

Safety management system for managing fatigue

Tuesday, 16 May, 2006

By Maria Karlsson, OHS editor for CCH

At the Human Factors conference, Dr Drew Dawson, Executive Director of the Centre for Sleep Research at the University of South Australia, reported that he has taken the approach used to develop safety management systems and applied it to fatigue management.

Fatigue is now getting more attention as a workplace hazard than it used to. Courts are also taking fatigue seriously, as indicated by a recent fine of \$130,000 imposed on a company over a safety breach involving a fatigued truck driver. The principles of the regulations on fatigue management incorporated into the Occupational Health and Safety Regulation 2001 (NSW) from 1 March 2006 will flow on to the other jurisdictions (except Western Australia, where fatigue management for commercial vehicle drivers has already been covered by a code of practice since 2004).

The recent key shift in relation to fatigue is that it is now managed as an occupational health and safety problem rather than an industrial relations problem. In the past, danger money was paid in many jobs that involved working while fatigued. Trying to manage fatigue within the industrial relations sphere was a spectacular failure, Dr Dawson said, and a parliamentary inquiry into the problem in 1999-2000 made three recommendations:

- (1) There needs to be a shared responsibility for fatigue between employers and employees.
- (2) Fatigue management in high-risk industries (e.g. mining and transport) should be developed according to a risk-based framework, such as that presented in Australian standard AS 4360.
- (3) Fatigue should be dealt with as just another part of the safety management system.

Management plan

There are four key steps to take in the risk management of fatigue:

- (1) Develop a fatigue management plan.
- (2) Work out how to communicate the plan and educate people about it.
- (3) Develop an auditable method to ensure safe levels of alertness can be maintained.
- (4) Carry out audits to ensure compliance with the plan.

Fundamental elements of the fatigue management plan are that it must prevent excessive wakefulness and provide adequate sleep opportunity. It is the employees' responsibility to make use of the provided sleep opportunities to actually sleep and, if an employee in a high-risk job has not had enough sleep, the person may need to inform the employer. Management needs to provide guidelines on how to manage insufficient sleep because of the hazards that arise from that. Dr Dawson made the point that if employees fail to notify the employer of their lack of sleep and an incident occurs, interesting legal ramifications may arise.

Educating employees about fatigue management should be in the form of competency-based training. There are auditable methods of training people to make sure they know about fitness for work.

A multi-layered control system

Dr Dawson also emphasised that a multi-layered defence system is needed for fatigue management. People tend to go overboard trying to find an effective control method, but a single control cannot be expected to be adequate — there is no single foolproof way of ensuring workers are not too fatigued to perform their work safely. Multi-layered systems (use of training as well as equipment, PPE, etc as applicable) on the other hand can tolerate mistakes or omissions in one or a few of the defence levels while remaining effective overall.

Four potentially causally-based events may precede a fatigue-related incident. Each needs to be addressed and controlled. To investigate them, ask the following questions:

- (1) Had the person been given an adequate sleep opportunity?
- (2) Had the person taken the opportunity and had adequate sleep?
- (3) Had the person displayed some recognisable fatigue behaviour before the incident?
- (4) Had the person made some fatigue-related error?

In a model that Dr Dawson published last year (*Sleep Medicine Reviews* 9, 365-380, 2005), he presented five levels of control for a sleep management system. Errors that occur in the top three levels are latent, whereas errors in the last two levels are active errors.

Level 1 controls involve determining the average sleep history of a work group (not an individual). Assess their sleep opportunities according to hours worked per seven days, shift duration (longer shifts, less opportunity for sleep), duration of short breaks, the number of hours of night work per seven days, and the duration of long breaks per seven days. As all of these factors increase, the likelihood of sleep is reduced (e.g. a person who works 55 hours a week is likely to get less sleep than a person who works 38 hours a week). According to this assessment, the 38-hour pattern of working Monday to Friday is the norm. Other shifts tend to increase workers' likelihood of getting less sleep.

Level 2 controls involve calculating individual fatigue likelihood scores. First estimate the person's hours of sleep in the past 24 hours, and then in the previous 48 hours. Then ask how long the person has been awake. The reliability of the personal fatigue score has been confirmed scientifically. However, Dr Dawson pointed out that it remains a statistical assessment and of course does not guarantee that a person with a certain score will have an accident.

Calculating the personal fatigue score can be done, for example, at toolbox meetings. If risk-based categories of work have been established at the workplace (low-risk jobs and high-risk jobs), the score can be used to determine what tasks are given to individual people to do.

Level 3 controls involve identifying behavioural indicators for specific tasks, such as operating particular equipment. The behaviour indicators include physical, mental and emotional symptoms and the physical ones include task-specific behaviours. Procedures for managing impaired people need to be developed.

Level 4 and 5 controls involve identifying errors and incidents. You need proof of level 1-3 indicators of fatigue. The nature of the error must be consistent with fatigue-related errors (rather than other errors). Confusing incidents with causation is a common mistake.

Each level of control works as an integrated whole. If you can reduce fatigue by levels 1 or 2, you will fairly effectively have reduced the likelihood of an incident occurring. Dr Dawson recommends managing the first two levels rather levels 4 or 5.