

Task

Fatigue from working patterns - Shiftwork and overtime



Fatigue refers to the issues that arise from excessive working time or poorly designed shift patterns. Fatigue is a perceived state of 'weariness' caused by prolonged or intensive exertion. It results in slower reactions, reduced ability to process information, memory lapses, absent-minded slips, 'losing the picture', lack of attention etc. Fatigue can lead to errors and accidents, ill-health and injury, and reduced productivity. It is often a root cause of major accidents.

What can cause fatigue?

The main factors are:

- Loss of sleep
 - 'acute', for example, having 3 hours less sleep than normal; or
 - 'cumulative' for example having 1 hour less sleep than normal over each of several days
- Poor quality sleep, lots of interruptions
- Having to work at a 'low point' in the day
 - e.g. early hours of the morning; mid to late afternoon and after a meal
- Long working hours, particularly if these are as long as 14 to 16 hours
- Poorly-designed shift work
- Inadequate breaks during the working day

Sleep apnoea is a sleep disorder characterized by pauses in breathing during sleep. Individuals with sleep apnoea are rarely aware of having difficulty breathing, even upon awakening and can become conditioned to the daytime sleepiness and fatigue associated with the resultant significant levels of sleep disturbance.

What are the main effects of fatigue?

Compared with their normal state, a fatigued person will:

- Find it hard to: concentrate, make clear decisions or take in and act on information
- Have more frequent lapses of attention or memory
- React more slowly (for example, to hazards arising in the workplace)
- Make more errors
- Occasionally fall asleep at work, momentarily or for several minutes
- Have little motivation or interest in their work
- Be irritable

Learning more about fatigue.

If the answer to any of the questions below is 'no', then you need to take action

Policy

Is there a policy that specifically addresses working hours and overtime and guards against fatigue?

- Does the policy demonstrate commitment to the management of this issue?
- Have front-line staff been involved in the development and review of the policy?
- Does the policy state how risks arising from fatigue related to hours of work and shift work should be assessed and controlled?
- Does the policy identify who it affects, and outline the responsibilities of management, supervisors and staff?
- Is there a periodic review and update of the policy?

Recognition

Has there been any consideration of hours of work and shift systems and their effect on staff?

- Did this specifically assess the risk of fatigue in safety critical staff and tasks?
- Is the review or risk assessment process repeated at specific intervals?
- Have the underlying causes of fatigue been examined?
- Is there an effective classification and recording system for working hours and the causes for exceeding the working policy?
- Have they identified what measures are effective for managing fatigue and which are not?
- Have employees been consulted in finding ways of avoiding and managing fatigue?

Control

Have the site set limits for the number of hours and the type of shift pattern?

- What are the consequences if these limits are exceeded?
- Are there arrangements for the maximum amount of agreed overtime?
- Is any overtime spread equally over all staff and shifts (and how do they know this)?
- Is shift swapping allowed and if so how is it monitored and controlled?
- Are the consequences of staff taking second jobs when off-shift considered and monitored?
- Has the opinion of the staff on the shift pattern been obtained?

Monitoring

- Is there a system of recording working hours, overtime, on-call working?
- Is there a robust, effective system for ensuring that the monitoring system triggers changes in staffing levels and workload should the need arise?
- Is the monitoring on an individual level?

Assessment

- Does the shift system conform to good practice ?
- Does the Fatigue Index Calculator (reference 5) indicate any shifts which carry fatigue risks of:
 - More than 25?
 - More than 30?

What can we do about it?

What should your company do about it?

Management and employees should be aware of some key facts about fatigue:

- Length of sleep - everyone needs about eight hours sleep per day
- Body clock ('circadian rhythms') - it's not good to be awake at night nor is it good to try to sleep in the daytime
 - Note: 'forward rotating' shifts (i.e. mornings to afternoons to nights) are better
- Errors - are more likely between midnight and 6am and between the 2nd and 4th hours of a shift (2pm to 4pm are also high points for error)
- Adaptation - it takes a few days to adapt to a new shift
- Effects of fatigue, e.g. reduced alertness, increased reaction time (effects are very similar to those of alcohol), memory problems and irritability
- Denial - people can find it difficult to realise or admit that they are fatigued
- Health - as well as safety can be affected by fatigue (e.g. digestive problems or, in the extreme, heart problems)
- Individual differences - the above affect different people in different ways.
- Persons with certain lifestyles or sedentary occupations may be at risk from sleep apnoea, and that the sleep disturbance it causes can cause fatigue.

What can managers do about it?

Management should assess and take steps to control all risks to the health and safety of their employees; this includes assessing working time arrangements.

Risk assessment should consider the following:

- Night working and changing from one shift to another(e.g. nights to days)
- Length of shift including any overtime
- Length and quality of rest breaks during the shift
- Rest breaks between shifts and the amount and quality of sleep taken
- Type of work - try to schedule safety critical tasks, tedious work or work that needs close concentration to avoid known high error periods
- Bio-rhythms (working with or against your 'body clock')
- The environment - mainly temperature and lighting – effect on drowsiness
- Individual preferences and suitability of certain people for shift work
- Training and raising awareness among shift workers, and their families, supervisors and managers on the signs and problems of fatigue and it's interaction with sleep patterns, nutrition and effects on social life
- Contingency plans if a crew member is absent (don't overload everyone else)
- Monitoring of employees for signs of fatigue, particularly on safety critical work
- Examining accidents and incidents for evidence of fatigue.
- Programmes that help employees to identify if they are at risk from sleep apnoea.

Some good practice guidance on shift roster design

Night shifts

- Restrict number of night shifts (to 4 maximum if possible).
- Allow at least 2 days off following night shift.
- Avoid keeping workers on permanent night shifts.

Early starts

- Delay early shift starts before 6am (e.g. 7am not 6am start).
- Limit the number of successive early starts i.e. before 7am (to 4 maximum if possible)
- Shifts involving an early start should be shorter in length to counter the impact of fatigue later in the shift.

Shift length

- If 12-hour shifts are worked then no overtime should be worked in addition.
- Avoid long working hours (more than 50 hours per week).
- If 8/10 hour shifts then no more than 4/2 hours additional overtime to be worked.
- Restrict 'back to backs' with 8 hour shifts and avoid entirely with 12 hour shifts.

Rest periods

- Allow minimum of 12 hours between shifts and avoid 'quick return' of 8 hours if possible. (Rest period between shifts should permit sufficient time for commuting, meals and sleep.)
- Plan some weekends off, advisably at least every 3 weeks.

Manage procedures

- Rotate shifts quickly (e.g. every 2-3 days). Avoid rotating shifts every 1-2 weeks.
- Use forward rotation (morning/afternoon/night) for preference.

Social considerations

- Arrange start/finish times of the shift to be convenient for public transport, social and domestic activities.
- Consider travelling time of workforce.
- Allow some individual choice where possible to accommodate larks/owls and family commitments.
- Keep the timing of shifts regular and predictable but also allow employees to have some flexibility to choose their own work schedule.

Useful Reference Information

1. Institute of Petroleum, Fatigue, Human Factors Briefing Notes No 5, 2003.
2. Health and Safety Executive, Fatigue, HSE Human Factors Briefing Note No 10.
3. Health and Safety Executive, HSE Human Factors Toolkit, June 2004.
4. Health and Safety Executive, Reducing Error and Influencing Behaviour, HSG48, 2007, HSE Books ISBN 978-0-7176-2452-2
5. HSE Contract Research Report 254/1999 Validation and development of a method for assessing the risks arising from mental fatigue HSE Books (2000) ISBN 0 7176 1728 9.

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