IPIECA

International Association of Oil & Gas Producers

Managing fatigue in the workplace

Shift work advice sheet

Health

THE GLOBAL OIL AND GAS INDUSTRY ASSOCIATION FOR ENVIRONMENTAL AND SOCIAL ISSUES

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Shift work advice sheet

The day to day effects of shift work, such as fatigue, are invariably short term and usually linked to specific phases of the work schedule, particularly night work. There is no evidence that shift work affects overall longevity but there are a number of conditions, particularly heart, circulatory and digestive disorders, that do appear to be associated with working shifts. This Advice Sheet will consider the effect of shift work on health and sleep and outline strategies for coping with the negative effects of shift work.

HOW DOES SHIFT WORK AFFECT US?

Shift work can affect us in several ways. While most early reports concentrated on physical well-being, more recent work has also examined the psychological and social effects.

Health effects

Heart Disease - Over the last few years, there have been a number of studies looking at shift work and cardiovascular disease. They have concluded that shift workers have a greater risk of cardiovascular disease compared with day workers although other established risk factors, such as body weight, blood pressure, and smoking are also likely to be important.

Overall, around 5% of the population have heart disease and about 25% of men are at increased risk of the condition. If you have heart disease, your fitness to work shifts will depend on many factors, including the safety criticality of the role, and needs to be considered carefully following discussion with Occupational Health.

Disorders of the digestive system – whilst digestive disorders are very common in the general population, they are more common in shift workers than day workers. Common complaints are pain and changes in bowel habits, especially constipation and diarrhoea, and are most often associated with night work. Peptic ulcers, however, are the most significant disorder associated with shift work. The causes are likely to be multiple but diet, smoking, alcohol consumption, and irregular mealtimes are all likely to be factors. With modern drug therapy, the presence of peptic ulceration should not exclude you from shift work.

Diabetes – only a few studies have examined the incidence of diabetes in relation to shift work. Although more shift workers suffer from the condition than the general population and the number increases with increasing time on shifts, there is little evidence that shift work is itself a risk factor for diabetes.

The overall prevalence of insulin-dependent diabetes in the UK is around 3.5 in every 1000 persons and that of non-insulin dependent diabetes is between 2 and 4 in every 100. There is no reason why a motivated and well-controlled diabetic should not undertake shift work and insulin treated diabetics who work shifts have similar levels of control to non-insulin treated diabetics.

Neurological disorders – epilepsy occurs in around 5-10 in every 1000 persons and many people with well-controlled epilepsy work rotating shift patterns without problems. Although in general there is no reason why epileptics should not undertake shift work, sleep deprivation may trigger seizures in some individuals and such persons will need to be monitored closely.

Respiratory disorders – asthma affects about 5% of the adult population. Although a few asthmatics may have difficulty establishing control of their symptoms with rapidly changing shifts, in general, shift work should not be a problem.

Mental health – shift work can be a factor in certain mental health problems and needs to be considered individually.

Pregnancy – there is evidence of an association between shift work and pregnancy outcome in terms of miscarriage, low birth weight and premature birth. It is therefore most important to ensure that work does not present any adverse risk to the pregnancy.

Medication – drugs that cause drowsiness or affect performance may add to the sleepiness and impaired performance associated with shift work. Also because of the different times of sleep and wakefulness during the shift cycle, some individuals may require manipulation of their dosage schedule. It is important that there is good communication between Occupational Health and your general practitioner to ensure that any drug regime is suited both to you individually and the shift pattern worked.

Efficiency, performance and safety

Efficiency – the disruption of the body's natural rhythms, combined with inadequate sleep and developing fatigue will lead inevitably to reduced efficiency, particularly in the early hours of the morning for those on the night shift. For the morning shift, the shortening of the sleep period caused by an early start at work is itself associated with an increase in errors and accidents and finally for the afternoon shift, the tiredness that we all experience in the mid-afternoon results in lowered efficiencies and performance.

In general, people who are tired work more slowly, less effectively and make more mistakes. Indeed, President Bill Clinton, in an interview with US News and World Report in April 1993, went as far as to say: "Every major error I made in my life, I made when I was tired".

Performance and safety – the performance reductions and sleepiness associated with sleep loss and disruption of the body's natural rhythms can lead to incidents and accidents. A number, including the grounding of the Exxon Valdez, the Three Mile Island and Chernobyl nuclear accidents, and the Space Shuttle Challenger explosion, have all featured prominently in the media over the years. Safety risks have been found in every mode of transportation and most shift work settings have identified incidents and accidents due to fatigue. Indeed, in a study of over 500 daytime industrial plant workers, those with complaints of excessive sleepiness had a greater than two-fold higher risk of sustaining an occupational injury.

Physical well-being

Under normal conditions, our physiological functions show rhythmic changes over the course of the 24 hour day. Because the normal human being is awake during the daylight hours, such rhythms often peak in the daytime and dip during the night. Body temperature and blood pressure are good examples of this. However, other rhythms such as production of the hormone cortisol do the opposite and tend to peak at night. These rhythms are not merely a response to living in a rhythmic world but are regulated by our own internal biological clock located deep in the brain which governs every aspect of our functioning on a 24-hour basis.

This clock synchronises our internal systems including the sleep-wake cycle, our level of alertness, performance, mood, hormone production, digestion and body temperature. Using light is one of its primary cues, the clock is extremely sensitive and ensures that our internal systems function smoothly and are synchronised both with each other and with the external world.

The change from day to evening and night work means that we have to modify our normal cycle of activity and rest. However, adjusting our body rhythms is more difficult and complete adjustment is seldom reached except in a small minority of permanent night workers. Consequently, shift workers often suffer from feelings of fatigue, sleepiness, insomnia, disorientation, digestive problems, irritability, poor mental agility and reduced performance efficiency.

This impacts on almost every aspect of our activity and may result in reduced judgement and decision-making capabilities, such that crucial decision factors may be overlooked and poor choices made. Other effects include diminished communication skills, memory and finally reduced attention such that important cues may be missed.

Sleep and sleepiness

Our alertness, performance and body metabolism all peak in the late afternoon and reach a low point in the early hours of the morning. Shift workers invariably report more sleep disturbances than day workers, although the effects depend on the shift timing:

Morning work – the sleep before a morning shift may be disturbed for a number of reasons. Firstly, it is difficult to go to bed more than about an hour before your normal bedtime as your body will not be ready for sleep and secondly, when you know you have to get up early, you will be anxious about oversleeping and therefore will not sleep as well. As a result, you may not be fully rested when you wake and may feel sleepy during the day leading in turn to an afternoon nap when the shift is over.

Afternoon work – on the whole, individuals working afternoon shifts adopt a pattern of slightly later bed times.

Night work – is characterised by feelings of sleepiness. The effects are particularly severe in the early morning and may result in unplanned napping. Day sleep after night work is often short and may be supplemented by an afternoon nap. During days off, some sleepiness may remain and it can often take two nights of sleep before normal levels are re-established. This increased sleepiness will of course, make the individual more vulnerable to accidents.

The other reason for night shift sleepiness is that the time you are awake before the end of a night shift may be as much as 20 or 22 hours compared to 10 or 11 hours for a day worker. Our alertness begins to decrease immediately after the end of sleep and continues to reduce further for the whole time we are awake. If you add to this a shortened daytime sleep following your previous night shift it is clear that the increase in sleepiness will continue to accumulate over successive shifts.

Social impact

It is estimated that about one in five workers leave shift work because they can't tolerate it, whilst another one in ten enjoy it. The rest simply accept it. Which of these groups you fall into will depend partly on your personality and partly on individual physical factors.

Age - is important as our sleep patterns change as we get older making it less easy for us to tolerate shift work. Although experienced shift workers usually cope very well, it is probably inadvisable to begin shift work at an older age.

Family and social life – shift workers sometimes experience disruption to their family and social activities because of evening and weekend working. However, as with most things there may be compensatory advantages with days off during the week which may give you greater opportunities to pursue your hobbies.

HOW CAN I COPE WITH THE EFFECTS OF SHIFT WORK?

There are many old wives' tales about coping with tiredness and whilst some do have a sound foundation, others do not. All, however, are potentially dangerous, and should not be relied upon as one of your strategies for dealing with shift work.

This Advice Sheet will discuss a number of commonly used approaches. Some are not supported by scientific data demonstrating effectiveness, and others may themselves cause health problems. Some in fact have little or no impact on fatigue at all, even though people think they do, and these can be especially dangerous since a drowsy individual may believe they are alert when in fact they are not.

Nicotine

Nicotine is a stimulant that has effects on performance and mood similar to that of caffeine; that is, it enhances alertness for a period of time following consumption.

However, the adverse health effects of nicotine, especially from tobacco use, far outweigh the small alerting effects obtained. Additionally, nicotine will reduce the quality of sleep if it is consumed within a few hours of bedtime. Avoid it!

Ventilation and temperature

Altering the airflow and temperature in the surrounding environment is often fairly easy. Whilst there may be some effect after lowering the surrounding temperature or increasing air flow, research suggests that the impact is very short lived and not likely to increase alertness for longer than a few moments. So, if you are feeling sleepy, it is best to use another strategy. Don't use it!

Exercise

There is good evidence that if you are physically fit you will be able to cope better with shift work than if you are unfit. In addition, exercise will help to improve your sleep and you will tend to fall asleep more quickly and sleep more soundly. However, exercise does not allow you to cut back on the amount of sleep you need and although it can reduce the immediate feelings of fatigue, the effect only lasts for about 30 minutes and job performance does not improve. As a result, although you may feel better after exercising during a sleepy period on the job, you are still fatigued and should be aware that your performance is likely to be reduced. Likewise, don't exercise too close to bedtime as it will delay your ability to go to sleep. Exercise regularly!

Diet

There would be enormous advantages to a food-based strategy for overcoming tiredness if it actually worked. However, current research suggests that specific food content has little, if any impact on your level of alertness or feelings of sleepiness. The sleepy feelings that follow a large meal are more likely the result of overeating rather than the effect of the nutritional composition of the meal. **Don't try it.**

Sound

Turning on the radio when you are working is a simple way to change what may be a monotonous environment, and the change may reduce your fatigue or prevent you from falling asleep for a brief period of time. However, if you are already sleepy, it may have little, if any effect and although sound may seem to reduce fatigue, your performance will continue to deteriorate. The best use of sound is to 'keep you company' while you quickly arrange to take a break – **it is not a substitute for sleep.**

Smell

The use of aromatherapy with peppermint or lavender to stimulate alertness or promote sleep is gaining popular support. However, using a strategy that does not work is probably worse than not using one at all. People in aromatherapy studies tend to rate themselves as more alert after being exposed to an aroma, but in fact their performance does not change. There is no scientific evidence that administering a fragrance will enhance alertness, increase performance, or promote sleep. **Don't use it.**

Over-the-counter medicines

There are many over-the-counter medicines that contain ingredients which may be sedating. Such ingredients include anti-histamines, which are normally used to treat allergies. However, the immediate and longer-term hang-over effects may be unpredictable and such medicines should be avoided. Speak to the pharmacist before buying any over-the-counter drugs. **Be an informed consumer.**

IPIECA

IPIECA is the global oil and gas industry association for environmental and social issues. It develops, shares and promotes good practices and knowledge to help the industry improve its environmental and social performance, and is the industry's principal channel of communication with the United Nations.

Through its member-led working groups and executive leadership, IPIECA brings together the collective expertise of oil and gas companies and associations. Its unique position within the industry enables its members to respond effectively to key environmental and social issues.

IOGP represents the upstream oil and gas industry before international organizations including the International Maritime Organization, the United Nations Environment Programme (UNEP) Regional Seas Conventions and other groups under the UN umbrella. At the regional level, IOGP is the industry representative to the European Commission and Parliament and the OSPAR Commission for the North East Atlantic. Equally important is IOGP's role in promulgating best practices, particularly in the areas of health, safety, the environment and social responsibility.

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