherwise known as micro-sleeps), and
- drifting in and out of traffic lanes or missing gear changes and turn offs when driving.

Sleep and fatigue

Sleep is the only effective long term strategy to prevent and manage fatigue. While tired muscles can recover with rest, the brain can only recover with sleep. The most beneficial sleep is a good night's sleep taken in a single continuous period.

The optimum amount of sleep varies for each person, however, an adult generally requires 7 to 8 hours of sleep daily. When individuals get less sleep than they need in a day, they build up a sleep debt which accumulates until they can get enough sleep to overcome the sleep debt. Each additional day without enough sleep increases the debt, and when it becomes large enough fatigue can occur. It may take several days before a person recovers from a sleep debt. Sleep debt is common with night shift workers as they often have difficulty having sufficient and undisturbed sleep during the day.

One sleepless night can be affected in a similar way as someone who has been drinking alcohol, for example:

- being awake for 17 hours is the equivalent of having a blood alcohol level of 0.05
- being awake for 20 hours is the equivalent of having a blood alcohol level of 0.1

Shift workers (including night work) and fatigue

The body has a natural rhythm that is repeated every 24 hours – this is known as our 'body clock'. Our body clock regulates functions including sleeping patterns, body temperature, hormone levels and digestion. As it is programmed for different levels of wakefulness, we experience different levels of alertness depending on the time of the day.

When the human body clock is out of step, our alertness decreases and as a result we feel fatigued. This increases the risk of making errors and causing accidents and injuries, either in the workplace or on the way home from work.

Shift workers are one of the main worker groups affected by fatigue. Body clock rhythms do not generally adjust easily to shiftwork. In many workplaces shift work, and particularly night work is unavoidable and therefore fatigue should be proactively managed.

Sleep disruption is the most common problem for shift workers as a sleep cycle is usually shorter after working a night shift or if work begins before 7am. The level of tiredness increases with the number of hours worked and is more pronounced during the second half of the shift, especially between 2am and 6am and 2pm and 4pm.

1.2 Why is fatigue a problem?

Fatigue has obvious implications for the workplace and for public safety and can affect a person's performance within the workplace. There is the potential for an increase in accidents and injuries to occur. For example:

- when operating machinery and driving vehicles
- when undertaking critical tasks that require a high level of concentration
- where the consequence of error is serious, and
- when undertaking night work when a person would ordinarily be sleeping.

The effects of fatigue can be short or long term, for example, a person can have:

- difficulty in concentration and be easily distracted
- poor judgment and decision making
- reduced capacity for effective interpersonal communication
- reduced hand-eye coordination and visual perception
- reduced vigilance
- slower reaction times, and
- reduced memory.

Longer term health effects can include heart disease, diabetes, high blood pressure, gastrointestinal disorders, lower fertility, anxiety and/or depression.

Shift workers and former shift workers show more signs of ill health than people on fixed day work. Health problems may appear after a short stint of shift work, or may be only apparent after some years.

1.3 Who has health and safety duties in relation to managing fatigue?

Everyone in the workplace has a health and safety duty to prevent and manage fatigue.

A **person conducting a business or undertaking** has the primary duty under the WHS Act to ensure, so far as is reasonably practicable, that workers and other persons are not exposed to health and safety risks arising from the business or undertaking.

The duty includes a requirement to ensure, so far as is reasonably practicable,

- the provision and maintenance of a work environment that is without risk to health and safety
- the provision and maintenance of safe systems of work, and
- the health of workers and the conditions of the workplace are monitored for the purpose of preventing illness or injury.

A person conducting a business or undertaking may be an employer, self-employed, a principal contractor, a person with management or control of a workplace, a designer, manufacturer, supplier, importer or installer.

Officers, such as company directors, must exercise due diligence to ensure the business or undertaking complies with the WHS Act and Regulations. This includes taking reasonable steps to ensure the business or undertaking has and uses appropriate resources and processes to eliminate hazards or minimise risks associated with fatigue.

Workers must take reasonable care for their own health and safety and must not adversely affect the health and safety of other persons. Workers must also comply with any reasonable instruction and cooperate with any reasonable policy or procedure relating to health and safety at the workplace, including policies for preventing and managing fatigue.

1.4 What is involved in preventing and managing fatigue?

A step by step process

The steps that need to be taken to prevent and manage fatigue will vary from one workplace to the next, depending on the nature of the work, environmental conditions and individual factors.

The best way to address fatigue and other hazards at the workplace is to follow a risk management approach, which involves the following four steps:

- identify hazards that can contribute to fatigue
- assess the risks of these hazards
- implement and maintain risk control measures, and
- review the effectiveness of the control measures.

Further guidance on the risk management process generally is available in the *Code of Practice: How to Manage Work Health and Safety Risks.*

Consulting workers

Consultation involves sharing of information, giving workers a reasonable opportunity to express views and taking those views into account before making decisions on health and safety matters.

The WHS Act requires that you consult, so far as is reasonably practicable, with workers who carry out work for you who are (or are likely to be) directly affected by a work health and safety matter.

If the workers are represented by a health and safety representative, the consultation must involve that representative.

Consultation with workers and their health and safety representatives must occur:

- when the organisation identifies fatigue is a hazard in the workplace
- when the organisation checks how fatigue is currently managed
- when changes are proposed to working hours, work schedules and working procedures
- prior to new work schedules and working procedures being introduced
- each step of the risk management approach
- where there are indications of fatigue affecting the health and safety of workers, and
- after an incident (or 'near miss') occurs.

Consulting, co-operating and co-ordinating activities with other duty holders

A person conducting a business or undertaking must consult, co-operate and co-ordinate activities with all other persons who have a work health or safety duty in relation to the same matter, so far as is reasonably practicable.

Sometimes you may have responsibility for health and safety together with other business operators who are involved in the same activities or who share the same workplace. In these situations, you should communicate with each other to identify and assess health and safety risks associated with fatigue and work together in a co-operative and co-ordinated way so that these risks are eliminated or minimised so far as is reasonably practicable.

For example, if your business involves providing on-hire workers who carry out shift work for a host business, you have a duty of care as well as the host business. In these situations, you must discuss issues such as the mental and physical demands of the job, shift rosters and working hours and ensure the host business has appropriate arrangements to prevent and manage fatigue.

Further guidance on consultation is available in the *Code of Practice: Work Health and Safety Consultation, Co-operation and Co-ordination.*

2. MANAGING RISKS ASSOCIATED WITH FATIGUE

2.1 Identifying the hazards

The first step in the risk management process is to identify all reasonably foreseeable hazards that could contribute to fatigue. Methods that may be used to collect this information include:

- observing work practices and systems of work
- talking to managers, supervisors, workers and their health and safety representatives about the impact of workloads and work schedules, including work-related travel and work completed outside of normal hours (for example, when people take work home)
- examining personnel records to determine working hours, particularly, if excessive hours have been worked or hours have been worked at unusual times
- reviewing records of past incidents and injuries that have occurred in the workplace, as well as any accidents workers have had travelling home or on work-related journeys, and
- obtaining information on fatigue from research, guidance materials and data published by regulators, industry associations, unions or other sources.

Safety critical tasks

Identifying fatigue hazards associated with safety critical tasks is particularly important. Safety critical tasks are those that require a high level of concentration, alertness and/or co-ordination and where the consequences of a mistake or error in judgement could cause serious injury, for example:

- driving a road vehicle or operating a crane or other high risk plant
- working at heights
- administration of drugs or participating in medical or surgical procedures
- other types of hazardous work, such as electrical work, and
- working with flammable or explosive substances.

Factors that can contribute to fatigue

There are a number of factors that can contribute to fatigue and should be taken into consideration as they may indicate areas where action should be taken to reduce risks. Many of these hazards can be interrelated and in some cases cumulative.

a) Mental and physical demands of work

Concentrating for extended periods of time, performing repetitious or monotonous work and performing work that requires continued physical effort can, by producing mental and/or physical tiredness, increase the risk of fatigue. Workers can be mentally and physically fatigued at the same time.

b) Work scheduling and planning

Scheduling work in a way that fails to allow workers enough time to physically recover and socialise can cause fatigue. The time of day (or night) work is performed and the number of hours worked in a working shift can impact on the risk of fatigue. Working at times when workers are biologically programmed to sleep and working for long periods of time can contribute to fatigue.

c) Environmental conditions

Working in harsh and/or uncomfortable conditions can contribute to fatigue, for example, working in extremely hot or cold climates or noisy workplaces can make workers tire quicker and impair performance.

d) Organisational factors

Organisational factors that can contribute to fatigue include:

- culture of an organisation to work extensive hours

- lack of flexibility at the workplace
- lack of clear work procedures
- incentives schemes, wages and conditions, and
- lack of information and training.

e) Individual and lifestyle factors

Factors that cause fatigue due to sleep deprivation include:

- lifestyle
- home environment
- health conditions
- other work commitments, for example, having a second job, and
- extended travel to home residences, for example, inter-state travel or travel overseas.

The checklist at *Appendix A* may assist in identifying fatigue hazards.

2.2 Assessing the risks

The second step in the risk management process is to assess the risk of injury from the fatigue factors identified. The risk assessment should reveal:

- where, which and how many workers (including contractors and subcontractors) are likely to be at risk of becoming fatigued
- how often is this likely to occur, and
- the potential severity of harm that would result.

In assessing the risks, the factors that contribute to fatigue should not be considered in isolation. For example, in the case of new workers, there may be an inter-relationship between the mental and physical demands of the job, hours of work and level of training. The risks of injury may increase where new workers work long daily hours in a physically demanding job.

Risk assessment methods can include:

- consulting with industry or employee association who may be able to assist with risk assessments for type of work and workplace
- check whether workers have had accidents (including transport) travelling home or on work-related journeys
- consult workers on workloads and schedules and ask if they are having or have experienced work-related fatigue
- comparing planned working hours with hours actually worked, and
- reviewing workplace incident data and asking the following questions:
    - What is the likelihood that fatigue is contributing to the incidents?
    - What time of day do incidents occur?
    - When incidents occurred, how long had the workers involved been working?
    - Do the incidents often happen when a worker's circadian rhythm is low and concentration is poor?

For example, the hazard identification step may have identified that shift work and overtime is a regular feature and potential hazard factor in the workplace. If eliminating shift work is not reasonably practicable, then the risk assessment should determine how the shifts operate and if the rosters could be reasonably modified to minimise the likelihood of sleep deprivation and fatigue. Overtime could also be limited in the shift roster.

The risk assessment should place the fatigue risk factors in order of priority – highest to lowest.

The risk assessment matrix at *Appendix B* provides further guidance on assessing the risks associated with fatigue.

2.3 Controlling the risks

The best way to control fatigue risks is to eliminate the factors that cause it at the source or if this is not reasonably practicable, minimise the risks.

When deciding on control measures to implement, check to see what is currently being used to address the problem and if they are effective. The controls that you choose will also depend on the person carrying out the work, the type of the business or undertaking and the characteristics of the organisation. For example, develop procedures for long daily work hours and related travel, where there may be increased risk of injury.

There are a number of controls measures that can be implemented to prevent fatigue. These are:

a) Mental and physical demands of work

- Use plant, machinery and equipment (for example, ergonomic furniture, lifting equipment and anti-fatigue matting for repetitive tasks performed while standing).
- Redesign the job to limit periods of excessive mental or physical demands.
- Introduce job rotation to limit a build-up of mental and physical fatigue.
- Reduce the time workers need to spend performing physical and mental demanding work by using rest periods (in addition to scheduled meal breaks) or implementing shorter shifts.
- Develop contingency plans for potential situations that could arise where workers will have to unexpectedly work longer hours, more shifts or a long sequence of shifts, for example, in emergencies.

b) Work scheduling and planning

- Schedule safety critical work outside low body clock periods (for instance, not between 2am and 6am or 2pm and 4pm).
- Manage workload and work-pace change caused by machinery breakdowns or planned and unplanned absences.
- Avoid working arrangements that provide incentives to work excessive hours.
- Include rest periods in the work schedule and accommodate for napping and sleeping if necessary.
- Ensure there are enough workers and other resources to do the job without placing excessive demands on them.
- Ensure work demands increase towards the middle of the shift and decrease towards the end.

<u>Working time</u>

- Eliminate or reduce the need to work extended hours or overtime.
- Develop a working-hours policy on daily work hours, maximum average weekly hours, total hours over a three-month period and work-related travel.
- Develop procedures for long daily work hours and related travel, where there may be increased risk of injury – for example, requiring minimum breaks on a regular basis, especially when total hours exceed maximum limits.
- Design working hours to allow for good quality sleep and enough recovery time between work days or shifts for travelling, eating, washing and sleeping.
- Eliminate or minimise the need to work long shifts for more than three consecutive days.
- Schedule work for hours when the risks may be lower – for example, complex and safety-critical tasks are best undertaken during normal day shifts when workers are less likely to be fatigued.

<u>Breaks during working time</u>

- Ensure that workers have adequate and regular breaks so they can rest, eat and rehydrate.
- Providing flexibility and encouraging workers to take breaks as required.

Rostering

- Use a forward rotation system - this means the direction of the roster is day to evening to night whereas a backward rotation shift is from day to night to evening
- Design rosters so there is adequate recovery time between shifts to travel, eat, wash and sleep.
- Avoid morning shifts with early starts before 6am.
- Shorten shift length and change the direction of shifts to a forward rotation system.
- Consider the timing split shifts, for instance, whether there could be sleep disruption because of the times workers are required to work.
- Consider avoiding split shifts that involve, for example, early morning work and late night work as they can affect the amount of night sleep.
- Offer alternatives to workers who may have difficulties adjusting to working hours.
- Ensure rosters reflect an appropriate mix of workers with different skills.

Shift work

- Set shift rosters ahead of time and avoid sudden changes to allow workers to plan leisure time.
- Avoid quick shift changeovers, such as finishing at 11pm and starting again at 7am.
- Control overtime, shift swapping and on-call duties.
- Allocate shift workers consecutive days off, including some weekends.
- Try to fit shift times in with the availability of public transport.
- Provide alternative transport at end of overtime/long shift.
- Limit shifts to 12 hours including overtime.
- Allow time for communication at shift handovers.
- Maximise breaks between shifts and before rotating staff to a new shift.
- Minimise the number of consecutive night shifts.
- Avoid overtime allocation after afternoon or night shifts (particularly after 10 or 12 hour night shifts).
- Provide information to shift workers that contains tips for them to prevent and manage fatigue. An example of a factsheet is included at *Appendix C.*

Night work

- Consider if night work is necessary and rearrange schedules so non-essential work is not carried out at night.
- Keep sequential night shifts to a minimum (no more than four nights in a row).
- Allow a 48-hour rest period between each set of shifts for night-shift workers.
- Allow regular night workers periods of normal night's sleep to catch up on their sleep debts.
- Ensure that rosters allow for at least two full nights' sleep after the last night shift.
- Arrange shifts so that day sleep is not restricted.
- Except for emergencies, give at least 24 hours notice before night work. Consider providing a longer period of notice so that workers have time to adjust their activities.
- Minimise night work for workers returning from leave to allow them to adapt.

On-call and call back work

- Design shifts and rosters to allow for good quality sleep and enough recovery time. Consider the opportunities for sleep and recovery in instances where workers are required to work on call after a normal shift or on days off.
- Set a policy in consultation with workers on on-call work.

Seasonal work

- Develop procedures for long daily work hours and work-related travel, for example requiring adequate breaks and additional breaks if total hours exceed a set limit.
- Provide on-site accommodation, meals and other facilities so workers do not have to drive after extended hours of work.
- Consider calling on additional staff.

Fly-in, fly-out work (FIFO)

FIFO is a method of employing people in remote areas. Rather than relocating the worker and their family to a town near the work site, the worker is flown to the work site where they work for a number of days and are then flown back to their home town for a number of days of rest. Usually a FIFO job involves working a long shift (for example, 12 hours each day) for a number of continuous days with all days off spent at home rather than at the work site.

In these type of work arrangements, the following should be considered:

- Developing a working hours policy that provides information about:
    - the number of hours that can be worked over a three-month period
    - the number of sequential night shifts that a person can work
    - the period of non-work following a sequence of night shifts (24 hours at a minimum), and
    - the return from rest and recreation to operations, allowing for adequate sleep before the first shift.
- Developing a policy and supporting procedures to deal with unexpected delays, for example, providing hotel accommodation, meals and taxis when there are delays in flights.

If organisations use fatigue management software to management their FIFO work arrangements, they may wish to consult experts on roster scheduling to minimise any working arrangements that may cause a worker to become fatigued.

Leave management

- Put in place processes to manage accrued leave balances and requests for leave.
- Consider future rosters and schedules when approving request for leave or shift swaps.
- Consider setting maximum amounts of leave accrual and optimal amounts of leave that can be taken at one time (for example, a minimum of 2 weeks leave at one time).
- Fill vacant positions as soon as reasonably practicable.
- Ensure the impact of service delivery needs on workers is considered.
- Ensure rosters reflect approved leave.
- Ensure sufficient workers are made available to fill a roster.
- Maintain a relief pool in high demand areas.
- Have access to on-call workers for unplanned leave, emergencies or where workload increases.
- Monitor actual time worked against the allocated roster and identify excessive hours are being worked. Review rosters and organise relief workers if extended breaks are required.

Absenteeism

- Put in place processes to manage absenteeism, accrued leave balances and requests for leave.
- Develop plans to deal with workload changes due to absenteeism.

Emergencies and unexpected events

- Planning for emergencies and unexpected events (for example, staff shortages, plant breakdowns and situations where staff are called back to work) should address control measures to prevent fatigue

c) Environmental conditions

- Avoid working during periods of extreme temperature.
- Install heating devices in cold work environments.
- Install cooling devices and/or provide access to cooled areas in hot work environments.
- Provide shelter in hot work environments.
- Install ventilation and mechanical cooling devices in hot, confined spaces such as truck cabins.
- Provide adequate facilities for rest, sleep, meal breaks, onsite accommodation (if appropriate) and other essential requirements.
- Install adjustable, vibration-free seats in appropriate machinery and vehicles.
- Ensure the workplace and surroundings are well lit, safe and secure.

d) Organisational factors

- Implement effective human resources policy and procedures, for example, procedures on rostering policy and overtime.
- Encourage workers to report any concerns they may have about work-related fatigue.
- Ensure managers and supervisors are trained to monitor fatigue levels in their team in order to prevent and manage fatigue.
- Consider measures to deal with risks where workers drive home tired or fatigued after long working hours, night work or a sequence of FIFO shifts.
- Consider alternative options to face-to-face meetings such as teleconferencing.
- Require field staff working long hours on a project to sleep overnight to avoid driving when tired or fatigued after project completion, for example, scientists or geologists carrying our research drive long distances to get home after their last day of work in a remote area.
- Provide assistance for workers when it becomes apparent that long working hours will arise in order to meet the project completion date.
- Review the need for subcontractors or labour hire staff to work similar shifts and shift cycles to the permanent workforce.
- Develop procedures for dealing with fatigued workers.
- Allow trial periods for new working arrangements and evaluating them.

e) Individual and lifestyle factors

Work and lifestyle often impact each other. For example, if a worker leaves their job tired and exhausted they may be less able to enjoy out of work activities or could be a danger to themselves and others in the community. Likewise, if a worker arrives at work unfit for duty due to a lack of sleep, illness or other condition, they may be less productive or could be a danger to themselves and others in the workplace.

To avoid any potential conflicts between personal and work demands, controls include:

- consult with workers and design shift rosters that will enable workers to meet both work and personal commitments, and
- develop a fitness for work policy and implement health and fitness programs.

Workers, managers and supervisors should be provided with training and information on how to manage fatigue at work, as well as beneficial practices to minimise the risks, such as gaining sufficient sleep.

2.4 Other hazards

It is also important to look at how the length of time a person is subjected to other workplace hazards, such hazardous manual tasks, exposure to hazardous chemicals, extreme temperatures and noise.

Hazardous manual tasks

A person conducting a business or undertaking must manage the risk of a musculoskeletal disorder associated with hazardous manual tasks.

The risk of a musculoskeletal injury increases during an extended shift due to the cumulative effects of muscle fatigue, strains and sprains. Workers should rotate to less physically demanding jobs towards the end of their shift.

The *Code of Practice: Hazardous Manual Tasks* includes guidance on specific control measures.

Exposure levels

Exposure to hazards including noise, heat and chemicals, may also increase during extended working hours. Under the WHS Regulations, exposure standards for noise and airborne contaminants must not be exceeded. National and international exposure standards are usually based on five eight-hour days per week.

Exposure should be carefully monitored and exposure levels adjusted. Seek expert advice when adjusting exposure levels. Exposure during a 10-hour work day, for example, may not equate to 1.25 times the exposure experienced during an 8-hour shift. The reduced recovery time after being exposed to a hazard during an extended shift also needs to be accounted for.

For potential *noise hazards* implement control measures to ensure that the exposure standard of 85dB(A) averaged over 8 hours is not exceeded. Guidance on noise control is available in the *Code of Practice: Managing Noise and Preventing Hearing Loss.*

For potential exposure to *hazardous chemicals and airborne contaminants* including dusts:

- carry out air monitoring to assess exposure to airborne contaminants
- refer to *Workplace Exposure Standards for Airborne Contaminants* published by Safe Work Australia and the Hazardous Substance Information System (HSIS) on the Safe Work Australia website (www.safeworkaustralia.gov.au)
- install adequate ventilation, and
- where appropriate, suppress atmospheric contaminants with, for example, dust suppression and/or removal of workers from the hazardous area.

Guidance on controlling the risks of hazardous chemicals is available in the *[draft] Code of Practice: Managing Risks of Hazardous Chemicals*.

For potential exposure to *extreme temperatures*, control measures may include:

- scheduling work for times when temperatures are moderate
- ensure exposure time is minimised – this could include rotating workers' tasks where reasonably practicable
- provide a cool area where workers can take a rest break and rehydrate, and
- provide adequate personal protective clothing and equipment and, where applicable, sunscreen.

For potential exposure to *vibration hazards*:

- where reasonably practicable, redesign the job or substitute equipment to eliminate or reduce the risk of whole body and/or hand vibration
- ensure exposure time is minimised – this could include rotating workers' tasks where reasonably practicable, and
- for hand vibration, requiring workers use anti-vibration protective gloves.

2.5 Information, instruction, training and supervision

The WHS Act requires that a person conducting business or undertaking must provide any information, training, instruction or supervision that is necessary to protect all persons from risk to their health and safety arising from work carried out as part of business or undertaking.

Training is an integral part of educating managers, workers and other persons at the workplace about the hazards and risks associated with fatigue. It gives them knowledge and skills to not only do their job but also implement appropriate control measures that can ultimately prevent fatigue from occurring.

Training should be arranged so it is available to all workers on all shifts. If workers must attend training outside normal shifts, it should be considered work time and rosters adjusted accordingly.

Information and training for workers should include:

- the work health and safety responsibilities of everyone in the workplace
- the body clock and how fatigue can affect it
- risk factors for fatigue
- symptoms of fatigue
- hazards and risks that may be associated with fatigue
- effective control measures for fatigue, for example, work scheduling, shift work schedules
- procedures for preventing fatigue, for example, incident reporting
- effects of medication, drugs and alcohol
- nutrition, fitness and health issues relating to fatigue, and
- balancing work and personal lifestyle demands.

Other relevant information including human resources policies or programs (for example, a Working from Home policy, Fitness for Work policy, Health and Fitness programs) and consultative mechanisms for raising work health and safety matters should also be provided to the worker at the beginning of their employment or contract.

Managers and supervisors

Managers and supervisors should be trained to:

- Recognise fatigue indicators
- Understand the various ways to prevent and manage fatigue and how they should be implemented, including how to design suitable rosters and work schedules.

Supervision

An appropriate level of supervision relevant to the assessed level of risk (for example a higher level of supervision for safety critical tasks) should be provided, which may include:

- monitoring work to ensure safe work practices are followed
- ensuring workers new to the job or unfamiliar with the work environment are adequately supervised
- where appropriate and practicable, ensuring workers do not work alone; and
- for those working alone, you must provide an effective means of communication. Further guidance on remote and isolated work is available in the *Code of Practice: Managing the Work Environment and Facilities*.

2.6 Monitor and reviewing control measures

Once controls have been implemented, you should be checking and reviewing them to ensure they are effective in preventing and managing fatigue.

In determining the frequency of the monitoring and review processes, consider the level of risk — high-risk hazards need more frequent assessments. Reviews of control measures should be carried out when:

- there is any indication risks are not being controlled
- new tasks, equipment, procedures, rosters or schedules are introduced
- any changes are proposed to the work environment, working hours, schedules and rosters
- there is an incident due to fatigue at the workplace
- new information regarding fatigue becomes available, and
- the results of consultation, including a request from a health and safety representative, indicate that a review is necessary.

Appendix D of this Code provides case-studies on using a risk management approach to address fatigue in the workplace.

APPENDIX A – FATIGUE HAZARD CHECKLIST

This checklist can be completed by a range of parties including persons conducting a business or undertaking, OHS managers, managers, supervisors, and health and safety representatives. If the answer is yes to any of the questions in the shaded areas, or yes to three or more of the questions in the non-shaded areas, you should assess fatigue risks and implement control measures.

Mental and physical work demands	
Does anyone undertake work for long periods that is physically demanding? (for example, tasks that are especially tiring and/or repetitive such as bricklaying, typing, process work, moving bags of cement, felling trees)	Yes/No
Does anyone undertake work for long periods that is mentally demanding? (for example, work that requires vigilance, work that requires continuous concentration and minimal stimulation, work performed under pressure, work to tight deadlines, emergency call outs, interacting/dealing with the public)	Yes/No
Work scheduling and planning	
Does anyone consistently work or travel between midnight and 6am?	Yes/No
Does the work scheduled prevent full time workers having at least one day off per week?	Yes/No
Does the schedule make it difficult for workers to consistently have at least two consecutive nights sleep per week?	Yes/No
Do work practices include on-call work, call-backs and/or sleepovers?	Yes/No
Does the schedule differ from the hours actually worked?	Yes/No
Does the work schedule include rotating shifts?	Yes/No
Does anyone have to travel more than one hour to get to their job?	Yes/No
Does anyone work in excess of 12 hours regularly? This would include any overtime worked.	Yes/No
Does anyone have less than 10 hours between each shift? (for example, split shifts, quick shift changeovers)	Yes/No
Is work performed at low body clock times (between 2 am and 6 am)?	Yes/No
Environmental conditions	
Is work carried out in harsh or uncomfortable conditions? (for example, hot, humid, cold temperatures)	Yes/No
Does anyone work with plant or machinery that vibrates?	Yes/No
Is anyone exposed to hazardous chemicals?	Yes/No
Is anyone consistently exposed to loud noise?	Yes/No

APPENDIX B – RISK ASSESSMENT CHART

Appendix 2 – Risk assessment chart

Photocopy for easy use.

The Risk assessment chart can be used to consider potential hazard factors and risks of fatigue. The chart highlights areas where implementation of risk control measures should be considered. A holistic approach should be taken in assessing risks and implementing control measures.

Risk assessment chart – to consider hazards and risks at your workplace/industry, follow the three steps:

Step 1. Hazard identification
Identify potential hazard factors at the workplace/industry, such as those listed in the column below. Consider hazard factors in the context of specific workplace/industry circumstances.

Step 2. Risk assessment
To assist risk assessment, a general level of risk for each hazard factor is indicated along arrow guides. In assessing risk, consider interaction between hazard factors that could influence level of risk, and as level of risk for each hazard factor is only indicative, take into account specific workplace/industry circumstances that may influence it.

Step 3. Risk control
Where a hazard factor is assessed as medium/higher risk, consider implementing control measures, such as those outlined in 'controlling fatigue risks' in this guide.

Hazard factors	General risk indicator for hazard factors Lower risk → Higher risk	Control measures
Mental and physical work demands		
Repetition (physical and/or mental)	Varying task demands → Highly repetitive work and/or high concentration work, with high demands over an extended period of time	Consider control measures – mental and physical demands of work
Physical	Minimal physically demanding work → Highly physically demanding work that results in muscle fatigue	
Mental	Minimal periods of high concentration and/or mentally demanding work → Long periods of high concentration and/or mentally demanding work	
Work scheduling and planning		
Hours		
Average weekly hours	35–40 hours (working week) → 48 hours (working week) → 56 hours (working week)	Consider control measures – working time
Total hours over a three-month period	→ 624 working hours	
Daily work hours	9 working hours → 12 working hours	
Daily work hours and work-related travel	→ 10 working hours → 13 working hours	
Scheduling of work	Regular and predictable hours → Irregular and unpredictable hours, short notice of schedule, extended overtime, on call across shift cycle	

Appendix 2 – Risk assessment chart continued

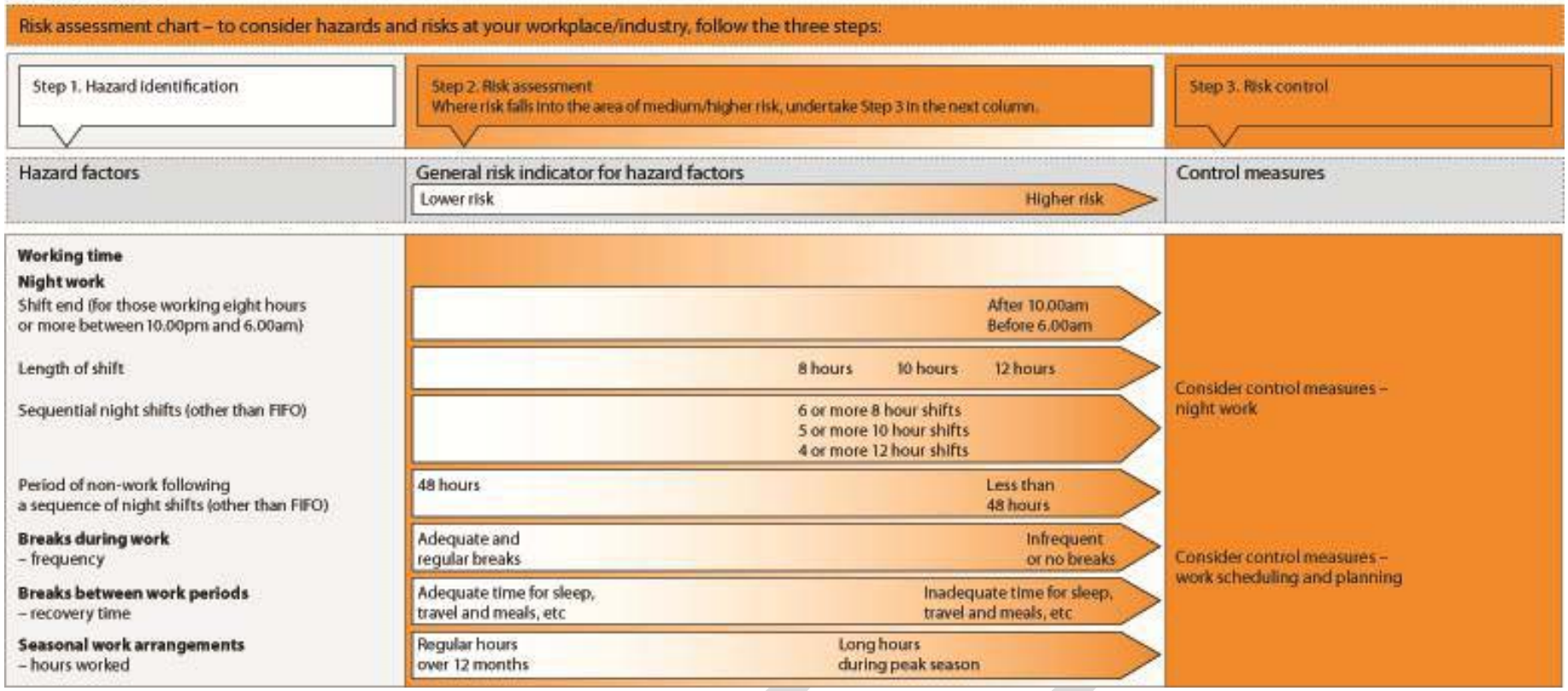
Photocopy for easy use.

Risk assessment chart – to consider hazards and risks at your workplace/industry, follow the three steps:

Step 1. Hazard identification	Step 2. Risk assessment Where risk falls into the area of medium/higher risk, undertake Step 3 in the next column.	Step 3. Risk control
Hazard factors	**General risk indicator for hazard factors** Lower risk → Higher risk	**Control measures**
Shiftwork Length of shift	10 hours – 13 hours	Consider control measures – shift work
Time of shift	Day shifts – Afternoon shifts – Night shifts	
Speed and direction of shift	Forward rotation (morning/afternoon/night) – Backward rotation (night/evening/morning) Slower rotation (e.g. weekly rotation/ 3-4 weekly rotation)	
Split shifts/variable shifts	13 hour period	
Working time Night work Shift end (for those working eight hours or more between 10.00pm and 6.00am)	After 10.00am Before 6.00am	Consider control measures – night work
Length of shift	8 hours – 10 hours – 12 hours	
Sequential night shifts	6 or more 8 hour shifts 5 or more 10 hour shifts 4 or more 12 hour shifts	
Period of non-work following a sequence of night shifts	48 hours – Less than 48 hours	
Breaks during work – frequency	Adequate and regular breaks – Infrequent or no breaks	Consider control measures – work scheduling and planning
Breaks between work periods – recovery time	Adequate time for sleep, travel and meals, etc – Inadequate time for sleep, travel and meals, etc	
Seasonal work arrangements – hours worked	Regular hours over 12 months – Long hours during peak season	

Appendix 2 – Risk assessment chart continued

Photocopy for easy use.



Appendix 2 – Risk assessment chart continued

Photocopy for easy use.

Risk assessment chart – to consider hazards and risks at your workplace/industry, follow the three steps:

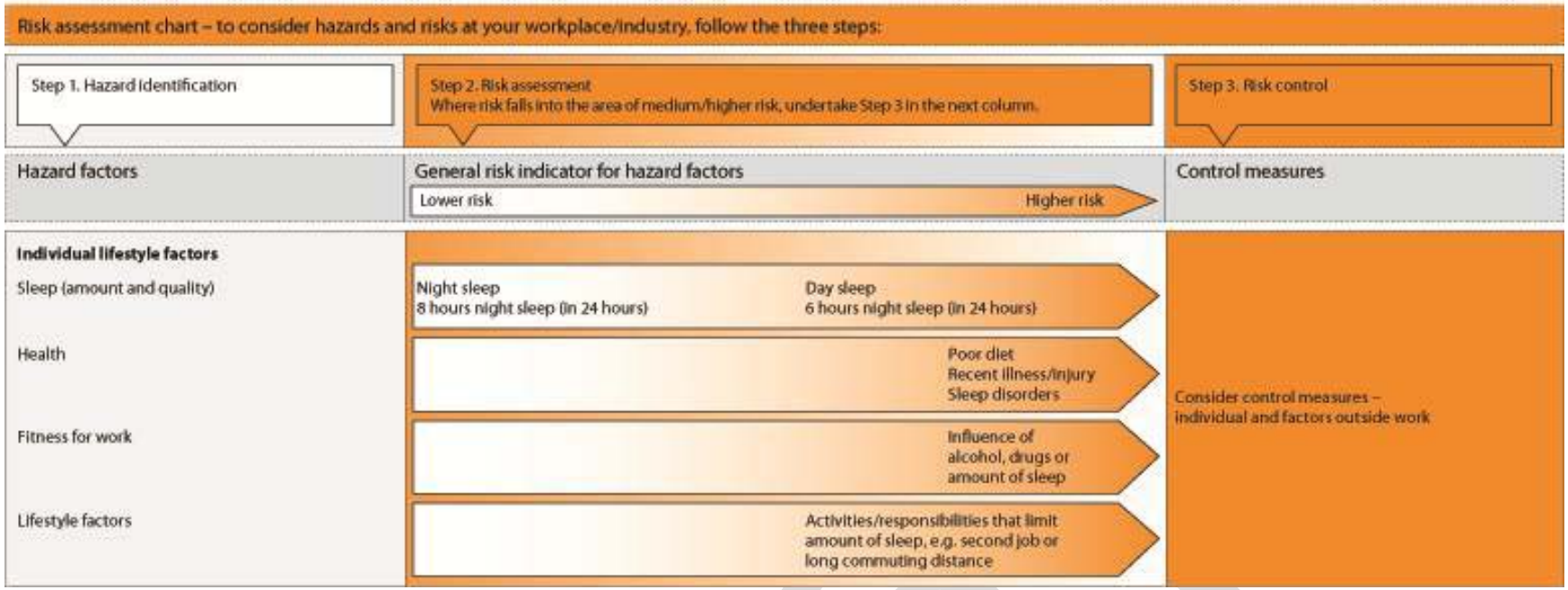
Step 1. Hazard identification	Step 2. Risk assessment Where risk falls into the area of medium/higher risk, undertake Step 3 in the next column.	Step 3. Risk control
Hazard factors	**General risk indicator for hazard factors** Lower risk → Higher risk	**Control measures**
Environmental conditions		
Exposure to hazardous substances and atmospheric contaminants	For hazardous substances, low risk calculated using national exposure standard[1] → For hazardous substances, high risk calculated using national exposure standard[1]	Consider control measures See section 2.4 of Code of Practice for Managing Noise and Preventing Hearing Loss at Work
Exposure to noise	– exposure for short duration – low noise levels[2] → – exposure for long duration – high noise levels[2]	
Exposure to extreme temperatures	Minimal exposure → Long period of exposure	
Exposure to vibration	Minimal exposure → Long period of exposure	
Training and information		
Lack of information on fatigue management and health and lifestyle factors	Adequate information is provided → No information is provided	Consider control measures – see training and information section 2.6 of Code of Practice for Managing Noise and Preventing Hearing Loss in the Workplace
Lack of training on fatigue management and health and lifestyle factors	Adequate training is provided → No training provided	
Lack of job skills training	Adequate training for job demands → Inadequate training for job demands	

1 To access exposure standards, see the internet database, Hazardous Substances Information System, available at www.safeworkaustralia.gov.au

2 Noise levels must not exceed exposure standards for noise under WHS Regulations.

Appendix 2 – Risk assessment chart continued

Photocopy for easy use.



APPENDIX C – INFORMATION FOR SHIFT WORKERS

FACT SHEET: SHIFT WORKERS AND FATIGUE

☑ **Managing odd hours**

To avoid a build-up of fatigue while you are night shift, you must get as close to your average amount of sleep as possible. The following hints may help:

- Curtains with back or blinds to reduce light levels when sleeping during the day.
- Sleeping in cool conditions helps in getting to and staying asleep.
- Reducing noise with heavy curtains and sound insulation on the doors and windows.
- Maintain a regular sleep schedule – a minimum of four hours sleep is desirable, but try to allow for at least seven hours in bed. Rest without sleep is still beneficial for the body.
- Try different sleep times in the daytime to find out which suits you best, for example, straight after work, before the next night shift or part of both.
- Try relaxing between work and bed. Some shift workers prefer to go straight to bed while others find it better to read or watch television first.
- Don't get upset if you can't sleep straight away. Read the paper or watch television.
- Don't drink too much liquid before going to bed.
- Avoid coffee in the last few hours prior to sleeping.
- Alcohol does not promote sleep – instead it lowers the quality of sleep overloads and stimulates the bladder.
- Be cautious with the use of sleeping tablets. They may help for a few days but should not be used in the long term.
- Heavy smokers have difficulties in going for long periods without a cigarette, especially during the day. Craving for a cigarette may wake you up. If you give up smoking you will sleep poorly until your body adjusts, but then your sleep will improve.

☑ **Managing life at home**

- Just as your body follows a rhythm, so does your social and family life. Once again, the shift worker is out of step. When you are awake everyone else is sleeping, when you are at work, everyone else has free time. School age children may only see their shift working parents for short periods. Try to:
  - Talk with your family ahead of time about problems that result from shiftwork and look for solutions.
  - Adjust to the household routine where possible. Give your partner or children the opportunity of making suggestions about how you can fit into their activities.
  - Take pre-school children to a playgroup on the mornings before you sleep, or arrange with friends with small children to swap child minding duties on sleeping days.
  - Take over some household duties on days off. One of the advantages of shift work is you will be home during the day.

☑ **Planning your social life**

- Normal social interactions with family and friends are so important people may cut down their sleep time so they can take part in customary social activities. This can affect work performance. When on shift work you should:
  - Plan to make the most of your time off. Let your friends know when you are free.
  - Use your free daytime when others are working for activities you like to do by yourself and do some of the jobs that might otherwise interfere with social occasions. See if there are others on shift work who will join you in daytime sport or other activity.

☑ **Managing your diet and physical fitness**

- The activity of the digestive system is reduced at night. Indigestion, heartburn and constipation may occur as a result of shift work. Extra food eaten at night may be stored as fat rather than used up to provide energy. You might:
  - Try having two meals at the regular times and a light meal in the middle of the

night shift.
    - Consider having the largest meal of the day after the day-sleep
    - Take a meal at or before 1am. The effects of a meal may be to decrease alertness in the second part of the night shift, so it's better to eat before become fatigued.
- Light meals, high in carbohydrate, based on rice, pasta, bread, are easy to digest. Avoid meals heavy in calories or with a high fat content because they take longer to digest and may make you feel drowsy.
- Snack on fresh fruit and milk products and avoid spicy and fried foods.
- Limit the amount of coffee towards the end of your shift, as coffee can keep you awake
- General physical fitness is important:
    - Make an effort to increase your physical activity during leisure time.
    - Join a gym or sports club so you can make use of their facilities on your days off.
    - If you are on regular medication (e.g. insulin for diabetes) or have a chronic recurring illness such as asthma, see your doctor for advice before beginning shift work.
    - Using commonsense rules for diet and physical fitness will help.

☑ **Other helpful hints**

- Before your first night shift, have a shorter sleep of between one to four hours to help reduce sleepiness at work.
- Where sleeping quarters are provided, consider sleeping in them before driving home after a night shift.
- When coming off night shifts into days off, have a short sleep on reaching home, and go to bed earlier that night. A good sleep is the quickest way of getting the circadian rhythm back to normal.
- Don't take on any extra work that could reduce the time available for sleep, especially, when you are on night shift.
- Social life, particularly on weekends, should be organised so you still get adequate sleep.

☑ **After your shift:**

- Fatigue and sleepiness on the job are the major problems but fatigue after the shift is over is also important. Remember to:
    - Be particularly careful when driving home after the night shift. Never drive if you've worked a double shift.
    - Keep your mind active by listening to the radio.
    - Even in winter, be wary of using the car heater as you may become drowsy in a warm car.

☑ **Who can help?**

- If you find you are having difficulty adjusting to shift work, your manager or supervisor, doctor, counsellor or an employee assistance service may help you find a solution.

APPENDIX D – CASE STUDIES

Case study one – Manufacturing

Situation	Risk Assessment	Outcome
A manufacturing company runs its operations 24 hours a day, with three shifts, morning, afternoon, and evening. All shifts are permanently allocated to three sets of workers. The night shift is undertaken by staff provided through a labour hire company. There is no limit placed on the number of consecutive nights contractors could work and there is less staff rostered to work at night than in the day. The night shift also has minimal maintenance staff working. The company did not think it had risk of fatigue until it undertook a health and safety review of workplace injuries, near misses and incidents. The review revealed that a number of injured workers were the night shift contractors. These injured workers had all worked more than 10 consecutive nights prior to their injuries.	The review of injuries, near misses and incidents revealed there were no effective fatigue risk controls in place during the night shift: • no limit was placed on the number of hours that could be worked • there was no monitoring of rosters actually worked • the continuous night shift roster provide insufficient recovery time to the people that worked it, and • consistent night shifts meant the night workers rarely got good quality sleep.	The review recommended the following risk control measures be implemented: • only operate the lower-risk production lines at night • give the night supervisors and night maintenance staff permission to shut down the production line when necessary • implement an organisation-wide fatigue management system to manage and monitor the number of weekly hours worked by each employee • place a limit of 10 consecutive days that can be worked in a fortnight • agreement with labour hire company to set limit on working hours of contractors, and • workers must have a minimum of six days off every month.

Case study two – Health

Situation	Risk Assessment	Outcome
After a medication administration error, a large city hospital conducted an investigation. During the investigation, they discover the nurse who made the error had worked more than 240 hours that month. She worked many long shifts, some were for 10 hours at night and some were for 12 hours in the day. The nurse had been required to work a number of night shifts at short notice to fill in for absent staff. Her unit manager had not been able to call on agency staff or casuals because of budget	The risk assessment revealed there were no effective risk controls for fatigue: • There was no monitoring of the rosters staff actually worked • Many shifts were scheduled in a backward rotation • Often the rosters didn't provide sufficient recovery time between shifts	The fatigue risk control measure the hospital implemented included: • A safe hours policy that included clear guidelines on how to develop schedules that reduced the risk of fatigue (including a maximum number of night shifts that could be worked in a roster cycle, minimum number of days off in a roster cycle and minimum hours break

constraints. For the entire month, the nurse did not get two days off in a row. The shifts she worked over the month were often on a backward rotation. Following the investigation, the hospital organised for a risks assessment to be conducted to ensure the situation would not happen again.	• Some rosters meant staff did not get two consecutive days off a week • Shifts were often varied at short notice.	between shifts). • A forward-rotating rostering system. • A roster-monitoring system that included checking rosters actually worked against the planned rosters every month. • budget allocation for agency staff to cover unplanned absences. • supervisor and staff training on the new rostering system.

Case study three – Emergency Services

Situation	Risk Assessment	Outcome
At the peak of the bushfire season, a four-person crew from one region where there are no fires is sent to assist another region fighting a fire front that is 50km wide. The area that needs the additional crew members is a four hour drive from the region's base. The crew are based at the fire ground for either five-day shifts or three-night shifts. The shifts are 12-hours long, including travel to and from a staging area at a community hall that is also used for meals and sleep. The community hall is used as a staging area for other emergency and support services and is therefore quite noisy and busy. A number of strike teams are in the same situation. The safety coordinator becomes concerned the strike teams are not getting the amount of quality rest and sleep time they need to avoid fatigue. The co-ordinator conducts a risk assessment with the health and safety representative to establish the main risk factors and put in place control measure that address the fatigue risk factors.	Key fatigue risk factors identified: • harsh environment caused by extreme heat, smoke and fire • travel time was not adequately accounted for in shift arrangements • the common rest area is noisy • fire fighting is very physically demanding work and requires a high level of vigilance to be maintained, and • insufficient recovery time provided.	The risk assessment leads to following fatigue risk control measures being implemented: • once the fire ground is contained, the number of teams working at night is reduced • shift lengths are shortened to 10 hours • supervisors on the fire ground monitor the teams for fatigue • teams alternate between active fighting and asset protection tasks • more suitable accommodation for sleeping is provided, where there is no motel accommodation a base camp is set up away from the main staging area, and • buses are provided for transport to and from fire ground and the meals and accommodation locations.