



**HEALTH & SAFETY GUIDELINES
FOR SHIFT WORK
& EXTENDED WORKING HOURS**

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1. INTRODUCTION

Work outside daytime hours is unavoidable in many industries such as essential services, work schedules which include shiftwork and extended hours, are unsuitable for some types of work. In addition, shiftwork and extended hours have often been introduced with little or no consideration of the risks to health and safety.

Employers owe a legal duty of care to employees which includes ensuring that health and safety effects are always considered in planning rosters and working arrangements. The effects of working hours on family and social life must also be considered.

As with other health and safety hazards, the greater the exposure to shift work and extended hours, the more likely the risk of some harm. Risk varies with the number of consecutive shifts worked, the length of shifts and the amount of night work. Long periods of extended shifts and long continuous hours of work can undermine the safety and health of those who work them, and the safety of other employees and members of the public.

Nevertheless, pressure to work shiftwork and particularly extended shifts is increasing. Perceived economic pressures in a highly competitive environment has led to a trend by employers to reduce staffing levels and then to increase shift work and extended hours in an effort to cut costs and increase 'productivity'.

The move to 24 hour, 7 day (continuous) operations across industries, is also increasing the pressure for work outside day time hours. This trend has been accompanied by pressure from employers to eliminate traditional penalty rates for night work, overtime and weekend work – in effect to treat all hours the same and pay for the work that is done, not when it is done.

From a health and safety perspective, all hours are not the same. Night work and extended hours which carry into the night period, are particularly difficult and hazardous. Overtime also increases the risk of fatigue, particularly when large amounts of overtime are worked. Fatigue can lead to accidents and near misses. Tired workers may not benefit fully from OHS and work-related training.

Some people work shift work and extended hours by choice, but for many it is a matter of economic necessity. In industries where remuneration is low but paid overtime is available, or where income is based on piecework, employees work long hours in order to earn an 'adequate' income. In all industries, job insecurity is a significant factor in the extent of excessive hours worked.

Employees' lives beyond work can be greatly influenced by rosters. The more shift work (particularly night work) and extended working hours people are exposed to per day, per week, and so on, the greater the effect on the quality of off-duty periods.

Rest days may increasingly be experienced as periods of recovery and recuperation from work. Social and domestic activities may still be possible, but fatigue, lack of motivation and a general sense of tiredness will be experienced.

Social and domestic activities are not luxuries. They are essential features of life in our society. The off-duty period must not become a "breather" in an endurance test of wall-to-wall work.

2. PURPOSE

These guidelines examine the health and safety hazards associated with shift work and extended working hours, and recommend measures for their assessment and control. They are intended for use by employees and by union and other employee representatives who have to deal with changes to working arrangements.

They do not aim to provide detailed scientific or medical evidence of the effects of shift work and extended working hours.

The underlying premise of the Guidelines is that all shift work and extended working hours involves some hazards, and as with other health and safety hazards, should be eliminated or reduced wherever possible.

The AMWU Impairment Policy 2009 is another useful resource for workplaces dealing with fatigue, drugs and alcohol, etc.

3. SCOPE

Some working arrangements are particularly affected by the nature or location of the industry. Examples include keeping watch at sea; flight crew schedules; long distance transport; emergency services; communications and broadcasting; and work in remote areas (eg. mining sites) or in locations which are difficult to access (eg. gas and oil platforms).

Specific arrangements may be needed - and may be in place - in these industries to minimise the hazards of shift work and extended working hours. However, the basic principles of the need for adequate and regular rest periods, both between and during worked shifts, and the particular hazards of extended and night shifts must be recognised and addressed in all industries.

4. LEGAL OBLIGATIONS

Under occupational health and safety legislation, the employer has a duty of care to provide a healthy and safe workplace and safe systems of work. This includes work organisation and working hours. Employers must identify the hazards and levels of risk associated with shift work, night work and extended working hours, and take action to control the risks. Employers have an obligation not only to employees but also to contractors and their employees.

Employers are required to:

- consult employees and elected representatives on health and safety at work
- provide adequate and appropriate information, training, instruction and supervision

- monitor working conditions to ensure hazards and risks to health and safety are eliminated or controlled
- provide adequate welfare facilities for all employees
- monitor the health of employees where required
- maintain information and records about working conditions, the health of employees, and OHS incidents or accidents at work

Employers are required to undertake a risk assessment with regard to all occupational health and safety hazards associated with their operations. This includes hours of work, especially shift work and extended working hours.

5. DEFINITION

It is difficult to arrive at an agreed definition of shift work and extended working hours. Shift work is usually described as work outside normal day hours.

Work within day hours means:

- A work day usually completed within a spread of hours starting at or after 7 am and finishing before 7 pm
- and*
- Working time consisting of no more than 8 hours per day and 40 hours or less per week (excluding overtime)
- and*
- Hours worked as a continuous on-duty period except for the normal meal and rest breaks

For the purposes of these guidelines, every system of work other than day work is regarded as shift work. This includes afternoon, night and rotating shifts, split or broken shifts, extended shifts, rostered overtime, and (unrostered) extended working hours.

6. WHO WORKS SHIFT WORK AND EXTENDED HOURS?

Major Industries Involving Shift Work and Extended Working Hours

- Essential services, such as electricity, water, power, sewerage, posts and telecommunications, police, customs, quarantine.
- Production industries with continuous processes (mining, oil refining, smelting, furnace, plastic).
- Manufacturing industries which are capital intensive or where demand exceeds capacity
- Health services, such as hospitals, ambulance, pharmacies, medical clinics and laboratories.
- Social and community care services
- Transport - bus, tram, train, shipping, coach and airlines.
- Food production and processing - farming, fishing, and manufacturing such as baking and cheese making.
- Hospitality – restaurants, hotels, clubs, casinos.
- The tourism industry, including airlines, resorts and hotels.
- Service industries, such as security and cleaning.
- Data processing centres: eg. finance, banks and insurance.
- The media (newspapers, broadcasting, television).
- Entertainment - artists, performers, producers, technicians and theatre staff.
- Retail - shops, supermarkets, etc.
- Education - particularly tertiary and further education
- Call centres, especially those with clients in a range of time zones

7. WHY ARE SHIFT WORK AND EXTENDED WORKING HOURS HAZARDOUS?

Most people will be affected by working shift work and/or extended hours. Irregular rosters, long hours and shift work, particularly night shifts, create and/or worsen a range of OHS hazards. While shift work and extended working hours are not identical in the ways they affect the health and safety of employees, their increasing interrelationship in working arrangements requires that they be considered together.

Shift work and extended hours can also affect the social and domestic lives of both employees and their families. Night shifts, afternoon shifts and weekend work cause the main problems, because they may be out of phase with the rest of the community, particularly family and friends.

The interaction between health and safety effects and the impacts on family and social life can have significant outcomes for the general health of those working shift work and extended hours.

Health and safety effects	Family and social effects
<ul style="list-style-type: none"> • changes in natural body rhythms • ongoing sleep problems • increased physical and mental fatigue • concentration difficulties • increased risk of accidents • increased exposure to hazardous substances, noise and manual handling risks • increased risk of heart disease • menstrual problems and difficulties during pregnancy • disturbed eating patterns and poor diet • gastrointestinal disorders and gastric and duodenal ulcers • more colds and other respiratory illnesses • stress • mood changes • irritability and/or anger • anxiety and depression • use of alcohol and other drugs to overcome effects of shift work 	<ul style="list-style-type: none"> • isolation from family activities • lack of contact with partners • reduced interest in sex • reduced contact with school-age children • higher rates of marriage breakup • reduced friendship networks • loss of access to education, sports, etc • exclusion from community, social and cultural events • irritability and anger in personal relationships

The Circadian Clock

Like other living organisms, humans have natural body rhythms which are regulated by a "circadian clock" in the brain. These are called circadian rhythms.

Over a 24-hour period the circadian clock regulates sleep/wake patterns, body temperature, hormone levels, digestion and many other functions. Depending on the time of day or night, the human body is programmed for periods of wakefulness and sleep, high and low body temperature, high and low digestive activity, and so on.

Adults tend naturally to sleep by midnight, wake near dawn, and stay awake through the day (with an afternoon sleepy period). This pattern is repeated every 24 hours.

Body temperature is at its lowest between 2am and 6am. The ability to concentrate and perform tasks is also at its lowest in these early hours of the morning, paralleling the fall in core body temperature.

Work/rest schedules caused by shift work disrupt the circadian clock, causing symptoms similar to jet lag. Generally no complete physiological (body function) adaptation takes place for the majority of night shift workers. A majority of night shift workers suffer ongoing sleep problems.

It is generally easier for the body to adapt to rotating three shift systems (day, afternoon and night) if the rotation is in the order of *day* then *afternoon* then *night*. This is a forward rotation (as in forward on the clock face). People usually find it easier to get up later as allowed in a forward rotation, rather than earlier and earlier as is required in a backward rotation.

Sleep difficulties

Sleep is not a process of simply "switching off" the brain. It is a complex process that involves stages of deep and light sleep that occur over a full sleep cycle, which takes about eight hours for most adults. The later stages of this cycle are crucial for physical recovery and psychological adjustment. An interrupted or shortened sleep can mean little effective rest.

Without enough sleep the human brain may spontaneously shift into sleep in order to meet its need. This might only last a few seconds, or might stretch to several minutes. These involuntary sleep episodes can occur while standing, operating machinery or driving.

Sleep during daylight hours following night shifts is difficult. Most shift night workers sleep an hour or two less in daylight than they normally would, and report that the quality of their sleep is worse. This is largely due to mismatched circadian rhythms and external cues (light, food, noise, temperature) around the worker while trying to rest.

Together with social factors, this explains why many shift workers suffer from chronic sleep problems. Continued poor quality sleep is a strong predictor of psychological and physical ill health.

Physical and psychological effects associated with sleep difficulties include fatigue, dizziness, inability to concentrate, perceptual changes, mood changes, gastric problems and disturbance of eating habits.

Some studies have suggested higher death rates amongst former shift workers and/or those who sleep less than 7 hours per day.

Sleep debt

Disruptions to normal sleep routines are often associated with night work, where the major difficulty is getting adequate undisturbed sleep during the day. Extended hours which carry into the night period may create a similar problem. The cumulative result of these disruptions is lack of sufficient sleep, which may lead to what is called sleep debt.

Unpredictable work schedules can also compromise the quality of rest time, particularly if there is a continual possibility of recall to duty.

One recent study suggests that extended periods (more than 16 hours) without sleep have similar effects on reaction times to having a blood alcohol content higher than 0.05%.

Fatigue

Fatigue is tiredness that results from physical or mental exertion. The extent of fatigue will vary depending on the workload imposed by a job, the length of shift, previous hours and days worked, and the time of day or night.

Jobs which require standing for lengthy periods, frequent manual handling or repetitive movements, or heavy work which is physically demanding can lead to increased fatigue on long shifts or shifts with overtime. Monotonous work or work where a high level of attention and alertness is required can also increase fatigue.

Rosters must be designed to minimise sleep debt and fatigue. Rest days should be distributed throughout the roster cycle to allow recovery and recuperation before fatigue becomes acute. An accumulation of rest days as a result of extended periods of shift work should be avoided. The "banking" of rest days cannot compensate for daily fatigue. This is particularly important when considering compressed working weeks.

Lack of sleep and fatigue in combination can adversely affect job performance, risking individual health and safety and the safety of others.

Night work

Each hour of night work imposes a greater workload than the same hour during a day shift (3am versus 3pm), because of the effects of circadian rhythms. Work which is physically or mentally demanding, monotonous, or requires high vigilance can lead to fatigue which will be worsened by night work.

Night work combined with extended hours is extremely hazardous in terms of sleep debt and fatigue, and may result in an increased risk of accidents at work.

Disrupted eating patterns

The timing of meals is important from both physiological and social perspectives. Shift work, particularly night work, can continually disrupt eating patterns.

Digestive function is governed by circadian rhythms, and is reduced at night. Eating large meals, or intake of coffee and other drinks containing caffeine to stay awake at night can result in a range of symptoms such as indigestion, abdominal pains and bowel disturbances.

Studies show that shift workers are more likely to display these symptoms than day workers. In the medium to long term more serious diseases of the gastrointestinal tract may develop.

Stress

Almost 14% of respondents to the 1997 ACTU national survey on stress at work named long hours and rostering among the three most stressful conditions in their workplace. This was highest in the construction, mining and transport areas. Almost 12% reported difficulties organising childcare.

Stress associated with shift work and extended hours may be caused by any, or a combination, of:

- poor roster design (including the predictability of hours)
- the physical and mental demands of the work
- the ability to balance childcare, family and other responsibilities
- the physiological and psychological effects of disrupted circadian rhythms.

Increased use of alcohol and other drugs

Use of drugs such as caffeine or amphetamines by workers trying to overcome the effects of fatigue, and/or alcohol or sleeping pills to try to get to sleep, is a hazard of shift work. Any benefits are short-term, while the long-term effects on health and safety can be dangerous. In particular, lack of sleep and fatigue can increase the effects of alcohol.

Substances such as amphetamines ("uppers" or "speed") are highly dangerous. As well as the risk of addiction, these drugs can cause high blood pressure, heart irregularities and mental confusion.

Exposure to other OHS hazards

Extended shifts, whether rostered or unrostered, may increase exposure to other OHS hazards such as chemicals, noise, uncomfortable temperatures and manual handling.

Exposure standards for hazardous substances are based on an eight hour day, forty hour week. Any increase or extension of daily/weekly hours requires a lowering of the average hourly level of exposure to the hazard. This is particularly important for sensitisers, carcinogens and chemicals producing chronic toxicity.

Chemicals take varying times to be eliminated from the body, and breaks between shifts must be long enough to allow this to occur before there is any further exposure. Rosters need to be designed to allow adequate recovery time, and expert advice on exposure levels should be sought.

Standards for exposure to noise are also based on length of exposure, so similar and expert advice will be required to avoid excessive exposure and to allow adequate recovery time.

Manual handling hazards may be increased by shift work, especially extended shifts, due to the cumulative effects of muscle fatigue, and the need for adequate recovery from muscle fatigue and from any sprains and strains.

Working in uncomfortable temperatures for lengthy periods is another OHS hazard, which may frequently be encountered on afternoon or night shifts, and which will be increased by extended shifts.

Medical problems

Many studies have indicated links between shift work and major medical problems. These include:

- a higher incidence of gastrointestinal disorders and gastric and duodenal ulcers
- a connection between long periods of shift work and heart disease
- more colds and other respiratory illnesses among shift workers than their day work counterparts
- a range of complaints associated with stress, caused by disruption of family and social life

Those already suffering from digestive disorders, diabetes, heart diseases, psychological problems, alcohol and drug addiction and chronic sleep disturbances face additional burdens.

Shift work rosters can also adversely affect health because they can make it harder for employees to follow specific requirements for medication or other health routines.

Effects on women

The effects of shift work (particularly night work) on pregnancy and menstruation are being increasingly documented.

A study of the effects of night work on nearly 800 women found that the incidence of irregular menstrual cycle was significantly higher in women working nights than in women working during the day. The results indicate that night work may suppress ovarian function by affecting hormone levels which are governed by the circadian rhythms.

While evidence of adverse effects of shift work on pregnancy is mixed, extended working hours can worsen the effects of other hazards during pregnancy. These include standing for long periods; working in heat and cold; lifting or other physically

demanding tasks; and exposure to chemical, biological and radiation hazards - all of which may affect the health and safety of the pregnant women, the development of the foetus, and may also have health implications for breast feeding.

Older employees

Coping with shift work and extended working hours may become more difficult for older employees, due to interaction between:

- changes in circadian rhythms
- reduced ability to cope with stressors
- increased sleep fragility – sleeping less, waking earlier
- cumulative effects of years of shift work

Cumulative effects

The hazards associated with shift work and extended working hours increase with the level of exposure. Even with well-designed rosters, long periods of shift work and extended hours will increase the health and safety risk. When shift work and extended hours are worked in excess of the length and timing recommended in these guidelines, the risk will be substantially increased. The more the recommendations are exceeded, and the longer the period over which this occurs, the greater the risk.

8. OVERCOMING THE HAZARDS OF SHIFTWORK AND EXTENDED WORKING HOURS

STEP ONE: A SAFE PROCEDURE

Consultation

Changing shift rosters can fundamentally affect working, social and domestic lives of employees. A process of ongoing consultation between employees and management is essential to minimise or control any harmful effects.

All new shift work rosters should be developed, monitored, evaluated and agreed by a joint working party. This working party must include representatives from all employees who will be affected, OHS and trade union representatives. Senior or middle management should also participate, so final decisions can be made within the working party.

Consultation should begin by identifying:

- why changes to the present system are wanted
- the benefits and problems of current shifts.

This can be done through a survey (*see the sample survey at the end of these guidelines*), and through interviews and group meetings which might use the issues identified in the survey as a basis for discussion.

Employees may have had little or no experience with alternative shift systems. It is important to outline ways of organising working hours, pointing out their benefits and disadvantages, before employees are asked to make decisions.

Different parts of an organisation may require different rosters. Rosters should be tailored for particular operational needs and the needs of employees, rather than forcing standardisation.

Information about the occupational health and safety effects of shift work should be provided and carefully explained.

As much time as possible should be allowed for employees, and their families, to understand how new rosters will work, and to discuss how proposed changes will affect them.

Issues of concern and stress for employees may include wages, changes in overtime levels, night work, days off, sick days, annual and other recreation leave. It is important that these issues be addressed and monitored from the beginning of the process, and that changes in rosters do not become an opportunity to diminish conditions of employment.

Expert advice

The OHS effects of shift work may not be immediately evident. Employees need the support and advice of their union in this matter, and an OHS professional with shift work expertise *and* experience may need to be involved in the process. Without such advice and information, inappropriate decisions could be made.

When a consultant is to be employed, it should only happen with the agreement of all parties. Employees should contact their union or trades and labour council for advice about the choice of consultant.

Information provision

All employees who undertake shift work should be provided with professional advice and training in:

- the health, safety and social effects of shift work
- personal coping strategies
- standard operating procedures that apply to specific shifts
- support services that are available to employees performing shift work
- guidelines for the design of shift work rosters
- security arrangements/procedures for shifts where there are reduced employee numbers

Provision of training and advice should include managers and supervisors, who should be fully educated about shift work-related OHS problems.

Monitoring and Evaluation

The introduction of shift work, or any change in shift work arrangements should be on a trial basis for twelve months, preferably with a preliminary review after six months. All work on the development of new rosters should be on the basis that trials contain a 'sunset clause' which may be activated by a vote of employees should they wish to return to previous rosters at the expiry of the trial period.

Before the trial a survey of the attitudes of employees to current working arrangements and proposed changes should be conducted. (*See the survey at the back of these guidelines.*)

As with all health and safety hazards, ongoing surveillance of the working environment should occur throughout the trial.

After the trial a detailed evaluation should be carried out. This could include repeating the original survey of staff for their feelings about the new shift system and problems and benefits, including benefits and/or problems and effects on health, wellbeing and their social and family life.

It should also analyse the results of the surveillance of the working environment, with a view to identifying and implementing measures to improve that environment and the health and safety of workers.

This analysis should consider organisational criteria such as accident/injury rates, near misses, levels of overtime, absenteeism, staff turnover, reasons for resignation of workers leaving after introduction of the new system, error rates, productivity measures, journey accidents and other changes in work organisation.

Health assessments of employees

Health assessments of employees may be useful for the evaluation of the effects of the introduction of shift work, or of changes to shift systems. Health assessments may take

the form of individual medical examinations, or assessments of the aggregate work force.

Health assessments should be carried out with the participation and fully informed agreement of the employees and/or their representatives, with the central purpose of prevention of work-related injuries and disease.

Health assessments of employees should take into account:

- the nature of hazards and risks in the workplace
- the requirements of the work
- relevant laws and regulations
- the fact that health assessments of employees are not a substitute for assessment and control of the work environment

Any medical examinations which may form part of health assessments should be at the employers' expense. The choice of physician should rest with the employee. Physicians carrying out medical examinations on shift workers should be provided with a duty statement for that employee and a list of hazards to which they are exposed.

The results of individual medical examinations should be confidential to the employee and should be accompanied by a clear explanation of what they mean in practice. A certificate of fitness for shift work (or otherwise) may be provided to the employer by the medical practitioner.

Where health assessments have been conducted, aggregate data should be provided to all workplace parties affected by shift rosters. This data must always preserve the confidentiality of individual employees.

Where health reasons make it impossible for an employee to continue shift work, the employer shall take all necessary steps to find suitable alternative duties for the employee. Retraining should be provided where necessary, and loss of earnings should be minimised.

STEP TWO – IDENTIFYING THE HAZARDS

Work related injury and disease arise from the hazards at work. These can include the design of work processes, the use of materials, substances, machinery and equipment - and the hazards which may be emitted from them (noise, fumes, radiation, etc), and the organisation of work.

Working hours should be treated in the same way as other health and safety hazards. The recognised process for addressing OHS hazards is called the hierarchy of controls:

1. identify the hazards
2. assess the risks posed by the hazards
3. eliminate or control the hazards

Techniques that can be used to identify hazards include:

- Investigating employee complaints
- Examining accident and sickness records
- Conducting employee surveys
- Environmental and medical monitoring

- Assessing expert reports
- Reviewing scientific and medical literature
- Incident, injury and illness investigation

STEP THREE – FACTORS TO CONSIDER IN ASSESSING THE RISKS

Factors to consider in assessing the risks posed by the hazards include:

- type of work and workload of employees
- personal needs and work experience of employees
- special circumstances on the site

Workload

All jobs, and all tasks within jobs, impose a workload. The following need to be considered in risk assessment::

- the physical effort required eg lifting, carrying, driving, operating a machine, using a keyboard
- the demands of the work environment eg noise, heat, dust, chemicals
- the mental demands caused by monotonous, repetitive activities or the need for high vigilance and concentration
- the pressure on the employee eg bonus and incentive schemes, piece-rate systems, performance monitoring, number of different tasks
- the hours of work including night shift versus day shift, length of shifts, timing of shifts, and breaks between shifts
- the body's physiological and psychological responses to workload, eg. heart rate, hormone production, blood pressure, stress, anxiety and fatigue

Physically or mentally demanding work will increase the risks associated with shift work and extended hours. In such circumstances, risk assessment may indicate that shift work or extended hours should not be worked.

Needs of Employees

Arrangements for shift work and extended hours also must consider the needs, commitments and responsibilities of all employees, which may include:

- parents who rely on child care services
- caregivers who rely on relief to be able to work
- pregnant women
- older employees
- those with existing physical/medical problems
- people who rely on public transport to get to and from work
- part-time students who may have difficulty arranging working time and classes

Risk assessment must consider the stress imposed by shift work and extended hours on employees who are trying to balance work and other commitments, and its likely impact on their health and safety.

STEP FOUR – MEASURES TO CONTROL THE RISKS

Hierarchy of controls

Shiftwork and extended working hours should be controlled in the same way as other hazards at work. In addition to ensuring a safe procedure (outlined above as step one), the most effective method is based on the hierarchy of controls.

Where possible, the hazard should be eliminated - other ways of organising work should be found that eliminate or reduce the need for shift work and extended working hours.

Where shift work and extended working hours are necessary, the risks can be reduced by adopting the following control measures.

Length of shifts and working hours

It is recommended that the maximum hours to be worked in a day or a week (7 days) should not exceed the following, other than in emergency circumstances:

- maximum of 6 consecutive 8-hour shifts
- maximum of 2 consecutive night shifts
- maximum of 2 consecutive 12-hour shifts
- maximum 12 hours overtime per week
- maximum 12 hours work per day (including overtime) except in emergency circumstances
- maximum 48 hours rostered work per week

In emergency circumstances a maximum 60 hours work in one week may be necessary. It should not be worked on a regular basis, or in consecutive weeks.

Split or broken shifts

Split or broken shifts should be avoided wherever possible. As they are usually arranged to cover periods of peak activity, they put employees at risk of work overload. They can result in inadequate rest, and make participation in family and social life difficult.

Overtime

Overtime should not extend the length of shifts beyond the maximum lengths recommended above. A supervisor should be responsible for monitoring the overall work pattern when overtime shifts are introduced. Records should be kept of the hours individual employees have worked.

Where overtime is worked, it should be limited to a maximum of 12 hours per week.

Overtime after 12 hour shifts is a high-risk practice and should never be worked other than in emergencies.

Employers need to establish systems which provide for relief staff to cover emergencies, or possible absences on incoming crews. Accidents, plant failures and process breakdowns are no reason to risk the health and safety of employees. If overtime must be worked whilst waiting for relief in an emergency, it should be limited to a maximum of two hours.

Night Work

Night work should be avoided wherever possible. Each hour of night work should be regarded as imposing a greater workload than the same hour (3am versus 3pm) during a day shift, so workload demands at both enterprise and individual levels should be lower at night.

The number of consecutive night shifts should be minimised to no more than two in a row. The maximum length for night shifts should not exceed eight hours.

The volume of work should be organised to ensure that the number of employees needed to work at night is kept to a minimum. Staffing levels must be kept high enough to ensure employees are not overloaded with work, are not at risk from increased exposure to other hazards, and are not working in isolation.

Work which is physically or mentally demanding, monotonous, or requires high vigilance can lead to fatigue which will be worsened by night work. Bonus or incentive schemes or other pressures to achieve productivity are not suitable for night work.

Night work should be organised to allow and encourage employees to take rest breaks and pauses, away from work stations. All breaks and pauses should be increased in number and duration compared to day shifts.

Short naps may be helpful during night shifts, particularly on extended shifts. Where practicable, facilities for sleep breaks during night shifts should be provided.

Extended and 12 hour shifts

Shift work involving twelve hour rosters may introduce new hazards into the workplace as well as exacerbating existing problems faced by shift workers.

Twelve hour shift work, with correctly designed rosters, may seem to provide benefits to workers by increasing leisure time and relieving the pressure of seven day shift systems. In order to minimise the hazards of 12 hour shifts, it is essential that the increased leisure time be used for recuperation and recreation and not as an opportunity for additional employment.

Whilst day work does not involve the same disturbances to circadian rhythms as night work, twelve hour day work may increase the risk of health effects which are generally associated with shift work. Exposure to work hazards such as noise, heat and chemicals may be increased by 50% and must be carefully monitored.

Extended or twelve hour shifts should not be worked where there is unavoidable continuous exposure to noise, hazardous substances and/or temperature extremes in excess of legislated or recommended exposure standards.

Bonus/incentive schemes or other pressures to achieve higher productivity (eg piecework) should not be incorporated into extended or 12 hour shifts.

Breaks during shifts

Adequate and regular rest breaks and pauses are essential health and safety requirements. Meal breaks or rest breaks should not be traded off for an early finish time.

The number and duration of breaks during a shift should be adapted to the type of work, workload and length of shift. Longer and more regular rest breaks and pauses are needed the longer the shift.

It is recommended that breaks during shifts should at least include:

- on 8 hour shifts, one meal break of at least 30 minutes, and two shorter breaks totalling at least 30 minutes
- on 10 hour shifts, two meal breaks of at least 30 minutes each, plus two other short breaks totalling 20 minutes
- on 12 hour shifts, one meal break of 45 minutes and another of at least 30 minutes, plus two or more shorter breaks totalling a minimum of 30 minutes

The number and length of breaks during a shift is based on the physiological need for food and fluids at regular intervals. Most people would eat at least 2 meals during a 10-12 hour period of wakefulness.

The maximum amount of time an employee should work without a break is 2.5 hours.

All breaks should be taken away from the work station. Breaks at the work station are of poorer quality and do not provide adequate rest.

Breaks between shifts

Breaks between shifts should not be less than 12 hours. On rosters with extended shifts, this minimum break (12 hours) should be alternated with a break of at least 24 hours.

In emergencies where a worker needs to remain on-duty after a shift, the minimum break between shifts should never be less than 10 hours and should be compensated as soon as possible with a longer break.

Rest days

Days off between blocks of shifts should be evenly distributed. Compressing working weeks to produce longer breaks may sound appealing, but is an OHS hazard. Accumulation or "banking" of rest days cannot compensate for daily fatigue.

Good roster design should result in at least one full and two half weekends off in every four. Shift systems which allow at least two whole weekends off per month are preferable.

Work should be organised to ensure that the number of employees rostered to work on weekends is kept to the minimum possible. However, those working must not be overloaded with work.

Timing of shifts

For the best OHS outcomes, it is recommended that shifts do not start between midnight and 6 am. This is to ensure an opportunity for adequate night rest.

Rotating shifts

If a rotating three shift system is in operation (day, afternoon and night) the rotation should be in the order of *day* then *afternoon* then *night*. This is a forward rotation (as in forward on the clock face).

If shift start times vary throughout a sequence of shifts, they should commence with an early start and move progressively later. Changes from a late start to an early start reduce the number of rest hours between shifts.

Roster pattern and length of cycle

Rosters should be regular and predictable, to avoid disruptions to rest and sleep periods, and for better organisation of private, family and social life.

It is generally preferable that the roster cycle be as short as possible, while remaining consistent with the recommendations above under "length of shift". Roster details should be available to employees well in advance, and maximum notice should be given regarding changes in the roster.

Standby and on-call duties

Being on standby or on-call means that the employee has not entirely stopped work. Anxieties and stresses related to the job are still experienced. Such periods should be included in workload calculations.

If people on-call are called in to work, this can lead to accumulated fatigue, lack of sleep and severely disturbed sleep.

For OHS reasons, an adequate rest period should be provided after any on-call period and employees should not be rostered on-call during minimum breaks between worked shifts.

Standby and on-call periods should make allowance for any employees with special needs.

Exchange of shifts

Exchange of shifts for special reasons should be allowed, provided the change does not result in excessive daily or weekly hours for any employee. A supervisor should be responsible for monitoring the effect on individual roster patterns.

Exchange of shifts should not occur if it results in 2 or more continuous shifts being worked (ie. no break between), or if recommended maximum hours are exceeded.

Exposure to other OHS hazards

Special rosters are required for workers exposed to hazards, where health and safety standards are determined on the basis of exposure over eight hours.

Rosters should be designed to allow adequate recovery time. Chemicals take varying times to be eliminated from the body, and breaks between shifts must be long enough to allow this to occur before there is further exposure. Expert advice on exposure levels should be sought.

Standards for exposure to noise are also based on length of exposure, so similar and expert advice will be required to avoid excessive exposure and to allow adequate recovery time.

Manual handling hazards may also be increased by extended shifts, due to the cumulative effects of muscle fatigue, sprains and strains.

Isolated work

Isolated work can be dangerous because of the lack of others present to assist and/or raise the alarm should anything go wrong. Work should be organised to avoid working in isolation wherever possible, and as the risks can be greater at night, employees should not work alone at night.

In cases where employees must work in isolated situations, they should be visited or communicated with on a twenty-minute cycle, with such contacts formally recorded. An alarm or communication system should be available at all times. Employees must not use machinery when alone.

Hand-Over

Appropriate mechanisms should be in place to enable efficient and safe hand-over between shifts, and ensure new shifts are adequately informed about all issues that have arisen in the workplace.

Travel

Where possible, shifts should be arranged to start and finish at times when public transport is available.

Driving home from work can impose increased OHS risks, particularly on night shifts and extended shifts. This risk increases with the number of consecutive shifts worked.

Where night and extended shifts are worked, employers should provide transport to eliminate the risk of fatigue-related journey accidents.

Safety and security

Movement throughout the workplace and surroundings should be safe and secure and all areas should be well lit. For afternoon shifts and particularly night shifts, secure, well-lit car parks should be provided. If necessary, they should be patrolled by security personnel.

Security arrangements should be made for employees who use public transport.

Communication

Shift workers should be kept informed about important matters concerning the workplace. Paid-time meetings should be organised during their shift. If workers are required to attend any meeting outside their shift, likely effects on sleep, etc. must be considered, and rosters should be adjusted accordingly.

Representation

Shift workers should be adequately represented on any committees with a consultative or decision-making function regarding their work. All shifts should have H&S representatives and direct representation on OHS committees. It is usually difficult for employees to attend meetings outside their shift. Anyone who must attend such meetings should be considered to be *at work* and rosters should be adjusted accordingly.

Information & Training

Special arrangements should be made to allow shift workers access to training, occupational education and information. Training should be organised so it is available to employees on all shifts. If shift workers must attend training outside their shift, they should be considered to be *at work* and rosters should be adjusted accordingly.

First aid

First aid facilities must be available to shift and night workers, including arrangements for transportation for appropriate treatment. A trained first aid person should be available on all shifts. Trials of emergency procedures should be conducted for all shifts.

Heating and cooling

Adequate heating or cooling should be provided to ensure an acceptable level of thermal comfort for all shifts. See *ACTU Guidelines for Working in Seasonal Heat* for recommended temperature ranges.

Facilities

Rest areas and meal facilities adapted to shift schedules should be provided for all shifts. Canteens offering nutritional meals should be available, plus facilities for those who want to prepare or reheat their own food.

Child Care

Child care which is adapted to the needs of the employees at each particular workplace should be provided by the employer at, or close to, the place of work.

Home modification

Employers should provide assistance with home modifications to minimise noise, light and heat so shift workers can get adequate day sleep.

Modifications may include:

- air conditioning
- heavy curtains and/or blinds
- an answering machine
- noise insulation, including carpet, acoustic tiles, double glazing or heavy curtains

9. FURTHER READING

Berger, Yossi, "Shiftwork: Maladaptation and Deprivation – A Window into Some Workplaces", Paper presented at the *Shiftwork and Irregular Hours of Work: Current Developments* Seminar, Sydney 1994.

Berger, Yossi, "Shiftwork", *Say Safety: The AWU National OHS Magazine*, December 1997.

Costa, Giovanni, "The impact of shift and night work on health", *Applied Ergonomics*, Vol. 27, No. 1, 1996.

Dawson, Drew et al, *Evaluation of a field-Based Approach to Assessing the Risk Associated with Shiftwork: Final Draft Report to Worksafe*, The Centre for Sleep Research, Adelaide, 1998.'

Heiler, Kathryn. *Is Enterprise Bargaining Good for Your Health?* Paper presented at the Worksafe forum, *Shift Working*. Sydney, 1995

Heiler, Kathryn, *The 12 Hour Workday: Emerging Issues*, ACIRRT, University of Sydney, 1997

The Journal of Occupational Health and Safety Australia and New Zealand, Volume 13, No.5. Special issue on managing shiftwork

National Code of Practice – Hours of Work, Shiftwork and Rostering for Hospital Doctors, Australian Medical Association, Canberra 1999 (website ref?)

Night Work Convention (no. 171), International Labour Organisation, Geneva, 1990

Night Work Recommendations (no. 178) International Labour Organisation, Geneva, 1990

Plain Language about Shiftwork, National Institute for Occupational Safety and Health, Washington, USA, 1997

Bulletin on Occupational Health and Safety, No.15, July 1996 – Shiftwork/Longer Hours, New Zealand Engineers Union

Scott, A.J. (ed), *Shiftwork*, Hanley & Belfus, Philadelphia, 1990

Wallace, Meredith, *OHS Implications of Shiftwork and Irregular Hours of Work: Part 1 – The Effects of Shiftwork on Health, Part 2 – Guidelines for Managing Shiftwork*. National Occupational Health and Safety Commission, 1998.
(available on NOHSC web site, <http://www.worksafe.gov.au>)

Waterhouse, JM, Folkard, S and Minors, DS., *Shift Work, Health and Safety - An Overview of the Scientific Literature 1978-1990*. Health & Safety Executive, London, 1992.

Wedderburn, A. *Guidelines for Shift Workers*. European Foundation for the Improvement of Living and Working Conditions, UK, 1991.

The various OHS authorities in the Australian states and territories have published guidance material on shift work. Most of these are based on the following publications from the Division of Workplace Health and Safety in Queensland. Contact your local authority for further advice on such materials.

Hints for shiftworkers, Division of Workplace Health and Safety, Brisbane, 1997

Managing shiftwork, Division of Workplace Health and Safety, Brisbane, 1997

The following publications provide useful introductions to union perspectives on OHS which are applicable to the hazards of shift work and extended working hours.

Identifying the Hazards of Work, ACTU OHS Unit, Melbourne, 1992

The Union Health and Safety Representative, ACTU OHS Unit, Melbourne, 1993

APPENDIX A

CHECKLIST OF EMPLOYER RESPONSIBILITIES

Employers should implement the following measures to control the risks associated with shift work and extended hours:

- Consultation with employees, their families and unions in the design of rosters, including all arrangements for monitoring and changing rosters.
- Formulation of rosters which do not result in excessive night work, excessive working hours, inadequate rest breaks and/or breaks between shifts.
- Expert advice on the effects of the work environment and working hours on fatigue and alertness.
- Provision to employees of professional advice and training on the health, safety and social effects of shift work, personal coping strategies and standard operating procedures that apply to specific shifts.
- Consideration of occupational exposure to noise, chemicals, temperatures and manual handling hazards on extended shifts.
- Adequate supervision, including regular contact with shift workers in isolated situations.
- Provision of a working environment that is safe and secure.
- Provision of rest areas and suitable meal facilities adapted to shift schedules.
- Provision of child care adapted to the needs of the employees at or near the place of work.
- Arrangements to ensure shift workers do not face transport difficulties, particularly night shift workers.
- Assistance with modification of employees' homes to minimise noise, light, heat and other distractions, so adequate sleep is possible.
- Establish systems to enable efficient and safe hand-over between shifts, and to ensure new shifts are adequately informed about all relevant workplace issues.
- Allow access by union representatives to the workplace during all shifts.

APPENDIX B

ADVICE FOR SHIFT WORKERS ON AVOIDING HEALTH AND SAFETY PROBLEMS

Even the best shift work rosters cause occupational health and safety hazards, particularly on night shift.

The main problems caused by shift work are:

- disrupted sleep patterns and lack of sleep
- fatigue and alertness difficulties
- increased use of alcohol and drugs to cope with these problems
- nutritional due to poor eating patterns
- no time or motivation for regular exercise.
- limited contact with family, friends or sexual partners

SLEEP DIFFICULTIES

The main causes of disrupted sleep patterns and lack of sleep are:

- poorly designed rosters
- having to adjust to conflicting family and social expectations
- trying to sleep at hours when your body is 'programmed' to be awake
- external noise, excessive light and high temperatures

Tips for good sleep:

One block of seven to eight hours uninterrupted sleep per day is preferable.

Good sleep is more likely if night time sleeping conditions can be simulated. Home modifications may be necessary and employers should be asked to subsidise the cost. Modifications may include:

- air conditioning
- heavy curtains and/or blinds
- an answering machine
- noise insulation, which may include carpet, acoustic tiles, double glazing or heavy curtains

It may also help if neighbours and friends are aware of your shift commitments.

Heavy smoking can lead to a mini nicotine withdrawal occurring during daytime sleep, and cause disrupted sleep as the body tries to wake to have a cigarette.

Strenuous exercise in the last 1-2 hours before bedtime raises the heart rate, blood pressure, etc., and makes sleep more difficult.

Caffeine is a stimulant which also makes sleep more difficult.

FATIGUE AND ALERTNESS

Staying alert during shift work should be addressed by providing adequate breaks during rosters. Nevertheless, shift workers will experience periods of reduced alertness, particularly on night shifts and extended shifts. When this occurs, take a break. Simple measures like standing up and walking around or washing your hand and face in cold water may help alleviate the symptoms.

Extra care is required if you are driving, either at work or on the way home. It is dangerous to drive while fatigued or feeling drowsy. Where practicable, the employer should arrange transport to and from work.

DRUGS AND ALCOHOL (Refer to AMWU Impairment at Work Policy)

Use of drugs or alcohol by workers trying to overcome the effects of fatigue, and/or of wakefulness at inappropriate times, is a hazard of shift work

Lack of sleep and fatigue can increase the effects of alcohol.

Alcohol within 1-2 hours of bedtime can also lead to disrupted sleep patterns.

Caffeine may provide increased temporary wakefulness, but general caffeine intake should be kept low to avoid sleep disruptions. Coffee, tea and many soft drinks have high caffeine concentrations.

The use of sleeping pills is hazardous:

- Some are highly addictive
- They may cause you to remain sleepy when it is time to wake up
- They cannot reset the body clock; using sleeping pills will not overcome the effects of your body's circadian rhythms

Substances such as amphetamines ("uppers" or "speed") are highly dangerous. As well as the risk of addiction, these drugs can cause high blood pressure, heart irregularities and mental confusion.

EATING PATTERNS

Easy access to nutritional food is often difficult for shift workers. The employer has a responsibility to ensure that meals are available, and should provide facilities for cooking and keeping food fresh.

A high percentage of shift workers report chronic stomach problems from disrupted eating patterns, and from the kinds of food they eat during the night and before bed.

Working shiftwork often requires eating at night when digestive processes slow down. Fatty or high-protein foods are not properly digested in these circumstances. It is preferable to eat main meals close to normal evening meal times, even if this is close to the beginning of the shift.

Some shift workers also gain weight because they eat their normal daytime meals and continue to snack at night.

EXERCISE & SHIFT WORK

Regular exercise is important for maintaining general health. Aerobic exercise has also been shown to assist shift workers by increasing sleep length and decreasing general fatigue, particularly for night workers. Regular exercise can also reduce musculoskeletal and psychological symptoms associated with shift work.

Regular aerobic exercise, in which the activity of the heart and lungs is increased, is beneficial for general health. Examples include brisk walking or jogging, cycling, swimming or aerobic exercise classes.

FAMILY AND SOCIAL LIFE

Lack of contact with family and friends is frequently reported as a down side of shift work. Additional effort and planning to spend time with friends and family may be necessary.

MEDICAL ADVICE

People who are experiencing difficulties coping with shift work or extended working hours should seek advice from their medical practitioner, and ensure that the practitioner knows their working arrangements.

