

Wake up to fatigue risk management

Feeling fatigued is an everyday experience. Everyone can recognise the symptoms – lethargy, inability to concentrate, slow reaction times, feeling irritable. Fatigued individuals may even have a good idea why they feel this way – long hours, lack of sleep, that hay fever medicine they took earlier, or because what they are doing requires intense concentration. There may even be a combination of causes. The question is, what can be done to reduce fatigue/increase alertness?

Both of the following articles report work carried out in the EI's Technical Programme using Technical Partner funding and Health and Safety Executive (HSE) co-funding. The first provides an overview of a new publication that provides guidance on managing fatigue; whereas the second article describes, in detail, one emerging measure.

A guide to improving alertness through effective management of fatigue

Bill Gall, *Human Factors Consultant, Kingsley*

Management Services, reviews the origin and content of a new IP publication on improving alertness through effective fatigue management.*

Industry and the UK HSE regard fatigue as very much a key human factors issue. In their inspections and investigations, HSE inspectors have identified fatigue as a common problem – not least because it regularly features in accident or incident reports, very often as a contributory factor rather than a primary cause. Their particular concern is that fatigue typically stems from poorly-designed and managed shift-working arrangements. They believe that the effects described above, and others, encourage errors and those errors, in turn, can lead to accidents.

HSE has developed health and safety guidance for managing shiftwork across all industry sectors (publication pending) and, as a supplement to this, the EI's Human Factors Working Group commissioned Kingsley Management Services to develop a complementary

publication for the petroleum and allied industries, entitled *IP Improving alertness through effective fatigue management*.

Origin of the publication

To develop the EI publication, the most relevant research reports, incident investigations, existing guidance, conference papers and case studies were consulted. However, fatigue remains a difficult and contentious area. Paring the information down to its bare essentials with information relevant to the petroleum and allied industries, and excluding anything controversial – including anomalies in or contradictions between the source material, 'myths' and unsubstantiated 'findings' – was a challenge.

Key to meeting this challenge was to invite input, but also criticism, from a

wide forum of industry representatives and from other experts in the field. The resulting publication contains a distillation of the essential information required to understand the primary causes of fatigue and it provides summaries, overviews and practical methods for identifying and reducing the incidence of fatigue.

Overview of the publication

The publication is divided into four main sections.

A general introduction describing – using case studies and research findings – the problem of fatigue and how it manifests itself in health and safety consequences. It includes definitions of fatigue and describes the overall structure and purpose of the publication.

Section 2 describes factors that need to be controlled in order to reduce fatigue/increase alertness. Factors include hours of work, rest periods within and between shifts, shift patterns, working conditions and work content. There are two short sub-sections concerning fatigue and alertness issues relevant to offshore working and distribution dri-

ving – working arrangements and some of the rules that apply for these sectors differ from the rest of the industry.

Section 3 centres on a simple graphic to illustrate risk assessment and incident investigation methods with reference to a marine industry case study. These methods are fundamental to addressing alertness issues and are shown to be two sides of the same coin, one approaching risk control by examining what happened in an incident and working back to the hazard as a means of assessing system failings that contributed to the hazard exposure. The other method by identifying hazards and 'barriers' required to maintain control; in this case, the methods focus on crew alertness as one of those barriers.

Section 4 summarises the preceding sections and describes practical solutions that have been used successfully to reduce the risk of fatigue. Pros and cons of each method are set out and pitfalls in data gathering are described. Solutions include methods for gathering and assessing information on fatigue problems and methods for

dealing with those problems. Data gathering methods include checklists and suggested questionnaire items. Solutions are concerned with improving work and break scheduling; the job environment (the type of work and conditions that may affect alertness); and staff support – ensuring that the workforce is properly supported by management and family members. One novel and very promising potential solution has been identified and is the subject of a related report – 'sleep contracts' (see following article).

IP Improving alertness through effective fatigue management also covers the need for workforce and management 'education' on alertness and fatigue; the effects on alertness of ageing and exercise; and how to implement fatigue reduction initiatives and measure their outcome using procedures based on change management principles.

The publication contains many useful references and website links and, for those curious to know more about the underlying research, there is an annex describing its primary sources of information.

Find out more

IP Improving alertness through effective fatigue management, ISBN 0 978 85293 460 9, will be freely available from the EI's fatigue web page at www.energyinst.org.uk/humanfactors/fatigue. Hard copies can be ordered from www.energyinstpubs.org.uk. For intranet copies, contact e: pubs@energyinst.org.uk

The EI Human Factors Working Group welcomes feedback on the publication and useful case studies – problems experienced, solutions tried (whether they worked or not). Where appropriate, they could be posted on the website for the benefit of others seeking information on this subject, possibly in the form of an IP Human factors safety information bulletin. Send details to e: technical@energyinst.org.uk

**Kingsley Management is a human factors consultancy specialising in human reliability analysis and the development of human factors guidance, including the IP Human factors briefing notes and HSE COMAH guidance material.*

The role of sleep contracts in managing fatigue risk

Dr Alexandra Holmes, *Research Director – Clockwork*

*Consultants, * describes the findings of a new IP Research*

Report that explores the possibilities offered by sleep contracts as a tool in managing fatigue risk.

Regulators and industry are increasingly recognising fatigue as a safety hazard, and that the defences typically used against this hazard do not ipso facto provide adequate control for employees or employers. The most widely used control strategy is prescriptive limitations on hours of work (HoW), for example the EU Drivers' Hours Rules. Whilst of undoubted value, HoW restrictions cannot provide comprehensive protection because they are generally based on broad assumptions and predictions about how much fatigue will accumulate, or be experienced by employees when working a particular schedule. HoW restrictions are not usually scientifically defensible and ignore the variation in fatigue risk that occurs across 24 hours, between individuals, across seasons and with different work tasks.

Recognising the need for further guidance and tools for managing

fatigue risk, the Energy Institute's Human Factors Working Group sought further information on an emerging Australian strategy known as a 'sleep contract'. The Working Group commissioned Clockwork Consultants Ltd to identify companies from the petroleum and allied industries were utilising a sleep contract. Stakeholders from the companies were interviewed to ascertain their experiences and to report on whether a sleep contract could be a useful fatigue risk management tool.

What is a sleep contract?

The first step of the study was to define the term 'sleep contract'. Although an existing definition of the term could not be identified a number of the companies interviewed were using a process for managing fatigue that shared common elements (see Box 1). These elements were used to inform

the following operational definition of a sleep contract (Box 2).

Benefits of a sleep contract

The stakeholders consistently reported that the addition of a sleep contract to their safety management system (SMS) had been a positive step. The reported primary benefits of a sleep contract were that it enables the organisation to know and address 'actual' or day-to-day fatigue risk.

When an individual reports fatigue to their immediate supervisor, a sleep contract would require that both parties respond to the case in a formal, structured manner and manage the immediate and long-term risk. For example, the sleep contract could require that the employee is provided with an opportunity and suitable environment to obtain a nap; the source of fatigue (if known) is discussed; and both parties commit to a course of action that should address the associated risk for the remainder of the shift and – where relevant – on an ongoing basis. Where the source of fatigue is operational in origin, for example, rostered work hours, the organisation is obliged to address this risk.

The data collected via a sleep contract can be utilised to track trends in fatigue and to identify potential sources. For example, a sleep contract may highlight specific shifts, crews, or times of day when fatigue is repeatedly reported. In turn, this information can

Box 1: Case study – using sleep contract concepts

In 1996, Nolan's Interstate Transport of Queensland, Australia, specifically incorporated fatigue into their safety management system. Although the system does not include a sleep contract, by that name, it contains many of the key components of such a contract, including:

- a set of standards regarding how much sleep an employee must obtain prior to attending work;
- a statement of the employees' responsibility to inform management when the standards are breached or they experience fatigue;
- when an employee reports fatigue they are not required to work and a 'management system which manages the likely causes of fatigue' is activated;
- no financial or other sanctions for reporting fatigue;
- counselling is provided where appropriate; and
- instances where employees report being unfit for duty due to fatigue are recorded in a database and the data are evaluated periodically to inform management in how fatigue risk can be further reduced.

Nolan's employs approximately 200 drivers and in a six-month period four drivers had informed the company that they were unfit to work due to fatigue.

Box 2: Defining a sleep contract

A sleep contract can be defined as: 'a negotiated and agreed framework for managing fatigue on a day-to-day basis that is integrated into an organisation's existing safety management system. The framework is formally documented and makes it clear that employees and management are jointly responsible for the management of fatigue risk and states the responsibilities/accountabilities of each party.'

Box 3: Essential components of an effective sleep contract

- management commitment/support;
- based within an existing safety management system;
- a definition of what constitutes being 'too tired for duty' and how the employee and employer will respond when fatigue is reported;
- training for employees to help them recognise and manage their fatigue;
- requirement for an employee who is not fit for work due to fatigue (either before work or during work) to inform his/her immediate supervisor or manager;
- company support for employees reporting fatigue and consideration of reasons why employees may be reluctant to report fatigue;
- requirement for a supervisor to address the employee's reported fatigue in a formal manner utilising the potential actions/outcomes that are included in the 'contract'; and
- recording and periodic analysis of fatigue events, and how they are managed, to enable fatigue 'hot spots' to be identified.

be used to refine the fatigue controls in place within the organisation.

What constitutes an effective sleep contract?

For a sleep contract to be effective, the content should be agreed via a process of consultation and negotiation between employees, management and safety professional – essential compo-

nents are provided in Box 3.

The success of a sleep contract is also dependent on a number of pre-conditions, including existing mutual support between employees and management. If a supportive work culture exists then a sleep contract is more likely to be perceived as an operational tool that has been developed to jointly assist man-

agers and employees, rather than as a disciplinary tool or a mechanism for management to avoid their responsibility regarding fatigue.

A sleep contract will also only be effective if employees are honest about their tiredness. For this to be a reality the purpose of the sleep contract needs to be clearly communicated and its structure should be negotiated and agreed. If employees are to be expected to use the contract the company needs to ensure that, when an employee reports fatigue with a valid reason, they are not penalised, either explicitly (eg via disciplinary procedures) or implicitly (eg via the attitudes of more senior members of staff). It should also provide access to the appropriate support, such as an employee assistance programme.

Conclusions

The concept of a sleep contract has evolved as a necessary complement to HoW limitations. By offering a process for determining actual day-to-day occurrences of fatigue, the implementation of a sleep contract can provide an organisation with a more realistic indicator of fatigue risk. This information, in turn, can be utilised to make informed decisions about fatigue risk management.

Find out more

IP Research Report: Viability of using sleep contracts as a control measure in fatigue management, ISBN 978 0 85293 455 5, is freely available from the EI's fatigue web page at www.energyinst.org.uk/humanfactors/fatigue Hard copies can be ordered from www.energyinstpubs.org.uk For intranet copies contact e: pubs@energyinst.org.uk In addition, an IP Human factors safety information bulletin on sleep contracts has been added to the established series; this also can be accessed from the fatigue web page at www.energyinst.org.uk/humanfactors/fatigue

*Clockwork is an independent consultancy providing research, policy and training services to companies seeking to manage the fatigue risk associated with their operations. For more details visit www.clockworkconsultants.com

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