Improving safety for ‘drive-in, drive-out’ professionals
by Dr David Logan, Senior Research Engineer, Monash University Accident Research Centre (Monash Injury Research Institute)

Recently the Royal Flying Doctor Service (RFDS) in central Queensland warned that fatigue amongst ‘drive-in, drive-out’ miners was causing an increase in the number of accidents.

The issue of fatigue and its impact on the often long drive home from working in mines is gaining increasing attention. What is often less discussed is the issue of accidents occurring while miners are on the job – not necessarily in trucks and large vehicles but those thousands of workers who use light four-wheel-drive (4WD) vehicles to check gas lines, travel off road to carry out maintenance or simply travel from site to site as part of their working day.

The Monash Injury Research Institute (MIRI) recently worked with a major mining company to review their vehicle fleet with the aim of improving both the inherent safety of the fleet, as well as ensuring that drivers are operating to the same high standard. One possible solution being investigated worldwide is the installation of in-vehicle monitoring systems that can warn drivers, as well as managers for more serious breaches, when driving behaviour is becoming unsafe.

Safe light vehicles for the industry

One of the most common light vehicles used by the mining industry is the Toyota Land Cruiser 70-series. According to the Australasian New Car Assessment Program (ANCAP), Australasia’s leading independent vehicle safety advocate, the Land Cruiser has only a three-star rating. ANCAP safety ratings are determined based on a series of internationally recognised crash tests, with vehicles awarded an ANCAP safety rating of between one to five stars indicating the level of safety they provide in the event of a crash and their ability, through technology, to avoid a crash.

The issue with the Land Cruiser is that it has no electronic stability control which precludes it from an ANCAP five-star rating, nor is this complex technology able to be retrofitted.

Electronic stability control (ESC) is particularly important for this class of vehicle because they are particularly susceptible to rollover. Four wheel drive vehicles are high off the ground with tall tyres. This, combined with the often poor conditions of the roads on and between mine sites can contribute to roll over crashes.

Rechnitzer et al (1996) reported (on an Australian based study of rollover using 1988 Federal Office of Road Safety (FORS) Fatality File data) that rollovers ‘constitute 19 per cent of occupant fatalities in Australia’. The problem of rollover is magnified further when vehicles are operated in a non-urban environment. Rechnitzer et al (1996) reported that ‘rollover crashes are a common cause of occupant injury, especially on non-urban roads. They constitute 44 per cent of occupant fatalities in rural Western Australia and 54 per cent in rural Northern Territory’.

Mining companies should consider ANCAP five-star vehicles when they are replacing their fleet. The inclusion of ESC has been shown to reduce single vehicle driver injury crashes in 4WDs by around 65 per cent and that where ESC is not available, mining companies should lobby the vehicle manufacturers to incorporate this life-saving technology as soon as possible.

Making drivers safer

While driver training courses have their merits, there is concern that they are often provided under ‘artificial circumstances’, teaching people how to respond to emergency situations at a time when they are acutely aware of what is going on around them. In the real world, mining industry workers are driving while at work – they are thinking about what work needs to be done, issues that need addressing at the next site – and not necessarily focusing on how to get out of a dangerous situation.

Increasingly, mining companies are introducing in-vehicle monitoring as a means not only of measuring how their staff members are driving, but also as a warning system for staff that are routinely driving unsafely. These monitoring systems can range from warning signals that are triggered by failure to put on a seat belt or speeding, to monitoring illegal driving behaviour such as repeated heavy braking and acceleration which could indicate reckless driving.

The introduction of a keycard system by some mining companies has allowed the detection of these behaviours when they occur far from the scrutiny of managers. These issues can then be identified and discussed with the staff member before an accident occurs.

In reality, drivers should behave as if they have their managers in the seat next to them at all times. Simply having a monitoring device fitted can act as a deterrent to poor driving behaviour, as well as providing warnings that a driver might require intervention. Vehicle monitoring systems are designed to be almost completely unobtrusive to drivers who are behaving in accordance with company policy and the law and most drivers will practically forget they are fitted.

It is possible for mining companies to develop a vehicle matrix that provides an indication of suitable/not suitable vehicles for various conditions. The matrix should:

• enable prioritisation of replacing vehicles based on reviewed safety features, while accommodating the utility needs required by various divisions within the company.
• enable the development of a phased plan to replace unsafe vehicles within the fleet progressively.

Should a mining company decide to create a transition plan towards a safer vehicle fleet, a plan needs to be developed to account for:

• process of replacing vehicles versus financial costs associated
• removal of number plates for vehicles that are deemed unsuitable for on road use.

Any change to alternative – and safer – vehicles may require an education program amongst staff; such an education campaign for employees must explain:

• the purpose/aim of replacing existing fleet (emphasis on safety of employees), including an explanation of previous safety issues associated with existing fleet of vehicles
• the five-star ANCAP rating of vehicles and the used car star ratings, as a background for reviewing vehicle safety
• the advantages expected from introduction of the changes, as well as addressing potential disadvantages perceived by employees
• the process by which the vehicle fleet is expected to be replaced.

Making sure employees make it home safely

In 2010-11 20 people working in the coal mining and road freight industries died while commuting to or from work. The RFDS recently warned that fatigued drive-in, drive-out miners are causing increased numbers of accidents in central Queensland. In the 2010-11 financial year, out of the 2170 patient transports the RFDS carried out from Rockhampton, more featured miners than other professions.

Fatigue is a serious issue in mining, particularly once mine workers get into a car to drive often long distances home after a lengthy shift. Central Queensland coroner Annette Hennessy recently made 24 recommendations for the industry following her investigation into two separate fatal road accidents – in Yeppoon in 2005 and Dysart in 2007. Ms Hennessy stated that driver fatigue was a potential factor in both incidents where coal miners were driving home following work.

While mining companies have little control over what happens once their staff clock off, it is recommended that companies consider offering staff other forms of transport back to a central town/city where public transport can then be accessed, such as chartered buses or flights. It is important for mining companies to inform their staff of the risks associated with their current means of commuting with vehicles that may be less safe than those they are using while at work.

Companies should also discuss fatigue-related risks associated with commuting and support employees in adopting measures to minimise these risks as well as the potential benefits of commuting using other means of transport.

References


Continued from page 58

environment in which their members were expected to work.

Every underground operator was empowered to cease work and seek geotechnical advice if necessary at any time. A feedback system was developed through the weekly reporting system to ensure that any issue raised by the workforce received a direct response. This happened as a matter of course for all rock noise or rockfall reports and on request for all other matters.

Summary

Managing mining-induced seismicity was a full time occupation at the Tasmania Mine following the Anzac Day 2006 rock fall. This was necessary in order to satisfy the regulator that mining could recommence. Following the onset of seismicity in 2002, it was not going to go away unless mining stopped. Procedures were developed to manage seismicity, but events in 2006 clearly illustrated that a quantum advance in the available techniques and tools was required to achieve an acceptable outcome.

Every endeavour was taken at the Tasmania Mine to ensure that these techniques and tools were developed. Certainly the effort expended saw the Tasmania Mine continue to operate until the ore reserve was finally exhausted in 2012. It can only be hoped that some of the lessons learned will be of use to others faced with the OH&S challenge of active seismicity in their mines.

References


