

Guidance for
Employers and
Employees on
**Night and
Shift Work**



Our vision:
A national culture where
all commit to safe and
healthy workplaces and
the safe and sustainable
management of chemicals

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The Health and Safety Authority (HSA) wishes to acknowledge the Health and Safety Executive's UK publication, *Managing shift work as a reference document* in parts of this guidance.

1. Introduction

The objective of this guide is to assist employers and employees and others to comply with health and safety legislation and in so doing to minimise any adverse effects of night and shift work. It is not intended as a legal interpretation of the legislation.

This guide will increase your understanding of night and shift work and its potential impact on health and safety. It will describe measures employers and employees can take at work to reduce any adverse effects of night or shift work.

It will assist employers in managing night and shift work so as to comply with the legislation and to prevent fatigue and any associated illness arising in employees. The guide gives practical advice on carrying out risk assessments, shift design and the maintenance of the work environment.

It also gives employees who carry out shift and night work advice on what they can do in relation to sleep and rest, health promotion, lifestyle, socialisation and family life in order to ensure a healthy and productive life.

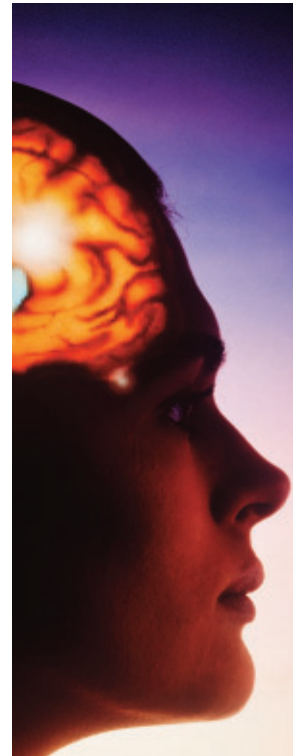
This guide should be read in conjunction with other legislation such as the Organisation of Working Time Act 1997, and associated guides.

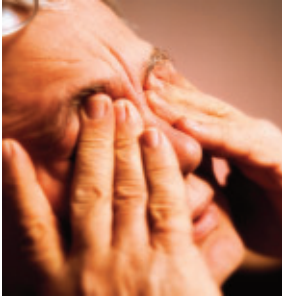
2. Background Information

Today an increasing number of workers do shift and night work as part of their work contract. There are a number of reasons for this and they include economies of continuous production, business needs, the need to provide a 24 hour commercial or emergency service, work life balance, and globalisation.

Shift and night work are common in sectors such as:

- 24/7 emergency services (e.g. ambulance, fire, hospital, police, prisons)
- 24/7 security services
- 24/7 utility services (e.g. electricity, gas, water)
- 24/7 production (e.g. chemicals, pharmaceuticals, manufacturing)
- Leisure and entertainment activities (e.g. bars, hotels, concerts, discos)
- Night work to ensure early next day service delivery (e.g. post, couriers, transport)
- Night work to ensure early next day product delivery (e.g. bakery, newspapers)
- Work across different international time zones (e.g. call centres, finance)
- Changing retail customer preferences (e.g. 24/7 supermarkets, garages)





It is estimated that in Ireland approximately 15% or 270,000 of the working population of 1.8 million workers do shift and night work on a regular basis and it is likely that this trend will increase over the coming years.

From the results of established evidence and reputable research it has become well known that shift and night work can lead to fatigue and other ill health effects and these are described in Section 3. The main cause is the disruptions of “circadian rhythm”, which leads to fatigue. Our circadian rhythm basically keeps the body in tune with daylight and night time hours. We have a natural inclination to be active during daylight hours and to rest and sleep at night when it is dark. The body clock is resistant to changes in this natural order of things. This is a reason why many find it hard to sleep during daylight hours after a night shift.

There are many different types of shift work, with variations in shift duration, number of shifts, shift rotation, rest periods between shifts and days off. The design of a particular shift pattern is a science in itself and will depend on many factors including business needs and the type of work being undertaken. As with other workplace hazards, the most important thing is to carry out a risk assessment and implement control measures to minimise any possible adverse effects arising from the particular shift pattern and work. Risk assessment and measures to minimise risk factors are described in the tables in Section 4 of this guidance. Shift workers themselves have a big role to play in promoting and maintaining their own health and Section 5 gives practical advice that will help them remain healthy.

Council Directive 93/104/EC sought to minimise the adverse effects of both excessive hours of work and also night and shift work in the EU. Member States implemented the provisions of this Directive in different ways. In England, the Working Time Regulations 1998 cover all these provisions. In contrast, in Ireland the Organisation of Working Time Act, 1997 stipulates maximum hours of work, minimum breaks and days off while the original Safety, Health and Welfare at Work (Night Work and Shift Work) Regulations 2000 were transposed into the Safety, Health and Welfare at Work (General Application) Regulations 2007 and deal specifically with night and shift work. These and other relevant legal provisions are outlined in Section 6 of this guidance. There is a requirement in the Night Work and Shift Work Regulations for employers to carry out a night worker health assessment and an example of one is outlined in Section 8.

There are a number of well established shift work assessment tools which can assist in identifying whether your existing shift schedule is likely to be causing fatigue in your workplace (see Section 7) and an actual case study is described in Section 9. Finally useful associated publications and sources of information are included in Section 10.

3. Effects of Night and Shift Work

3.1 Introduction

There is a considerable body of research evidence regarding the negative effects of night and shift work. These effects include:

- Disruption of the internal body clock (circadian rhythms)
- Sleeping difficulties
- Fatigue
- Health effects
- Individual factors
- Social and family factors
- Errors and accidents

These effects obviously do not happen to all night and shift workers and with proper management the risks can be minimised. Fatigue is the main issue which needs to be addressed.

3.2 Disruption of the internal body clock (circadian rhythms)

3.2.1 Biological clocks

A master clock in the brain coordinates the various body biological clocks so that they are in synch. The biological clocks in turn drive our circadian rhythms. The master clock consists of a group of nerve endings called the suprachiasmatic nucleus (SCN), which is located in the hypothalamus area of the brain close to the optic nerves.

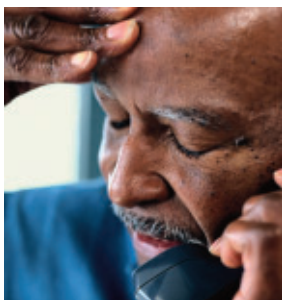
3.2.2 Circadian rhythms

Circadian rhythms are physical, mental and behavioural changes that follow roughly a whole day or twenty four hour cycle. Circadian rhythms are produced by natural factors in the body such as genetic activity and the release of the hormone melatonin, but they are also affected by signals from the environment, especially light. Light is the main cue influencing circadian rhythms, turning on and off genes that control the internal clocks. Circadian rhythms can change sleep-wake cycles, hormone release, body temperature and other important bodily functions.

Circadian rhythms are important in determining human sleep patterns. The body's master clock or SCN controls the production of melatonin that makes us sleepy. As it is located just above the optic nerves, which relay information from the eyes (external environment) to the brain, the SCN receives information about incoming light. When, there is less light, such as at night or in darkness, the SCN directs the brain to produce more melatonin, so you get drowsy or sleepy.

Melatonin, which is vital to the suppression of tumours, is released at night.





Light shuts down melatonin production, so being exposed to artificial light at night could lead to a melatonin deficiency.

Disruption of the circadian rhythm is linked to various sleep disorders such as insomnia, disrupted sleep-wake cycles and insufficient hours of sleep. Disrupted circadian rhythms are also associated with depression, bipolar disorder and seasonal affective disorder.

Night and shift work can cause disruption to the circadian rhythms. Basically if you are working at night, you are not sleeping when your body tells you should be. Conversely when you try to go to sleep during the day it is not easy as the circadian rhythm is telling you that you should be awake and this is supported by cues such as daylight and normal daytime external environmental activities such as traffic and noise, which make it more difficult to sleep.

Our internal body clocks can change gradually but are resistant to abrupt changes brought on by night and shift work. Nor will they ever fully adjust, even for those workers on permanent night shifts. Such workers may sleep during the day when they are on their rest period between shifts but on days off their body clocks will attempt to reset to normal circadian rhythms.

The end result of disruption of the circadian rhythms is loss of sleep and disturbed sleep, which both lead to fatigue.

3.3 Sleeping difficulties

We all need proper sleep in order to wake up refreshed and energised for the day's activities. Sleeping is restorative both physically and mentally. It allows the body to recover from the days exertions, be they physical or cognitive activities. People who have problems sleeping can become anxious and worried when they lie awake. They may get some broken periods of sleep but when they get up they are still tired and lack energy. Insufficient sleep is associated with tiredness leading to accidents and errors as the body and mind are out of tune with their environment.

Because of our circadian rhythms and external cues such as sunlight, temperature, voices, traffic, family and domestic responsibilities, it is much more difficult to get a proper sleep of sufficient duration without interruptions during daylight hours.

This lack of sleep leads to "sleep debt" whereby the body knows it has had insufficient sleep and although we can cope with this temporarily, eventually when working at night, we will feel a deep need of sleep and may fall asleep on the job despite other external cues. Recent cases from April 2011 where air traffic controllers in the US fell asleep at night when they were on duty highlight the issue and the associated danger.

Sleep deprivation affects our ability to think and concentrate and can lead to cognitive errors in tasks requiring concentration, fast reaction times, good memory function, vigilance, awareness and decision making.

3.4 Fatigue

Fatigue is the decline in mental and/or physical performance that results from prolonged exertion, lack of quality sleep or disruption to the circadian rhythms. It is a feeling of tiredness and being unable to work effectively. A fatigued person will be less alert and perceptive, less able to process information and have slower reaction times than someone who is not fatigued. A person who is fatigued may fall asleep momentarily while at work or driving home, which can be extremely dangerous.

Fatigue results from an imbalance between work demands and rest and recovery periods. Poorly designed shift work patterns and long working hours are likely to result in fatigue. Fatigue is the most common adverse effect of shift and night work.

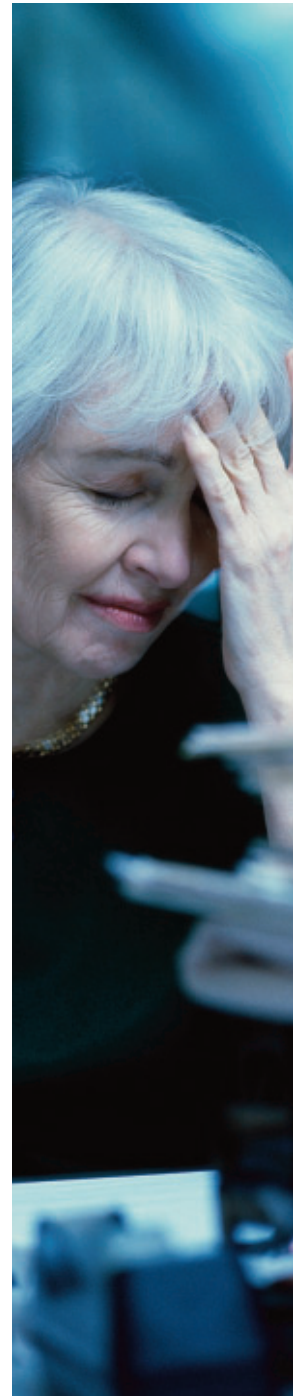
Fatigue can also lead to errors and accidents (see 3.8) while chronic fatigue is associated with a number of adverse health effects and illnesses outlined below.

3.5 Health effects

There are a number of well documented illnesses associated with night and shift workers, while other emerging risks are presently undergoing evaluation and research. Night and shift work are also known to exacerbate a number of pre-existing illnesses. The majority of illnesses are due to disruption of the circadian rhythms resulting in hormone imbalance (melatonin suppression), sleeping difficulties and fatigue.

Chronic fatigue resulting from night and shift work is strongly associated with gastrointestinal illnesses such as abdominal pain, chronic gastritis, peptic ulcers and cardiovascular illnesses such as hypertension and coronary heart disease. A recent study in 2011 by researchers from University College London found that working more than 11 hours places a person at a 67% higher risk of developing heart disease compared with those who work a typical 7 or 8 hours a day (Mika Kivimaki et al, "Using Additional Information on Working Hours to Predict Coronary Heart Disease: A Cohort Study", *Annals of Internal Medicine*, April 2011 154(7), 457–463).

There is strong evidence for reproductive problems in female shift workers, especially those carrying out night work. This is why under the Pregnancy at Work Regulations 2007, pregnant night workers can be moved to day work if it is the opinion of a doctor that the night work is having a detrimental effect on their health or the developing child.





Recent research in the US and Denmark found increased rates of prostate cancer in men and breast cancer in women who regularly carried out night work over a period of years. As a result the International Agency for Research on Cancer (IARC) of the World Health Organisation (WHO) classified night work as a probable carcinogen in 2009.

Subsequently, the Danish government paid out compensation to a number of female workers, mainly nurses and air flight attendants, who developed breast cancer and had carried out night work over many years. A recent report in 2010 by the HSEUK entitled The burden of occupational cancer in Great Britain attributes the largest number of occupational breast cancer deaths and registrations in women to shift work.

Shift work is also known to exacerbate pre-existing illnesses for night and shift workers. These include asthma, diabetes, epilepsy and psychiatric illness. This is why night workers have been given an entitlement to a health assessment under the Night Work and Shift Work Regulations to assess their suitability for such work before commencing work and then at regular intervals thereafter.

3.6 Individual factors

Individuals react differently to the effects of night and shift work. Workers who do the same shifts and same tasks can experience different health effects. Some will remain perfectly healthy while others may develop health problems. This reflects a combination of factors including: age, gender, lifestyle, attitude and behaviour.

Individuals' tolerance of shift work varies according to their:

- Ability to sleep (some people are good sleepers regardless while others find it difficult to fall asleep and even when they do, they wake up a number of times)
- Ability to adapt to changes in shift pattern
- Ability to adapt to shift work (which decreases with age anyway)
- Different life style behaviours (e.g. alcohol consumption, diet, levels of fitness)
- Different coping mechanisms

3.7 Social and family factors

Social and family factors can have a big impact on a shift worker's mental and physical health. Workers who don't have sufficient time to interact with their families and friends because of shift working and the need to rest in between may feel deprived and isolated, leading to moodiness and negativity. This can affect their relationships both at home and at work.

On the other hand, some workers will try to maintain a normal family and social life, but as a result not sleep sufficiently and end up fatigued. Thus there is a fine balance to be struck between these competing demands. The design of shift patterns can have a major impact in this area (e.g. 8 hour versus 12 hour, 2 daytime shifts not involving a night shift, no shift working at weekends, etc (see Section 4)).

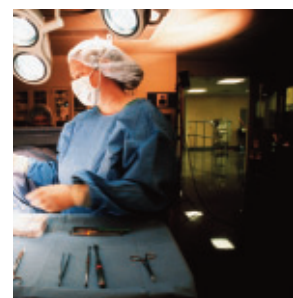
3.8 Errors and accidents

The risk of errors and accidents has been found to:

- Be higher on night shifts
- Rise with increasing shift length over an 8 hour threshold
- Increase over successive shifts (especially night shifts)
- Increase when there are insufficient breaks

The main cause is poorly designed shift schedules resulting in fatigue, which in turn leads to poor performance resulting in errors and accidents. These can be a mixture of minor and major incidents. Fatigue is a major contributory factor in road traffic accidents. Who has not experienced the feeling of nodding off while driving but luckily regaining alertness just in time?

Fatigue, night work and shift work arrangements have been found to be contributory factors to such well known incidents as Three Mile Island (nuclear power station release) in 1979, Bhopal (chemical plant explosion) in 1984, Challenger Space Shuttle (rocket explosion) in 1986, Chernobyl (nuclear power station release) in 1986, Clapham Junction (rail crash) in 1988, Exxon Valdez (ship oil spill) in 1989 and the Buncefield (oil refinery explosion) in 2005.



4. Risk Assessment

4.1 Introduction

Risk assessment in this context is the process of identifying the hazards associated with night and shift work in your workplace, assessing those risks, implementing measures to reduce and control them and reviewing the effectiveness of these arrangements.

In Section 3 the negative effects of night and shift work were outlined. By careful management of shift work, these effects can be minimised and workers can remain healthy and accidents and errors prevented. What is required is a commitment from management to address the risks and maintain workers safety, health and well-being. This should not just be seen as complying with a legal requirement but also as sound business practice as costs will be minimised by:

- Reduced sickness and absence
- Reduced staff turnover
- Reduced number of errors and accidents and their associated costs
- Having more healthy and productive workers

A four stage risk assessment process should be implemented:

1. Establish a system to manage the risks.
2. Assess the risks in your workplace.
3. Take action to reduce the risks.
4. Review arrangements regularly.

The employer or manager should be able to carry out the risk assessment without the need for external consultants as he or she should know the work processes better than anybody. These stages will be described in more detail below.

4.2 Establish a system to manage the risks

In order to address the risks arising from shift work, a systematic approach is advised comprising :

- Management commitment and resources
- Appointing a competent person to carry out the risk assessment
- Consultation and involvement of workers

Management need to make a commitment to carrying out risk assessments, addressing any issues identified, implementing any recommendations and providing any resources required (both personnel and finance). In larger organisations it may be practical to appoint a competent person who has knowledge of the legislation, the effects of shift work and the design of shift work schedules to carry out the risk assessment. In most cases the competent person should be a manager of the company and there should be no need for an external consultant.



It is vital that shift workers are consulted and involved in any decisions about shift work. Not only is this a legal requirement but also shift workers have the experience and knowledge which is vital to the overcoming of the actual effects of the shift work that they are doing on a regular basis and they will have opinions on the duration of shifts, their rotation, breaks and rest periods, work tasks, environment and welfare facilities.

Existing consultation arrangements may already be adequate but, if shift work is being introduced for the first time or major changes to existing shift schedules are planned, it may be prudent to set up a working committee comprising management and worker representatives and occupational health experts, if available. It should be kept in mind that workers often begin by resisting any proposed changes in their shift schedules even if there are likely benefits for the majority as they are comfortable with the way things are being done.

4.3 Assess the risks in your workplace

A risk assessment should take account of fatigue and the likelihood of it occurring as a result of shift work. It need relate only to night and shift work and need not take account of other workplace hazards, which should be addressed separately. For example, if there is a lot of manual handling which could cause fatigue, that should be included, but hazards relating to machinery should not.

The risk assessment will require the collection of information of both a technical and non-technical nature with the objective of determining if shift work is likely to cause fatigue in shift workers.

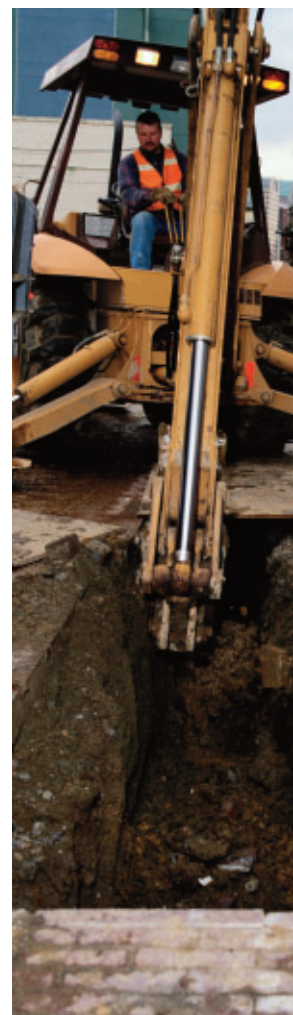
There are a number of well known risk factors for shift workers such as workload, work activity, shift pattern, rotation, timing and duration, rest breaks within and between shifts, physical environment, management issues and welfare, which will be described in much more detail in the tables in Section 4.4.1 below. These risk factors need to be considered as part of the risk assessment.

In addition you need to consider sensitive risk groups such as pregnant workers, younger and older workers, workers with pre-existing health conditions and new and temporary workers, who may be more at risk than other shift workers.

In order to identify trends associated with shift work, not only will you need to consider the risk factors and categories of employees outlined above, but you will also need to gather and use data from a variety of sources, including health assessments, sickness certificates, absence records and information on accidents, near misses, productivity, production and service quality.

4.4 Take action to reduce the risks

The tables in Section 4.4.1 describe risk factors associated with shift work and give



practical advice on how to control them. They also indicate specific legal requirements where they are applicable. The tables are summarised in Section 4.4.2 into two good practice guidelines, one on the design of the shift work schedule and the other on the shift work environment.

The tables will help you identify particular risk factors in your workplace. In some instances they give an evaluation of the relative risks of one factor over another (e.g. rotating shifts versus other shift patterns in Table 3). In others, such as Table 9, they illustrate how the failure to manage specific issues can increase the risks involved in night or shift work. Once you have identified the various risk factors, you need to make improvements to eliminate or reduce these risks. As previously stated, it is vital to consult shift workers in the risk assessment process and before implementing any improvements.

4.4.1 Risk factors

Table 1: Workload

Workload	Comments	Advice
Mental and physical demands	<p>Workers with an appropriate workload will be more effective and productive and less fatigued than those with too much or too little to do.</p> <p>Concentration and productivity tend to decline towards the end of the shift, or following lunch or during the night and early hours of the morning.</p>	<p>Plan an appropriate workload that accords with the length and timing of the shift.</p> <p>If practical, schedule demanding work for periods when workers are most alert and least likely to be fatigued.</p> <p>Where possible, demanding, dangerous and safety critical work should be avoided at night time, in the early hours of the morning or at the end of long shifts.</p> <p>Where work is particularly demanding, consider shortening the length of the shift.</p>

Table 2: Work activity

Work activity	Comments	Advice
Work activity	<p>Variation in work activity across a shift can help relieve fatigue, especially where a worker has a range of tasks to complete, each with different mental and physical demands.</p> <p>Alternating routine sedentary mental tasks with physical tasks can promote alertness and help relieve fatigue.</p>	<p>Where possible, schedule a variety of tasks into the shift and if practicable, allow workers some choice regarding their order of completion.</p>

Table 3: Shift pattern and shift rotation

Shift pattern	Comments	Advice
Regular shifts	Regular shifts allow a worker to adjust to a shift schedule to a certain degree, although any adjustment of the internal body clock will be lost during rest days if they revert to a normal diurnal cycle. Permanent night workers and early morning workers run the risk of chronic sleep debt, fatigue, ill health and disruption of family and social life.	Permanent night shifts should be avoided where possible. Ensure permanent night and early morning workers are aware of the risks through provision of information.
	Regular shifts allow workers plan family and social activities. They appeal to some but others prefer the flexibility of rotating shifts.	If practicable, offer workers the choice between permanent and rotating shifts.
	Regular shifts can create strong bonds within shift teams but may also allow poor attitudes and behaviour to develop leading to poor decision making.	Ensure there is adequate supervision.
	Regular shifts may lead to poor communication between different shift teams.	Ensure adequate time at shift handover so that new shift team is fully aware of any issues in previous shift.
Rotating shifts	Rotating shift schedules reduce the number of nights a worker has to work as night work is shared among all workers. However, the constantly changing shift pattern means workers may have difficulty adapting to the rotating schedule.	Plan the direction and speed of rotating shifts to assist a worker adapting to rotating shifts.
Forward versus backward rotation	There is some evidence that the internal body clock adapts more quickly to forward rotating schedules: i.e. where the worker progresses from morning to afternoon to night shifts.	Adopt forward rotating schedules where possible.
	Changing from an early to a later shift may result in reduced rest time compared with a backward rotating schedule.	Ensure there is adequate rest time between shifts to comply with the 1997 Act: i.e. a minimum period of 11 hours.
Fast versus slow rotation	Fast rotation of shifts minimises disruption of the internal body clock and there is little or no adaptation to night shifts and early morning starts.	Rotate shifts every two to three days where possible.
	Therefore direction of rotation may be less relevant for fast rotating shifts,	
	Weekly/fortnightly rotating shifts are the most disruptive schedule as the internal body clock starts to adapt and then has to readjust as the shift changes.	Avoid weekly/fortnightly rotating shift schedules where possible.
	Slow rotation of shifts maximises adaptation of the internal body clock. However, any adjustment to nights/early morning starts will be lost during rest days.	If fast rotation is not an option, then slow rotation over at least a three week period is the next best option.

Table 4: Shift timing

Shift timing	Comments	Advice
Night shifts	<p>Night shifts disrupt the internal body clock and night workers are likely to suffer from sleep loss, disrupted sleep and fatigue, which may cause ill health.</p> <p>The risk of errors and accident are higher at night because of fatigue and lack of alertness.</p>	<p>Permanent night shifts should be avoided where possible.</p> <p>Try to find alternatives to night work for those workers who cannot adapt to it.</p> <p>The Night Work and Shift Work Regulations make allowance for transfer to day work where a night worker becomes ill as a result of night work.</p>
	<p>Physically and/or mentally demanding or monotonous work will increase the risk of fatigue.</p>	<p>Avoid demanding, monotonous and safety critical work during the night and early morning hours where possible.</p>
	<p>Night work increases the risk of ill health and disrupts family and social life.</p>	<p>Provide workers with information about the risks of night work.</p> <p>In accordance with the provisions of the Night Work and Shift Work Regulations, ensure a health assessment is made available at regular intervals to night workers.</p>
	<p>Working at night may limit access to training and development and facilities such as staffed canteens and occupational health services.</p>	<p>Where possible, provide the same or similar facilities and opportunities for night workers and day workers.</p>
Early morning starts	<p>Although less disruptive than night work, early morning starts can also reduce sleep and increase the risk of fatigue and ill health. Commuting times and the lack of availability of public transport may add to the fatigue.</p>	<p>Avoid early morning starts before 7a.m. where possible.</p> <p>Consider providing transport to work.</p>
	<p>It may be difficult to sleep in the early evening leading to sleep loss and fatigue.</p>	<p>Provide information to workers on the risks of shift work.</p>
Afternoon starts	<p>Risk of fatigue is lower as there is less disruption to the internal body clock.</p> <p>Performance does not appear to suffer when compared with day shifts.</p> <p>However, they can reduce family and social contact.</p>	<p>Adopt afternoon starts in preference to night or early morning starts.</p>
Daytime shifts	<p>Preferred shift because it does not disrupt the internal body clock.</p>	<p>Adopt day shifts in preference to night, early morning and afternoon starts where possible.</p>

Table 5: Shift duration

Shift duration	Comments	Advice
Eight hour shifts	<p>Eight hour shifts are considered to be the optimum length for sustained and consistent work.</p> <p>They allow time for rest and daily family and social activities, but provide less work free days than 12 hour shifts.</p>	<p>There are few differences in the effects of 8 and 12 hour shifts on workers and there are no clear advantages to either system.</p> <p>Eight hour shifts are preferable when the work is monotonous, demanding (physically or mentally) or safety critical.</p>
Twelve hour shifts	<p>Twelve hour shifts require less work days per week than 8 hour shifts.</p> <p>However, fatigue can be an issue towards the end of a shift, especially if the work is physically or mentally demanding.</p>	<p>Avoid 12 hour shifts when the work is monotonous, demanding (physically or mentally) or safety critical.</p> <p>Provide frequent and regular breaks to reduce the risk of fatigue.</p> <p>Limit 12 hour night shifts to 2 to 3 consecutive nights where possible.</p>
	<p>Twelve hour shifts may increase the risk of fatigue in pregnant and younger and older workers.</p>	<p>Be aware of the needs of vulnerable workers and transfer them to shorter shifts if necessary.</p>
	<p>Workers should not have to work longer than 12 hours, do overtime or work on their free days.</p>	<p>Avoid shift overrun and overtime.</p> <p>Monitor shift swapping by workers.</p> <p>Discourage workers from doing second jobs on their free days.</p>
	<p>As fewer shift teams are required (2 versus 3 over 8 hour shifts) flexibility may be an issue.</p>	<p>Make adequate arrangements to cover absentees.</p> <p>Consider additional day shifts to allow for absentees, training and development.</p>
Shifts longer than 12 hour shifts	<p>Fatigue affecting alertness and performance becomes an issue for shifts longer than 12 hours.</p>	<p>Avoid shifts longer than 12 hours.</p> <p>It is likely workers will not get the required minimum rest period of 11 hours under the 1997 Act.</p>
Variable length shifts	<p>Variable length shifts can be a compromise between the relative advantages/disadvantages of 8 and 12 hour shifts and may be considered.</p>	<p>Variable length shifts may be considered, as long as it is remembered that they require more planning.</p>
Split shifts	<p>Split shifts where a worker works two shifts in a 24 hour period increase the risk of fatigue.</p>	<p>Avoid split shifts as they do not allow for adequate rest breaks between shifts.</p>

Table 6: Rest breaks within shifts

Rest breaks within shifts	Comments	Advice
	<p>The risk of fatigue increases towards the end of a shift and during the night. Frequent short regular breaks when adjusted to shift length can reduce fatigue, improve productivity and reduce the risk of errors and accidents especially for demanding and monotonous work</p>	<p>Under the 1997 Act workers are entitled to a 15 minute break after 4.5 hours and 30 minutes after 6 hours.</p> <p>Depending on the workload and length of shift, short regular breaks reduce the risk of fatigue.</p>
	<p>Giving workers some control over the length and regularity of breaks may reduce fatigue where work is self-paced.</p> <p>More frequent breaks towards the end of a shift may be advantageous.</p>	<p>Allow workers some choice over when they take a break.</p> <p>Where work is machine/system controlled and not self-paced, introduce frequent breaks into shift schedule.</p>
	<p>A short sleep period of 20 minutes (nap) may refresh the worker and reduce fatigue on night and long shifts.</p> <p>However, this needs to be monitored as longer sleep periods will result in the worker feeling unrefreshed and unalert.</p>	<p>Naps need close supervision and should not be allowed where safety critical decisions are made.</p> <p>If adopted, a break of 40 minutes is needed to allow workers a 20 minute nap and time to refresh themselves and regain alertness before resuming work.</p>
	<p>A break taken away from the work station is considered more beneficial.</p>	<p>Make facilities available which encourage workers to take their longer breaks away from their work station.</p>

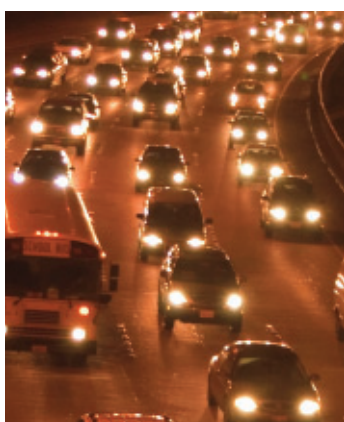


Table 7: Rest breaks between shifts

Rest breaks between shifts	Comments	Advice
Rest breaks between consecutive shifts	The risk of fatigue increases when the break between consecutive shifts is too short.	Ensure the minimum time between shifts is 11 hours in order to comply with the 1997 Act and allow workers time to commute, eat, sleep and enjoy family and social life.
Rest days	An excessive number of consecutive work shifts can cause fatigue. There is no optimal number as it depends on other risk factors such as workload, shift pattern and the work environment.	Normally, a limit of five to seven consecutive working days should be set for standard (seven to eight hour) shifts. Where shifts are longer, for night shifts and early morning shifts a limit of two to three consecutive shifts followed by two to three rest days may be preferable.
	Rest days are best when they allow the worker recover from a work schedule, take part in family and social activities and adjust to a new work schedule if required.	Under the 1997 Act, workers are entitled to a 24 consecutive hours rest period per week, although rest days may be averaged over a fortnight. When switching from day to night shifts or vice versa, make provision for a minimum of two nights of full sleep to enable workers adjust to a new schedule.
	Having free weekends (or at least one of the days off) is important for family and social activities.	The 1997 Act states the rest period shall be a Sunday unless otherwise provided in the employee's contract of employment.



A good work environment can reduce the risks associated with shift work as can competent management of such issues as supervision and staffing levels. In addition the provision of a health assessment and of workplace health promotion can prevent illness. These factors are addressed in tables 8 to 10.

Table 8: Physical environment

Physical environment	Comments	Advice
Facilities	Shift workers may not have the same access to meal and welfare facilities, first aid occupation health services and training and development as daytime workers.	Where reasonably practicable provide similar facilities. The requirements of the General Application Regulations (GAR) 2007, Regulations 18 to 25 (welfare and sanitary) and 163 to 166 (first aid) apply.
Lighting	Workplace lighting must be adequate to prevent accidents and eye strain. Natural lighting is preferable during daylight hours and artificial lighting must be adequate.	Minimum compliance with Regulation 8 GAR 2007.
	Bright lights (>6000 lux) have been shown to trigger changes in the internal body clock which may aid adaptation to night work by increasing alertness and reducing sleepiness.	This is a technical area requiring specialist advice.
Temperature	Room temperature should be comfortable: minimum 17.5C for sedentary office work and 16C for other sedentary work. Where physical work is carried out, a temperature of at least 13C, not requiring workers to wear thermal clothing.	Minimum compliance with Regulation 7 GAR 2007. Allow workers control of the temperature if possible. Often outside night temperatures are cooler than daytime and additional warmth may be needed.
Ventilation	Natural ventilation by fresh air is to be preferred; forced systems need to be well maintained and there should be no draughts.	Minimum compliance with Regulation 6 GAR 2007.
Humidity	Relative humidity should be between 40 to 70% .	Air should be neither too dry nor too moist.



Table 9: Management issues

Issue	Comments	Advice
Supervision	Supervisors should be aware of the risk factors associated with shift work and be able to recognise symptoms of fatigue in workers.	<p>Minimum compliance with S8 and S10 of The Safety, Health and Welfare at Work Act 2005.</p> <p>Shift supervisors should be trained to recognise risk factors leading to fatigue and be able to identify fatigued workers.</p> <p>Consider increased supervision during periods of low alertness, night and early morning, following lunch and towards the end of long shifts.</p>
Overtime	Overtime and extended work hours can increase the risk of fatigue in shift workers.	<p>Avoid overtime where possible by having relief available to cover absences, emergencies etc.</p> <p>If unavoidable, monitor individual hours worked to avoid excessive work hours especially where shift swapping is allowed.</p>
Shift swapping	Uncontrolled shift swapping can lead to excessive work hours and fatigue.	Monitor shift swapping to avoid excessive working hours.
Standby and on call duties	<p>Workers who stay at work on standby or are on call following a shift may be at risk of fatigue.</p> <p>Under the 1997 Act, workers required to be at the workplace, are deemed to be on working time.</p>	Ensure adequate rest periods are provided for workers on standby and on call.
Training and information	Information and training on risks associated with shift workers will increase understanding of fatigue and may assist workers in developing individual coping strategies.	<p>Minimum compliance with S8 and S10 of 2005 Act is required.</p> <p>Provide information to workers and their supervisors on the risks of shift work and any relevant risk factors identified.</p> <p>Encourage workers to report any shift related problems.</p> <p>Encourage workers to adopt healthy behaviours and coping strategies outside of work.</p>
	Access to daytime training may be limited, especially for those on permanent night shifts.	<p>Provide training during their shift if possible.</p> <p>If workers have to attend training during their rest period, compensatory time off must be given.</p> <p>Consider additional shift teams to facilitate attendance at training and development.</p>
Communication	Communication between shift workers on the same shift can help alertness and prevent isolation.	<p>Encourage team working if possible.</p> <p>Ensure lone workers are contacted at regular intervals during the shift.</p> <p>Provide remote workers with phones and/or means of communication.</p>
	<p>Handover of information between shifts is important for safety as it reduces errors and accidents.</p> <p>This is especially the case where there has been a malfunction or a safety system has been bypassed.</p>	<p>Ensure adequate time is allowed to share information between shifts.</p> <p>Having a short overlap at the end of one shift and the start of the next will assist.</p> <p>Ideally information handover should be person to person.</p>

Table 10: Health assessment, promotion and security

Health assessment, promotion and security	Comments	Advice
Health assessment	<p>A number of ill health effects are associated with night and shift work and it can exacerbate other pre-existing medical conditions.</p> <p>Particular groups of workers such as pregnant or younger and ageing are more vulnerable to the effects of shift work.</p>	<p>Comply with minimum requirements of Regulations 146 (health assessment for young persons), 151 (transfer to day work for pregnant workers) and 157 (health assessment for night workers) of GAR 2007 (see Section 6 of this guidance).</p> <p>Provide health assessment for night workers before starting work and at regular intervals.</p> <p>Transfer workers to day work where night shift causes or is likely to cause ill health effects.</p> <p>Encourage workers to inform their G.P. about their working arrangements.</p>
Health promotion	Workers who are fit and adopt healthy behaviours are less likely to get ill and may adapt more easily to shift work.	Where possible promote healthy behaviours such as healthy eating and exercise (see Section 5 of this guidance).
Security	Shift workers who work alone or at night and in the early morning may be more vulnerable to violence.	<p>Ensure car parks are well lit and secure (security cameras may assist).</p> <p>Design shift start and end times around availability of public transport if possible.</p> <p>If not, consider providing transport to and from work.</p> <p>Ensure lone workers have access to telephones and are contacted regularly during shifts.</p>



4.4.2 Good practice guidelines

The advice in tables 1 to 10 above on shift schedule design and the work environment can be summarised in the following two good practice guideline tables. These guidelines are general and may not be relevant to your own workplace. It may also be the case that more specific and detailed guidelines for your work sector are available.

It will not always be possible or practical to follow the good practice guidelines (e.g. accidents, emergencies, absences). Also you may have to balance the application of the good practice guidelines with your available resources. However, applying the good practice guidelines will help reduce the known risks associated with shift working by your employees.

Table 11: Good practice guidelines for shift work schedule design

Plan a workload that is appropriate to the length and timing of the shift.
If reasonably practicable, schedule a variety of tasks to be completed during the shift to allow workers some choice about the order in which they are done.
Avoid scheduling demanding, dangerous, monotonous and/or safety critical work during the night, the early morning, or towards the end of long shifts or during other periods of low alertness.
Avoid placing workers on permanent night shifts.
If possible, offer workers a choice between regular and rotating shift schedules.
Where possible, adopt a forward rather than a backward rotating schedule for rotating shifts.
Either rotate shifts very quickly, (e.g. every two to three days) or slowly (e.g. every three to four weeks) and avoid weekly/fortnightly shift schedules.
If unnecessary for business needs, try to avoid early morning starts before 7a.m.
Where possible, arrange shift start/end times to be convenient for public transport or consider providing transport for workers on particular shifts.
Limit shifts to a maximum of twelve hours (including overtime) and consider the needs of vulnerable workers.
Limit night shifts or shifts where work is demanding, monotonous, dangerous and/or safety critical to eight hours.
Consider if shifts of a variable length or flexible start/end times could offer a suitable compromise.
Avoid split shifts unless absolutely necessary for business needs.
Encourage and promote the benefits of regular breaks away from the work station.
Where possible allow workers some discretion over when they take a break, but discourage saving break time to leave work earlier.
In general, limit consecutive working days to a maximum of five to seven days and ensure there is adequate rest time between successive shifts.
For shifts longer than eight hours, for night shifts and shifts with early morning starts, it may be better to set a limit of two to three consecutive shifts.
When switching from day to night shifts or vice versa, allow workers a minimum of two nights of full sleep.
Build regular free weekends (or at least one weekend day) into the shift schedule.

Table 12: Good practice guidelines for shift work environment

Provide facilities and opportunities for shift workers which are similar to those for daytime workers.
Ensure that workplace lighting is adequate and adjustable by workers.
Ensure that workplace temperature is adjustable and allows workers carry out their work in reasonable comfort.
Consider increasing supervision during key periods of low alertness (night, early morning, end of long shifts and other periods of low alertness).
Ensure supervisors and team members with responsibility for shift working arrangements are aware of the risks of shift work and can recognise problems caused by shift work.
Control overtime and shift swapping by monitoring and recording hours worked and rest periods. Discourage workers from taking second jobs.
Make provision in the work schedule to allow adequate rest for those workers carrying out standby/on call duties or overtime.
Provide training and information to workers, management and supervisors on the risks associated with shift work and on coping strategies.
Make provision to release shift workers for training and development.
Encourage interaction between workers on the same shift and provide a means of communication for lone workers.
Agree timing and procedures for communicating information between successive shift teams and ensure they are followed at all times.
Encourage workers to inform their G.P. about their working arrangements.
Promote healthy living such as taking exercise and having a good diet.
Ensure health assessments are provided free for night workers at regular intervals.
Ensure that the workplace and its surroundings are well lit and safe and secure so that shift workers are not at risk of violence.

4.5 Review arrangements regularly

4.5.1 Encourage early reporting of any problems associated with shift work

Implementing the four step risk assessment process described above will reduce the risk of problems associated with shift work. However, no system is perfect and workers should be encouraged to report any personal, shift schedule or shift environment problems as early as possible.

Some workers may be reluctant to report personal health problems to their supervisor or manager and would prefer to discuss it as part of their health assessment with a doctor. The doctor does not report the medical condition to the employer as this is a matter of doctor/patient confidentiality, but rather whether the worker is fit/unfit for work and whether unfitness may be work related.

Shift supervisors have a role in identifying and reporting problems.

4.5.2 Monitor changes to shift work schedules and work environment

Sometimes it will be necessary for business or other reasons to alter the shift schedule or make changes to the work environment. Workers should be consulted in advance on the proposed changes and their rationale as this will encourage acceptance.

While these changes may bring about improvements, they may also create new problems. Therefore it is important to monitor the changes and collect information on their effectiveness. Table 13 gives some indicators that could be measured. However, it may be the case that there are specific company measures that can be monitored.

Table 13: Indicators and measures of success

Indicator	Measures of success
Fatigue schedule have reduced fatigue.	Use assessment tools (Section 7) to identify if changes in shift work
Sleepiness at work	Use assessment tools (Section 7) to determine levels of sleepiness
Accident, near misses and safety critical events	Do records show a reduction in accidents, near misses and safety critical events?
Absenteeism	Do records show a decrease in absenteeism?
Staff turnover	Do records show a decrease in staff turnover?
Employee welfare	Use focus groups, interviews, questionnaires and observation to determine if workers view the shift work arrangements positively.
Performance and productivity	Do records show an increase in performance and productivity?

4.5.3 Review effectiveness of existing arrangements periodically

Regardless of whether there are changes made to the shift schedule or environment, you will need to periodically monitor the effectiveness of existing arrangements. People can become complacent and standards can slip despite your best intentions.

5. Practical Advice for Employees

5.1 Introduction

This section aims to give practical advice to workers who carry out night and shift work on a regular basis on measures they can take to maintain and improve their health and minimise any adverse effects of their work.

5.2 Driving to and from work

Fatigue increases the risk of having a vehicle accident, especially after a long shift or night work or before commencing an early shift. Therefore you should consider measures to remove or reduce this risk:

- Get a lift, or use public transport or a taxi if possible
- Share lifts
- Drive carefully and do not speed
- Do not drive if overtired
- Stop for a quick rest if you feel sleepy while driving

5.3 Sleep pattern

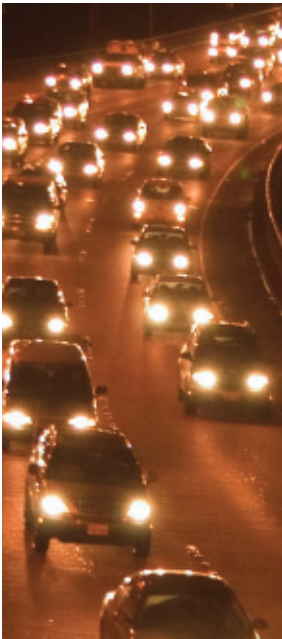
Try to develop a regular sleep pattern including at least seven to eight hours sleep. If you cannot sleep make sure you are at least resting. Find out the best time for you to sleep and stick to this pattern.

- Find out if you sleep better by going to bed soon after returning home from work or waiting up and going to sleep before the next shift
- Have a short sleep before your first night shift
- Have a short sleep after coming off night shifts and go to bed early that night

5.4 Sleep environment

Creating the right environment will help you to sleep and rest. Daytime cues make it more difficult to sleep and therefore should be minimised.

- Use your bedroom for sleep and not as an entertainment room (e.g. no television)
- Avoid falling asleep in the living room
- Choose a quiet room as your bedroom, where there is least disturbance from outside and internal noise and sounds
- Blackout the bedroom as much as possible to keep out daylight, this will help you sleep and encourage melatonin production, vital for the suppression of tumours
- Consider using heavy curtains or blinds, which can help in blacking out the room
- Put your mobile on silent and landline ringing volume on low



- Ask your family to keep the noise levels down from voice, radio, television and not to disturb you
- If necessary let your neighbours know your schedule and request them to avoid use of noisy machines such as grass mowers and power tools when you should be sleeping
- If they have a dog that barks a lot, ask them to bring it inside if possible
- Use ear muffs and eye shields if necessary
- Maintain a cool temperature: not too warm in the bedroom

5.5 Promoting sleep

There are a number of things you can do to promote sleep:

- Do some gentle exercise such as a short walk (but don't over exercise as it stimulates the body and raises temperature)
- Get relaxed by reading or listening to music or watching a television programme
- Have a shower or bath
- Avoid drinking caffeine or other stimulants a few hours before going to sleep
- Drink very little alcohol as it reduces the quality of sleep (see Section 5.7 stimulants and sedatives)
- If you are hungry eat a light meal; don't go to bed hungry or overfed

5.6 Diet

Digestive problems are common with shift workers both because of the timing of meals and the quality of food. Plan your meals so that they help keep you alert at work and sleep and rest during your rest period.

- Eat regular light meals as heavy meals can cause drowsiness
- Avoid fatty foods as they are more difficult to digest
- Choose foods that are easily digestible such as pasta, rice, bread, fruit and vegetables
- Avoid sugary foods, which do provide a short energy boost, but then cause a dip in energy levels
- Eat plenty of fruit and vegetables, which are a good option as their sugar is converted slowly into energy and they also provide vital vitamins, minerals and fibre
- Drink plenty of water to avoid dehydration which affects both physical and mental performance; add a sweetener if you don't like water
- However, don't drink too much before sleeping as it will result in you waking up early to relieve your bladder





5.7 Stimulants and sedatives

Caffeine and cigarettes are stimulants which can keep you alert while alcohol and sleeping pills are sedatives which make you drowsy and sleepy. However, they should be avoided as regular use reduces these effects and can lead to dependence and associated health problems.

- Caffeine is a mild stimulant found in coffee, tea, cola, energy drinks and in tablet form. It can improve reaction time and feelings of alertness for short periods. Occasional use of caffeine is fine, but it should not be used to keep you awake. You also need to be aware of what might happen when its effects wear off
- Alcohol can promote the onset of sleep. However, it is associated with waking up early, disrupted sleep and poorer sleep quality. Excessive use can result in dependency and addiction and lead to long-term damage to your physical and mental health, work performance and family and social relations
- Regular use of sleeping pills can lead to dependency and addiction

5.8 Physical activity

Regular exercise keeps you fit, burns off calories and helps you sleep. Regular exercise promotes a healthy heart and keeps weight down, thereby reducing the risk of diabetes. At least 30 minutes daily exercise is recommended and this can be split into two if necessary. Exercise can be as simple and inexpensive as a walk, jog, cycle, or exercising at home. Bringing the family dog on a daily walk is both beneficial to you and the dog.

Joining a sports club or gym should be considered. It does not take long to play a game of squash, tennis, badminton or volleyball where the physical activity levels are high. Swimming is good as you use most of the muscle groups. A gym instructor will develop your own personal fitness plan to suit your needs. Indoor soccer is also a good way of keeping fit, especially as it can be played all year.

If possible it is recommended that physical activity is carried out with a friend or colleague as it leads to social interaction, which is beneficial not only for physical but also mental health.

5.9 Social support

Shift work can result in you becoming isolated from regular contact with your family and friends:

- Let your family and friends know about how shift work affects you. If they understand the problems, they can be more supportive

- Let them know your shift schedule well in advance. This means that social and family activities can be planned around your shift schedule
- Get involved as much as possible with family activities such as meals, household chores, sport and going out together
- Plan your domestic chores and duties so that they do not disrupt your rest and sleep schedule
- Try to carry out some social activities with work colleagues who share similar shift schedules to you as they may be available when family and friends are not

5.10 Keeping alert at work

There may be periods during shift work, especially early morning and night work, when it is difficult to keep alert. This can affect your work performance and increase the risk of errors and accidents.

- Exercise lightly before starting work
- Keep light levels bright
- Maintain adequate room temperature and ventilation
- Take regular short breaks if allowed
- Walk away from your work station during breaks
- If possible do more stimulating work when you begin to feel drowsy
- Keep in contact with colleagues



6. Legal Requirements

6.1 Legislation

The Safety, Health and Welfare at Work Act 2005 (No.10 of 2005) applies to nearly all workplaces. The 2005 Act places general duties on employers to provide a safe place of work, carry out risk assessments and prevent accidents and illness at work. Employees also have duties under the 2005 Act including cooperating with their employer on matters of health and safety. In addition a number of specific sets of regulations have been made under the 2005 Act, including the Safety, Health and Welfare at Work (General Application) Regulations 2007 (S.I. No. 299 of 2007), referred to hereafter as the 2007 Regulations.

Council Directive 93/104/EC concerning certain aspects of the Organisation of working time to ensure workers safety and health was originally transposed into Irish law by the Organisation of Working Time Act (No. 20 of 1997) and the Safety, Health and Welfare at Work (Night Work and Shift Work) Regulations 2000 (S.I. No. 11 of 2000).

The 1997 Act lays down minimum daily, weekly and annual periods of rest and breaks and maximum limits on weekly hours of work to ensure workers safety and health. These provisions are enforced by the National Employment Rights Authority (NERA).

The Organisation of Working Time (General Exemptions) Regulations 1998 exempted persons employed in certain activities from the provisions of the 1997 Act dealing with daily rest, rest intervals at work, weekly rest, and nightly working hours subject to being granted equivalent compensatory leave.

The Night Work and Shift Work Regulations 2000 sought to minimise the well documented detrimental effects of night and shift work on workers health. These provisions are enforced by the Health and Safety Authority (HSA). In 2007, these regulations were consolidated into Chapter 3, Part 6 of the 2007 Regulations (Night Work and Shift Work). The provisions did not change.

Also there is an entitlement in Chapter 2, Part 6 of the 2007 Regulations (Protection of Pregnant, Post Natal and Breastfeeding Employees) relating to the transfer of pregnant night workers to day work when certified by a doctor.

Finally under Chapter 1, Part 6 of the 2007 Regulations (Protection of Children and Young Persons), an employer must make available a health assessment to a child or young person before assignment to night work and at regular intervals thereafter.

6.2 Organisation of Working Time Act 1997

The main provisions of the 1997 Act are as follows:

- An employee is entitled to a daily rest period of at least 11 hours in each period of 24 hours
- An employee is entitled to a break of at least 15 minutes after working for 4.5 hours
- An employee is entitled to a break of at least 30 minutes after working for 6 hours; this may include the 15 minute break referred to above
- Generally, an employee is granted a rest period of at least 24 consecutive hours in each period of 7 days, and this period is immediately preceded by the daily rest period of at least 11hours

- In lieu of above, the employee is granted 2 rest periods of at least 24 hours each in the following period of 7 days
- If the 2 periods are consecutive, they should be preceded by a daily rest period of at least 11 hours
- If the periods are not consecutive, each should be preceded by a daily rest period of at least 11 hours
- Generally, the 24 hour rest period should be a Sunday except as otherwise provided in the employee's contract of employment
- Generally, an employee is not to work more than an average of 48 hours in each period of 7 days, this average calculated over a reference period that does not exceed 4 or 6 months or a period specified in a collective agreement
- A night worker should not work more than 8 hours in each 24 hour period if the work involves special hazards or a heavy physical and mental strain (special category night worker)
- Otherwise a night worker should not work more than an average of 8 hours calculated over a reference period that does not exceed 2 months or a longer period specified in a collective agreement
- Collective agreements can be approved by the Labour Court

6.3 Organisation of Working Time (General Exemptions) Regulations 1998

These regulations prescribe that persons employed in the activities specified in the Schedule to these regulations are exempt from the application of sections 11, 12, 13 and 16 of the 1997 Act, which deal with daily rest periods, rests and intervals at work, weekly rest periods and night time working hours respectively. They are not exempt from other provisions of the 1997 Act, which continue to apply.

Such exempt activities include:

- Regular travel of long distances to and from work or from one workplace to another
- Security
- Activities in which rate of production or provision of services varies significantly from time to time
- Activities requiring continuous production or continuous provision of services is required
- Reception, treatment or care of persons in a residential institution, hospital or similar establishment
- Provision of services at a harbour or airport
- Production in the press, radio, television, cinematographic, postal or telecommunications industries
- Provision of ambulance, fire and civil protection services
- Production, transmission or distribution of gas, water or electricity
- Collection of household refuse or operation of an incinerator plant
- Any industrial activity in which work cannot be interrupted because of its technical nature, research and development
- Agriculture
- Tourism

In these cases, the employer is required to provide the employees with equivalent compensatory rest periods and breaks.

6.4 The Safety, Health and Welfare at Work (General Application) Regulations 2007, Chapter 3 of Part 6: Night Work and Shift Work

The Night Work and Shift Work Regulations impose duties on an employer in relation to employees who are defined as night workers (see below) and shift workers. These include carrying out a risk assessment and implementing protective measures for both night and shift workers; making available a health assessment and possible changes to working conditions and transfer to day work where a doctor is of the opinion that a night worker is, or could become, ill as a result of night work.

The provisions of each regulation are described in more detail below.

(In this guide, the text of Acts and regulations is shown in italics.)

6.4.1 Regulation 153: Interpretation for Chapter 3

In this Chapter:

“1997 Act” means the Organisation of Working Time Act 1997 (No. 20 of 1997);

“night work” and “night worker” have the same meaning as they have in the 1997 Act;

“shift work” and “shift worker” have the same meaning as they have in the 1997 Act.

“Night work” and “night worker” are defined in section 16 of the 1997 Act as follows:

“Night time” means the period between midnight and 7am on the following day.

“Night work” means work carried out during “night time”.

“Night worker” means an employee:

- *who normally works at least 3 hours of his or her daily working time during night time*
- *and the number of hours worked by whom during night time, in each year, equals or exceeds 50% of the total number of hours worked during that year.*

Many employees who work at night don't meet the second criteria and are not defined as night workers and therefore are not subject to some of the requirements of the regulations (e.g. provision of a health assessment). Employees who work a regular rotating three shift system (6am to 2pm, 2pm to 10pm, 10pm to 6am) work less than one third of their annual hours between midnight and 7am and so, although they are shift workers, they are not deemed to be night workers.

“Shift work” and “shift worker” are defined in Article 2 of Council Directive 93/104/EC as set out in the Sixth Schedule of the 1997 Act as follows:

“Shift work” means any method of organising work in shifts whereby workers succeed each other at the same work stations according to a certain pattern, including a rotating pattern, and which may be continuous or discontinuous, entailing the need for workers to work at different times over a given period of days or weeks.

“Shift worker” means any worker whose work schedule is part of shift work.

“Shift work” according to HSEUK is usually regarded as:

- Work undertaken outside of standard daytime hours, where there may be a handover of work from one person or group to another **or**
- A pattern of work where one employee replaces another on the same job within a 24 hour period

“Standard daytime work hours” according to HSEUK are normally considered to be an eight hour period between 7am and 7pm with two distinct periods, one in the morning, and the other in the afternoon separated by a lunch break.

6.4.2 Regulation 154: Application of Chapter 3

This Chapter applies in respect of—

- (a) an employee and employer to whom the 1997 Act applies, and*
- (b) a self-employed person.*

These regulations apply to both employees and the self-employed alike and private and public workers.

The regulations do not apply to:

- Those not covered by the 1997 Act
- Members of the Defence Forces or An Garda Síochána
- Some transport employees
- Those who control their own working hours
- Family employees working on a farm or in a private house

6.4.3 Regulation 155: Night work risk assessment

For the purposes of section 16(2)(a) of the 1997 Act, an employer shall carry out, in compliance with section 19 of the Act, a risk assessment, taking account of—

- (a) the specific effects and hazards of night work, and*
- (b) the risks to the safety and health of the employee concerned that attach to the work that a night worker is employed to do, so as to determine whether that work involves special hazards or a heavy physical or mental strain.*

The employer is required to carry out a night work risk assessment for work carried out at night time (midnight to 7am) to determine whether that work involves special hazards or a heavy physical or mental strain. This applies for both shift and night workers. Special hazards could be environmental factors such as lighting levels or temperature. Excessive manual handling or working at an excessive pace on a picking line are examples of a heavy physical strain. Boring, repetitive, monotonous work or work requiring quick decision making based on assessing a lot of changing information are possible indicators of a heavy mental strain. These hazards could have a more pronounced effect on night workers as compared with shift workers because of the longer duration of exposure to them at night time and the risk of fatigue.

The tables in Section 4 give a good indication of the specific risk factors associated with night work.

6.4.4 Regulation 156: Protective or preventive measures with respect to night workers and shift workers

An employer, taking account of the risk assessment under Regulation 155, shall—

(a) take such steps as, having regard to the nature of the work concerned, are appropriate for the protection of the safety and health of a night worker or an employee who is a shift worker, and

(b) in taking steps to comply with section 18 of the Act, have regard to the employer's duty under paragraph (a).

Under section 18 of the 2005 Act, the employer must appoint a competent person, preferably in the employer's employment, to implement protective and preventive measures for night and shift workers. This person must take account of the risk assessment carried out under Regulation 155 and ensure the protective and preventive measures are adequate for both shift and night workers.

6.4.5 Regulation 157: Health assessment and transfer to day work

(1) An employer.

(a) before employing a person as a night worker, and

(b) at regular intervals during the period that that person is employed as a night worker,

shall make available to that person, free of charge, an assessment by a registered medical practitioner, or a person under the practitioner's supervision, in relation to any adverse effects of that night work on the night worker's health.

This requirement applies to those employees defined as night workers under the regulations. Before a night worker commences work and at regular intervals (usually not less than every three years, although this may vary in line with results from risk assessments), the employer must offer the employee a health assessment by a doctor or a person under the doctor's supervision, to determine any adverse effects of night work on the employee's health. The initial health assessment will determine if there is any underlying medical reason why the employee should not carry out night work. This could be a pre-existing medical condition which night work could affect adversely. The follow up assessments are a form of health surveillance in that they seek to determine if the night work is having a detrimental

effect on the night worker's health. The assessment must be provided free of charge to the employee. Section 8 of this guidance describes one method of carrying out such a health assessment.

(2) In discharging the duty under paragraph (1) the employer—

(a) may take into account any entitlement to an assessment referred to in that paragraph that is provided by the State, and

(b) shall facilitate the night worker's attendance at the assessment if so required.

It may be that the health assessment is provided by the State. If the assessment is only available during the day, the employer must make arrangements to allow the night worker attend. This would generally only be an issue for permanent night workers as those who also carry out day work can be facilitated to attend the assessment during a day shift.

(3) The person who performs an assessment referred to in paragraph (1) shall—

(a) endeavour to detect if the health of the employee concerned is being or will be adversely affected by the fact that the employee performs or will perform night work, and

(b) on the completion of the assessment, inform the employer and employee concerned—

(i) of the opinion of the person who performs the assessment as to whether the employee is fit or unfit to perform the night work concerned, and

(ii) if that opinion is that the employee is unfit to perform that night work by reason only of the particular conditions under which that work is performed, suggesting changes in those conditions that could be made so that the employee could be considered fit to perform that night work.

The doctor or the person who carries out the health assessment will try to determine whether the night work is or could be detrimental to the night worker's health. Following the assessment, the doctor will inform both the employer and the employee whether the employee is fit or unfit to carry out night work.

If it is the opinion of the doctor that the employee is unfit only because of the particular conditions in which the night work is carried out, he/she can suggest changes to those conditions so they will not adversely affect the employee's health and in turn so the employee can be considered fit for night work.

(4) Neither a registered medical practitioner nor a person acting under his or her supervision shall disclose—

(a) the clinical details of the assessment referred to in paragraph (1) to any person other than the employee concerned or a person designated under section 63 of the Act, or

(b) the opinion of the registered medical practitioner of such an assessment to any person other than the employee and employer concerned.

The doctor is only entitled to inform the employer of the employee's fitness or unfitness for work. He or she is not entitled to disclose the employee's clinical details to the employer.

Clinical details of the health assessment may only be disclosed to the employee or a doctor designated by the HSA to receive such details in accordance with section 63 of the 2005 Act.

(5) If a night worker—

(a) becomes ill or otherwise exhibits symptoms of ill-health, and

(b) that illness is or those symptoms are recognised as being connected with the fact that the night worker performs night work, the employer, whenever possible, shall assign duties to the employee that do not involve performing any night work and to which the employee is suited.

Where a night worker becomes ill and there is clear medical evidence linking the illness or symptoms with night work, the employer must reassign the employee to other duties to which he or she is suited and which do not involve night work, wherever this is possible.

6.5 Regulation 151 of the Safety, Health and Welfare at Work (General Application) Regulations 2007, Chapter 2 of Part 6: Protection of Pregnant, Post Natal and Breastfeeding Employees

6.5.1 Regulation 151: *Night work*

(1) In this regulation "night work" means work in the period between the hours of 11 pm on any day and 6 am on the next following day where—

(a) the employee works at least 3 hours in that period as a normal course, or

(b) at least 25 per cent of the employee's monthly working time is performed in that period,

Night work is defined in these regulations as from 11pm to 6am whereas in Night Work and Shift Work Regulations it is defined as from midnight to 7am.

(2) An employer shall—

(a) if a registered medical practitioner certifies that it is necessary for the safety or health of an employee that she should not be required to perform night work during pregnancy or for 14 weeks following childbirth not oblige her to perform night work during that period, and

(b) in a case to which paragraph (a) relates—

(i) transfer the employee to daytime work, or

(ii) where such a transfer is not technically possible or objectively feasible on duly substantiated grounds, or both, grant the employee leave or extend the period of maternity leave.

If an employee has a medical certificate stating that for health and safety reasons she is not required to perform night work during her pregnancy or for 14 weeks afterwards, the employer must remove her from night work by

either transferring her to daytime duties or if this is not feasible by granting the employee leave. The employee concerned may have an entitlement to health and safety leave under maternity protection legislation in these circumstances.

6.6 Regulations 143 and 146 of the Safety, Health and Welfare at Work (General Application) Regulations 2007, Chapter 1 of Part 6: Protection of Children and Young Persons

6.6.1 Regulation 143: interpretation for Chapter 1

"night work" means—

- a) in the case of a child, any work between 8 pm on any one day and 8 am on the following day, and*
- b) in the case of a young person, the hours mentioned in paragraph 9(b) of section 6(1) of the Protection of young Persons (Employment) Act 1996 (No. 16 of 1996) as qualified by that section and sections 7 and 8 thereof.*

"child" means a person resident in the state who is under 16 years of age.

"young person" means a person who has reached 16 years of age but is less than 18 years of age.

The definition of night work for a child is any work between 8pm and 8am. However, under the Protection of Young Persons (Employment) Act 1996, children (14 and 15 year olds) are generally only allowed work between the hours of 8am and 8pm, so they should not be carrying out night work.

Night work for young persons (16 and 17 year olds) extends from 10pm to 6am. Young persons are generally only allowed to work between the hours of 6am and 10pm but there are some exceptions (e.g. licensed premises).

6.6.2 Regulation 146: Health surveillance

An employer shall—

- a) where a risk assessment reveals a risk to safety or health or to the physical or mental development of a child or young person, make available health surveillance in accordance with section 22 of the Act*
- b) make available to a child or a young person a free assessment of his or her health and capabilities before assignment to night work and at regular intervals thereafter*
- c) inform a child or young person of the result of any health surveillance or health assessment carried out in accordance with paragraphs (a) or (b) and in the case of child, inform the parent or guardian of the child of the results of any health surveillance or health assessment.*

In relation to b) above, the employer must make available an assessment of the health and capabilities of any child or young person prior to them carrying out night work (as defined in Regulation 143 above) and at regular intervals thereafter. Furthermore, the child or young person must be informed of the result of the health assessment and also the parent or guardian in the case of a child .

7. Shift Work Assessment Tools and Techniques

There are a number of tools and techniques available to help both organisations and individuals assess the risks associated with shift work that lead to fatigue. These range from the simple Epworth Sleepiness Scale based on an individual questionnaire to organisational shift design factors in the HSEUK's Fatigue and Risk Index Tool (see below for examples).

Tools that assess the risks of particular shift schedules generally use mathematical modeling to assess the influence of factors such as time and duration of shift, number and length of rest breaks, rest days and cumulative fatigue (the buildup of fatigue from sleep disruption).

Health assessments (see Section 8) carried out by Occupational Health can also be used to assess and manage the risks associated with shift work.

7.1 List of shift work assessment tools and techniques

1) HSEUK's Fatigue and Risk Index Tool

This contains two indices: the Fatigue Index incorporates factors known to be related to the buildup of fatigue including shift timing, shift duration, breaks, rest periods, cumulative fatigue (the buildup of fatigue from sleep disruption) and the workload; the Risk Index is based on occupational injury data and is expressed in terms of the relative risk of an incident occurring.

The development of a fatigue/risk index for shift workers RR446/2006 is available from www.hse.gov.uk/research/rrhtm/index.htm

An electronic version is available at www.hse.gov.uk/research/rrpdf/rr446cal.xls

2) Epworth Sleepiness Scale

A simple questionnaire is completed which provides a measure of an individual's general level of daytime sleepiness. See Johns, M. W., "A new method for measuring daytime sleepiness: the Epworth sleepiness scale", *Sleep*, 1991 14 (6), 540–545.

3) The Standard Shift Work Index

This is a more complex survey tool used for assessing large groups of workers.

See Barton, J., Spelten, E., Totterdell, P. et al, "The Standard Shift Work Index: A battery of questionnaires for assessing shiftwork-related problems", *Work and Stress*, 1995 9 (1), 4–30.

4) Swedish Occupational Fatigue Inventory

Again this is a more complex survey tool used for assessing large groups of workers.

See Ahsberg, E., Garnberale, F. and Kjelberg, A., "A Perceived Quality of Fatigue During Different Occupational Tasks, Development of a Questionnaire", *International Journal of Industrial Ergonomics*, August 1997 20 (2), 121–135.

8. Procedure for Night Worker Health Assessment

8.1 Introduction

This procedure is an example of the steps involved in the health assessment of night workers carried out by Occupational Health. Occupational Health is a medical service carried out by a healthcare professional (nurse or a doctor). Occupational Health may be a full-time or contracted service for a specified number of hours per year depending on the size of the company. The normal rules of medical confidentiality apply to a health assessment carried out by Occupational Health.

The purpose of the procedure is to:

- Determine whether an employee is fit to carry out night work
- Ensure that night work is not adversely affecting an employee's health
- Identify employees with a disability who may be able to commence or continue night work after reasonable adjustments are made
- Perform an assessment of risk to health for employees to commence or continue to work nights

The definitions of night time (period between midnight and 7am on the following day) and night worker (employee who normally works more than three hours during night time and at least 50% of total hours worked in a year is at night time) are taken from the Organisation of Working Time Act 1997. These definitions exclude many employees who work rotating shifts and it is recommended that a health assessment is made available to all workers who carry out shift work.

8.1.2 Procedure steps

1. The employee is asked to complete a short health questionnaire (Section 8.2) and returns it to Occupational Health.
2. If the employee wishes to avail of the health assessment or answers yes to any of the questions in the short questionnaire, he/she is asked to complete a more detailed health assessment questionnaire (Section 8.3) and return it to Occupational Health for assessment.
3. Occupational Health may then:
 - Request further details of the risk assessment from the employer
 - Request additional information from the employee
 - Obtain further information from the employee's GP or specialist with the employee's written consent
 - Refer the employee to an occupational physician
4. Based on the above, a review form (Section 8.4) will be completed by Occupational Health and returned to the employer.



8.2 Occupational Health night worker health questionnaire

To the Night Worker

The purpose of this short health questionnaire is to ensure that you are fit for night work. As a night worker, you are entitled under the Safety, Health and Welfare at Work (General Application) Night Work and Shift Work Regulations 2007 to a health assessment before starting night work and at regular intervals thereafter. You do not have to avail of the assessment but your employer must offer it to you.

Following completion of this short questionnaire, you will have the option of being referred to Occupational Health for further assessment. As part of this further assessment you will be asked to complete a more detailed questionnaire and it may be recommended that you undergo a medical examination or interview.

Personal Details

Name:

Employee No:

Department:

DOB:

Telephone:

Do you currently suffer from any of the following?

- Diabetes
- Epilepsy
- Disease of the heart or circulation, angina, high blood pressure
- Stomach or intestinal disorder
- Sleeping difficulties
- Chronic chest disorders, especially if night time symptoms are troublesome
- Any medical condition requiring medication to a strict timetable
- Any aspect of your health which you think may be affected by night working

Yes No

Declaration by Night Worker:

I understand that I now have the option of being referred to Occupational Health for further assessment. This involves completion of a more detailed health assessment questionnaire that will be assessed by Occupational Health who will decide whether more information or a face to face consultation is required. Otherwise a decision on fitness for night work will be decided by review of the health assessment questionnaire. Detailed clinical information will not be disclosed to your employer without your consent. The result of the health assessment will be made available to your employer and will outline suitability to be assigned to or continue to do night work. In signing this health questionnaire, I confirm that all information provided is true and to the best of my knowledge.

I do/I do not* wish to exercise my right to a health assessment. *delete as appropriate

Signed:

Date:

8.3 Occupational Health night worker health assessment questionnaire

To the Manager/Supervisor

Manager/supervisor name:

Night worker details:

Name:

The job involves (please tick)

- Full time work
- Part time work
- Night time work only
- Working shifts between night and day work

The hazards of the job include (please tick)

- Manual handling
- Working at heights
- Working alone
- Driving
- Other (please specify)

Signed:

Date:

To the Night Worker

The purpose of this health assessment is to ensure that you are fit for night work. As a night worker you are entitled to a health assessment before you start working nights and at regular intervals while you continue to work nights. As part of this assessment, it may be recommended that you undergo a medical examination.

Personal and medical information about you;

- Will be retained by Occupational Health and treated confidentially
- Will be used to advise your employer if you are fit for night work, how your health could be affected by night work and if any workplace adjustments are needed.

Personal Details

Name:

Employee No:

Department:

DOB:

Telephone:

Details of your GP

Name:

Address:

Telephone:

Details of your treating consultant/specialist (if applicable)

Name:

Address:

Telephone:

I consent to the Occupational Health practitioner seeking a medical report or medical information from either/both of the above and I authorise the giving of such information for the purpose of this night worker health assessment.

Print Name:

Signed:

Date:

Health history (please complete the following)

Do you suffer from any of the following?

If an answer is Yes please give details.

	Yes	No	Details
Diabetes?			
Epilepsy, fits or blackouts?			
Disease of the heart or circulation, angina, high blood pressure?			
Stomach or intestinal disorder, ulcer?			
Any condition which causes difficulty sleeping?			
Chronic chest disorders, especially if night time symptoms are troublesome?			
Any medical condition requiring medication to a strict timetable?			
Are there any aspects of your health, which you think may be affected by night working?			

Declaration by Night Worker

In signing this health assessment questionnaire, you confirm that all information provided is true and to the best of your knowledge. Occupational Health fully complies with Data Protection Legislation and Medical Confidentiality Guidelines and in signing this you confirm that you have given explicit consent within the meaning of the Data Protection Act 1998 for Occupational Health to process your personal information with respect to your night worker health assessment.

Detailed clinical information will not be revealed to your employer without your consent. However we may make general recommendations based on the information you have provided e.g. medical condition well controlled on medication which should not affect suitability for night work.

Signed:

Date:

8.4 Occupational Health night worker assessment questionnaire review form

Private and Confidential

To:

From:

Date:

Name:

Employee No:

Department:

DOB:

Telephone:

I have reviewed the health assessment questionnaire of the above named night worker and am of the opinion that:

Employee is suitable for night work

Further information is needed and a GP report is recommended

Further information is needed and an appointment with an occupational physician is recommended

Medical condition controlled by appropriate medication and regularly monitored should not affect suitability for night work

Employee did not wish to avail of health assessment

Comments:

Signed:

Date:

9. Case Study

9.1 Case A

Company A is a medium sized biopharmaceutical. For production and customer requirements, the company operates a 24/7 twelve hour shift in part of the plant. The company changed its shift pattern recently and a number of benefits have been identified as a result.

9.1.1 Former shift

Until 2010, the company operated a forward rotating shift repeated every four weeks (see below). Sixty hours were worked the first week, with twenty four hours the following week, averaging forty two hours per week. According to employees the main advantage of the old system was that employees were off every second weekend.

However, it also required employees to work three consecutive nights over the period. Employees often felt very tired doing the third night and had only forty eight hours to recover before their next day shift. This led to occasional cognitive mistakes being made on the third night shift. Because of fatigue, employees would occasionally use either annual leave or sick leave to avoid working the third night or the first day back after this shift.

Neither was there a good balance of the number of shifts and hours worked in consecutive weeks with five shifts and sixty hours of work in the first week, followed by two shifts and twenty four hours of work in the second week, this number of hours was repeated in the third and fourth weeks.

Week one

Monday 7am–7pm Day
Tuesday 7am–7pm Day
Wednesday Off
Thursday Off
Friday 7pm–7am Night
Saturday 7pm–7am Night
Sunday 7pm–7am Night

Week two

Monday Off
Tuesday Off
Wednesday 7am–7pm Day
Thursday 7am–7pm Day
Friday Off
Saturday Off
Sunday Off

Week three

Monday 7pm–7am Night
Tuesday 7pm–7am Night
Wednesday Off
Thursday Off
Friday 7am–7pm Day
Saturday 7am–7pm Day
Sunday 7am–7pm Day

Week four

Monday Off
Tuesday Off
Wednesday 7pm–7am Night
Thursday 7pm–7am Night
Friday Off
Saturday Off
Sunday Off

9.1.2 Present shift

In 2010, the company changed to a new shift pattern outlined below. The company made this change for a number of reasons, including the following:

- Reports of fatigue from employees
- Reports of fatigue errors
- Advice from an occupational physician
- Review of illness and absence data
- Peer review of other companies shift patterns
- Production and customer requirements

The new system is a forward rotating shift pattern that is repeated every eight weeks:

- It involves 2 x12 hour day shifts followed by 2 x12 hour night shifts and then 4 consecutive days off
- Over the 8 week period, an average of 42 hours is worked per week
- There are 3 full weekends off over the 8 week period
- At least 1 weekend day is off every weekend except weekend 6

Week one

Monday 7am–7pm Day
Tuesday 7am–7pm Day
Wednesday 7pm–7am Night
Thursday 7pm–7am Night
Friday Off
Saturday Off
Sunday Off

Week two

Monday Off
Tuesday 7am–7pm Day
Wednesday 7am–7pm Day
Thursday 7pm–7am Night
Friday 7pm–7am Night
Saturday Off
Sunday Off

Week three

Monday Off
Tuesday Off
Wednesday 7am–7pm Day
Thursday 7am–7pm Day
Friday 7pm–7am Night
Saturday 7pm–7am Night
Sunday Off

Week four

Monday Off
Tuesday Off
Wednesday Off
Thursday 7am–7pm Day
Friday 7am–7pm Day
Saturday 7pm–7am Night
Sunday 7pm–7am Night

Week five

Monday Off
Tuesday Off
Wednesday Off
Thursday Off
Friday 7am–7pm Day
Saturday 7am–7pm Day
Sunday 7pm–7am Night

Week six

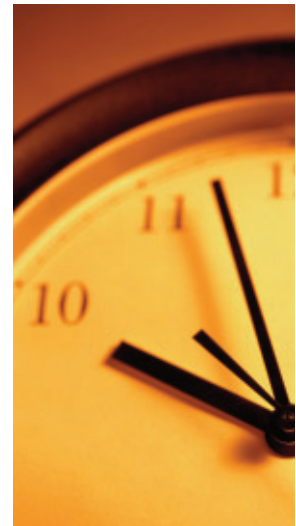
Monday 7pm–7am Night
Tuesday Off
Wednesday Off
Thursday Off
Friday Off
Saturday 7am–7pm Day
Sunday 7am–7pm Day

Week seven

Monday 7pm–7am Night
Tuesday 7pm–7am Night
Wednesday Off
Thursday Off
Friday Off
Saturday Off
Sunday 7am–7pm Day

Week eight

Monday 7am–7pm Day
Tuesday 7pm–7am Night
Wednesday 7pm–7am Night
Thursday Off
Friday Off
Saturday Off
Sunday Off



This shift has a number of advantages:

- Employees report being less fatigued than previously
- It involves only two night shifts in an eight day period
- There are four consecutive days off in each eight day period
- There are three full weekends off in each eight week period
- There is more time to recover
- The dreaded third night shift is gone
- There is less absence
- Employees make fewer errors caused by fatigue and are more productive
- Generally it is considered conducive to a good work-life balance
- Production and customer requirements are met

Employees doing this shift have access to the same facilities and opportunities as other employees. Training is carried out during their day shifts. The canteen is staffed at night time.

Before being assigned to night and shift work, the employee is required to meet the occupational nurse, who assesses his or her suitability for such work. Thereafter shift workers have an annual health check and as part of this they are asked specifically about the effects of night and shift work on their health. They can make an appointment with the nurse at any time. If an employee has a specific health problem relating to or exacerbated by night or shift work they are referred to an occupational physician.



10. Publications and Sources of Information

10.1 Publications

Managing Shift Work, Health and Safety Guidance, 2006

Health and Safety Executive, UK

Free download from www.hse.gov.uk

Human Factors Briefing Note No. 10 Fatigue

Health and Safety Executive, UK

Free download from www.hse.gov.uk

The Burden of Occupational Cancer in Great Britain, 2010

Health and Safety Executive, UK

Free download from www.hse.gov.uk

Rough Nights, the Growing Dangers of Working at Night, 2011

Will Norman, The Young Foundation

Free download from www.youngfoundation.org

10.2 Sources of information

10.2.1 Government bodies

Health and Safety Authority

Metropolitan Building

James Joyce Street

Dublin 1

Email: info@hsa.ie

Web: www.hsa.ie

Tel: 1890289389

National Employment Rights Authority

Government Buildings

O'Brien Road

Carlow

Email: info@employmentrights.ie

Web: www.employmentrights.ie

Tel: 1890 80 80 90

Department of Jobs, Enterprise and Innovation

23 Kildare Street

Dublin 2

Email: info@deti.ie

Web: www.djei.ie

Tel: 1890 220 222

10.2.2 Other organisations

European Foundation for the Improvement in Living and Working Conditions

Wyattville Road

Loughlinstown

Dublin 18

Email:

information@eurofound.europa.eu

Web: www.eurofound.europa.eu

Tel: 01 2043100

European Agency for Safety and Health at Work

Gran Via 33

E48009

Bilbao

Spain

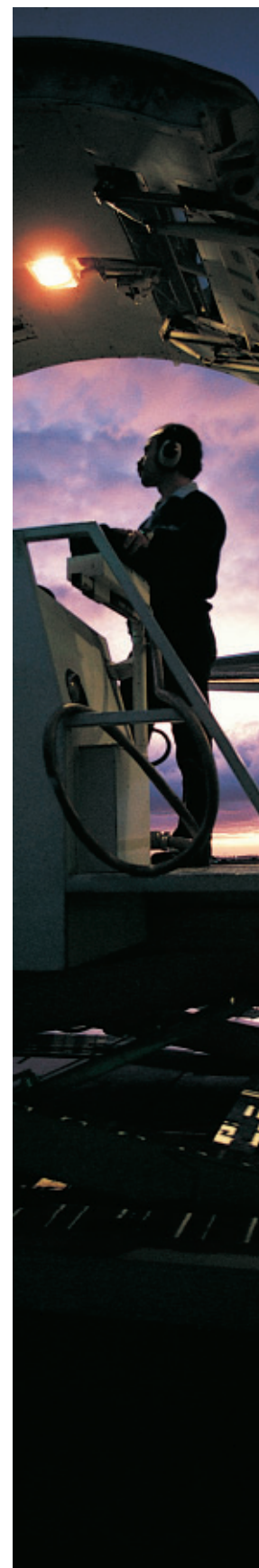
Email: information@osha.europa.eu

Web: www.osha.europa.eu

Tel: 00349 44794360

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