

## Fatigue and Fitness for Work

### Position Statement

The AIHS recognises that fatigue, arising from within or external to the workplace or job, may cause human errors that can result in fatalities, injuries or property damage. Organisations need to recognise the adverse consequences resulting from fatigue as a hazard in their workforce, consistent with the requirements of work health and safety and other legislation, and have appropriate methodologies in place to assess the potential for harm and to control for adverse consequences. Occupational Health & Safety Professionals (OHSPs) need to keep updated on current advances in the theory and practice of fatigue management, including the use of technology to plan work and assess fitness for work, and to be able to assist implementation of fatigue management systems as appropriate to their organisations.

### Rationale

#### 1. Legislation

The general duty of care, covered within work health and safety legislation<sup>1</sup>, requires the employer or persons conducting a business or undertaking to ensure, so far as reasonably practicable, that employees are not exposed to harm from hazards within their workplace. The case for recognising fatigue as such a hazard is discussed below, so that organisations are required to assess risk of fatigue and to put appropriate control measures in place consistent with duties under the hierarchy of control<sup>2</sup>.

Regulations, generally outside the work health and safety legislation relating to fatigue apply in certain industries, e.g. heavy truck, rail and air transport and mining. The rest of industry and commerce are covered by the general duties in the Work Health & Safety Acts. A guide has been developed by Safe Work Australia (2013) for managing the risks of fatigue at work, and adopted by jurisdictions using the model legislation. However, it is argued that the risks of adverse outcomes from fatigue are reasonably foreseeable as there is a wide range literature covering fatigue and adverse outcomes in a range of industries, as well as government guides. Accordingly, regardless of a lack of regulation on fatigue in most industries, organisations, their officers, and workers are at risk if organisations do not have appropriate systems to assess and control fatigue risk.

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<sup>1</sup> Eg see s19 *Work Health and Safety Act* in jurisdictions that have adopted the model legislation, S21 of the *Occupational Health & safety Act 2004 (Vic)* and s19 of the *Occupational Health and Safety Act 1984 (WA)*.

<sup>2</sup> Eg see s17 *Work Health and Safety Act* in jurisdictions that have adopted the model legislation, S20 of the *Occupational Health & safety Act 2004 (Vic)* and s19 of the *Occupational Health and Safety Act 1984 (WA)*.

## 2. Literature

A good overview of the hazards posed by fatigue is provided the OHS Body of Knowledge, Ch 20, Fatigue<sup>3</sup> that includes implication for OHS practice. This policy summarises that chapter and updates the situation with current information.

### 2.1 Hazard Identification

In *J Roussety v Castricum Brothers Pty Ltd [2016] VSC 466*, the Court held that a 'reasonable person' would have taken steps to minimise the reasonably foreseeable risk of Roussety developing a psychiatric illness after collapsing due to his workload including:

1. Modify his workload;
2. Reduce or remove his on-call duties;
3. Monitor the hours he was required to work;
4. Increase the staff at the plant; and
5. Provide him with support and direct that he take any sick leave he required or time off work if he had worked particularly long hours.

Most of these are good human resources practice, and fatigue management can be said to be exactly that.

Many studies have clearly shown an association between increasing fatigue and decrements in cognitive function, impaired performance, increasing error rates, and ultimately, reduced safety. Accordingly, governments and OHSPs have argued that fatigue is an identifiable work place hazard that warrants regulatory attention (Dawson and McCulloch, 2005).

Fatigue can be both physical and mental, and arises from a lack of sufficient and appropriate sleep. This can arise from factors within or outside the workplace and can include:

- Excessive work hours, including juggling two jobs,
- Insufficient time between work shifts to obtain sufficient sleep
- Evening and night shifts that results in poor sleep patterns during the day
- Sleep disorders, inappropriate diets and eating patterns
- Domestic issues disturbing sleep patterns, e.g. noisy and uncomfortable home environments, sick children.

Some of the above items are directly controlled by the workplace (e.g. shift rosters, breaks, etc.), and some are not in the direct control of the organisation. However, a fatigued worker within an ideally designed roster can still cause damage, injury and fatalities. Employers need to understand that workers have to be fit for duty, so need to have appropriate systems in place to control for this. While shift work, particularly night shift, cannot be eliminated where 24/7 coverage is required, it has to be recognised that staying alert when the circadian body clock

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<sup>3</sup> Paterson J and Dawson D, 2012, Psychosocial Hazards: Fatigue, SIA Body of Knowledge

cries for sleep is contradictory. This is a situation where the hazard cannot be eliminated, so must be mitigated. This is discussed below.

Dawson and Reid (1997) identified that being awake for 18 hours caused a reduction in cognitive impairment equivalent to the impairment associated with having a blood alcohol level of 0.05%. In *Easterman v Namoi Cotton Co-op Ltd* [2014] NSWCC 465, it was found that fatigue following 5 x 12hr nightshifts resulted in Zara Easterman falling asleep at the wheel while driving to her 6<sup>th</sup> shift, drifting into the oncoming traffic and into the path of a truck and died. Her commute to and from work was 37 minutes. The judge found that fatigue arose out of or in the course of employment and contributed to the death. \$498,950 was awarded to the estate in workers' compensation payment.

Moreover, it is noted that it is not just blue collar workers that suffer from fatigue. Professionals such as medical staff, lawyers and others have similar issues with hours of work, and are at high risk during the shift (eg surgeons), or driving home. In addition sleep-deprived people perform badly on all aspects of creative thinking.

## 2.2 Risk Assessment

Fatigue, as well as other hazards such as medication or drugs and alcohol can affect a worker's fitness for duty by reducing alertness and decision-making powers that in turn can impair judgement and result in accidents. There is a large range of procedures and technology available to assess a worker's fitness for work. This field is growing, and a selection of techniques is provided to initiate understanding of what is available:

- Assessing how much sleep a worker has had in the past 24 and 48 hours gives a good estimate of the fatigue risk (Dawson and McCulloch, 2005). This can be assessed at the start of shift with a questionnaire or inputting the numbers into a simple app<sup>4</sup>.
- A range of devices are available to test vigilance at the start of shift. Examples include OSPAT (Pettrilli *et al*, 2005), and PMI Fit 2000 (Russo *et al*, 2003).
- A range of devices are available to test vigilance in real time and have been adopted in transport and mining. Examples include Optalert (Anderson *et al*, 2013), and Smartcap (Abbood *et al*, 2014).

Dawson *et al*, 2014, provide a useful assessment on the different technologies although it must be remembered that this field is far from static. However, whatever the approach used, the objective is to assess the risk posed by fatigue to health and safety. The employer can then make decisions on how to control for such risk.

It should be noted that the devices testing for vigilance noted above are testing for this outcome from any cause, including health issues, drugs and alcohol. As such it can form a testing process for drugs and alcohol in the workplace. However this will not be sufficient if there is a mandated

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<sup>4</sup> See <http://www.vgate.net.au/fatigue.php>

requirement for explicit drugs and alcohol testing in either regulations for specific industries or jobs, or in industrial agreements.

### 2.3 Risk Control

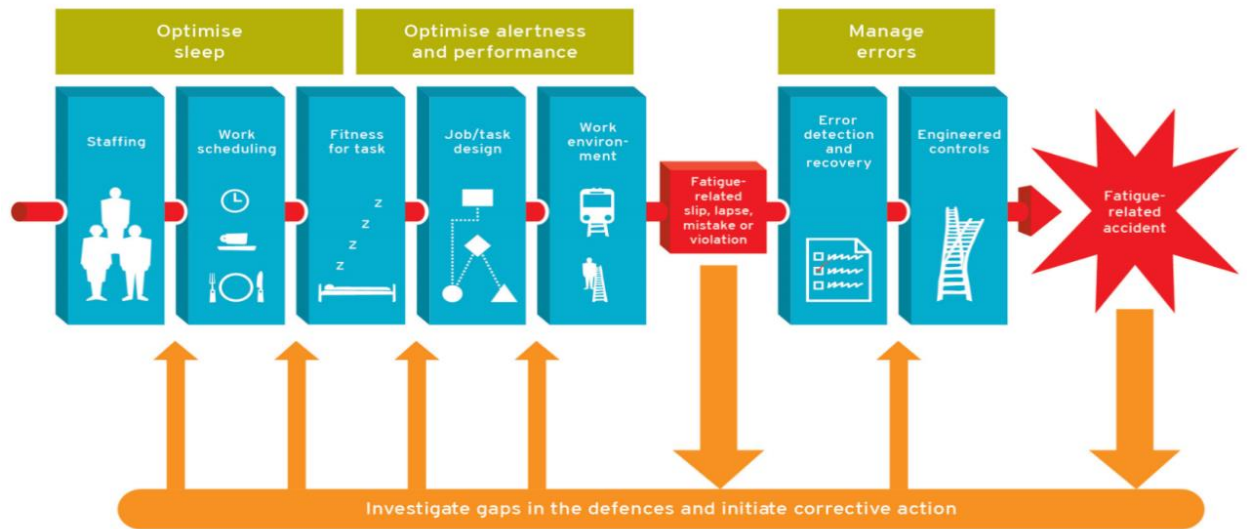
Traditionally, fatigue related risk has been regulated through specifying and controlling hours of work, shift lengths, etc., including within instruments such as industrial awards. This was the original approach of the Western Australian Working Hours Code of Practice 2006 adopted by a number of other jurisdictions, and aimed at regulating the hours of work in the Fly In Fly Out (FIFO) workers in the mining sector. While useful, this does not pick up broader fatigue issues such a worker taking a second job or lack of sleep for domestic or health reasons. The current suite of material by the WA Department (WA DMIRS nd) is much more sophisticated.

There is a wide range of literature defining how to set up the most appropriate shift rosters that, excluding external issues, provide good first steps to mitigating fatigue

Based on James Reason's work on defences in depth (1997), Dawson and others developed a tiered model to control fatigue. An updated paper on the model is provided in Dawson et al, 2017. A useful alternate model is provided by Moore-Ede (undated). Both these provide a systems approach that take into account most aspects that are needed to adequately control fatigue in an organisation. Combining aspects of both provides the following:

1. Provide the best working environment through the use of sufficient staffing levels, appropriate shift scheduling and hours of work and physical environment such as lighting, etc.;
2. Check that employees have appropriate opportunity for sleep, and receive training on sleep practices and sleep disorders that could affect sleep;
3. Undertake physiological and behavioural monitoring to ensure fitness for duty;
4. Provide peer monitoring, and analysis of errors to include information on fatigue.

A combined system has been adopted by the Office of the National Rail Safety Regulator (ONRSR 2017) and a schematic of their fatigue management system is shown below:



Adapted from Reason (1997), Dawson and McCulloch (2003) and Moore-Ede et al (2009)

## Summary

The AIHS believes that:

1. Organisations need to accept that fatigue is a hazard, and consistent with workplace health and safety law, need to control it;
2. Work Health & Safety Regulators in all jurisdictions, consistent with the recommendations of the Boland Review on OHS, need to upgrade their guidance on fatigue hazards to provide appropriate signal to organisations.

## References

Abbood H et al, 2014, Prediction of Driver Fatigue, [ieeexplore.ieee.org/xpls/abs\\_all.jsp?arnumber=6930193](http://ieeexplore.ieee.org/xpls/abs_all.jsp?arnumber=6930193)

Anderson et al, 2013, *J Clin Sleep Med*, 9(9), 907-920

ATSB, 2017, SafetyWatch: Fatigue, [https://www.atsb.gov.au/safetywatch/sw\\_fatigue/](https://www.atsb.gov.au/safetywatch/sw_fatigue/)

CASA, 2019, Fatigue Management, <https://www.casa.gov.au/standard-page/fatigue-management>

Dawson D, Reid K, 1997, Fatigue, alcohol and performance impairment, *Nature*, 388 (6639), 235

Dawson D, McCulloch K, 2005, Managing Fatigue: It's about sleep, *Sleep Medicine Reviews* 9, 365-380

Dawson D, et al, 2014, Evaluating the use of fatigue detection technologies, *Sleep Medicine Reviews*, 18, 141-152



Dawson et al, 2017, Fatigue Proofing, *Accident Analysis & Prevention*, 99(Part B), 465-468

Moore-Ede M, (nd) Evolution of Fatigue Risk Management Systems  
[http://www.circadianinfo.com/landing/The\\_Evolution\\_of\\_Fatigue\\_Risk\\_Management\\_Systems.htm](http://www.circadianinfo.com/landing/The_Evolution_of_Fatigue_Risk_Management_Systems.htm)

NRSS, 2018, Fatigue, <https://roadsafety.gov.au/action-plan/2018-2020/fatigue.aspx>

NT, 2016, Fatigue Management Road Transport Code of Practice  
[http://www.worksafe.nt.gov.au/forms-resources/Documents/nt\\_fatigue\\_management\\_cop.pdf](http://www.worksafe.nt.gov.au/forms-resources/Documents/nt_fatigue_management_cop.pdf)

ONRSR, 2017, Managing fatigue, <https://www.onrsr.com.au/safety-improvement/managing-fatigue>

Paterson J, Dawson D, 2012, "Psychosocial Hazards: Fatigue", SIA OHS Body of Knowledge, Chapter 20, <https://www.ohsbok.org.au/wp-content/uploads/2013/12/20-Hazard-Fatigue.pdf?x19450>

Petrilli R et al, 2005, *Industrial Health*, 43, pp186-192

Russo et al (2003) "Oculomotor impairment during chronic partial sleep deprivation" *Clinical Neurophysiology*, v114 pp723-736

Safe Work Australia (2013) Fatigue, <https://www.safeworkaustralia.gov.au/fatigue>

WA DMIRS, (nd) "Guidance about preventing and managing fatigue",  
<http://www.dmp.wa.gov.au/Safety/Guidance-about-preventing-and-7034.aspx>