



Department of Consumer
and Employment Protection
Government of Western Australia

Resources Safety 

Mines Safety Bulletin No. 73

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Subject: Loss of control of on-highway type vehicles

The hazard

In September 1997, the driver of a water cart was fatally injured when the vehicle lost control while watering down the main ramp of an open pit mine, tipped onto its side and collided with the pit wall. The water cart was an on-highway type truck and was not fitted with a rollover protective structure (ROPS). Significant Incident Report No. 84, written as a result of the incident, recommended:

- fitting ROPSs on highway type trucks used as water carts
- regular and effective examination and maintenance of braking systems
- consideration of suitable retarding barriers
- provision of adequate training for operators, including emergency procedures
- a review, using a risk assessment approach, of the suitability of equipment used in quarrying operations.

Safety Bulletin No. 52 was issued in May 2000 in response to numerous incidents involving the loss of control of on-highway type road-watering trucks. The bulletin highlighted two main causal factors for these incidents:

- inadequate braking systems for the trucks
- less-than-adequate training of operators.

The bulletin also discussed the general duty of care to ensure all equipment is fit for purpose and concluded that all mine operators should adopt a risk management approach to determine the suitability of vehicles used as water trucks and for other ancillary tasks. It also concluded that the use of on-highway type trucks for water cart duties in deep open pits was less than adequate.

Over the last two years there has been a concerning increase in incidents involving loss of control of on-highway type vehicles on mines. It appears that some of the lessons from historical incidents have been forgotten. This mines safety bulletin highlights several recent incidents that involved various on-highway type vehicles being used at both surface and underground mine sites in Western Australia. Fortunately, no serious injuries resulted from these incidents but, in most cases, the potential consequences were extreme — that is, serious injury or fatality. The aim of this bulletin is to raise industry awareness of the issues involved in this type of incident, including associated legislative requirements. Industry is urged to proactively review the work processes and systems associated with this type of equipment, and implement appropriate measures to minimise the likelihood of similar incidents in the future.

A summary of selected incidents is listed below:

February 2003

The operator of a service truck descending a pit ramp experienced braking difficulties and drove into a windrow to stop the truck. One of the service brake diaphragms had failed, resulting in the loss of air

pressure. Roadway conditions were wet and muddy. Although the truck's primary brakes were in a generally serviceable condition, there was no secondary or emergency braking system.

July 2003

A loaded bulk explosives mixing vehicle lost all braking systems when travelling down a pit ramp. The vehicle rolled onto its side when negotiating a bend on the ramp. 'Spongy' brakes had been identified two days previously but not reported. The investigation revealed that the brakes were adjusted incorrectly. Deficiencies with maintenance practices, service schedules and training programs were identified.

September 2004

A 50 t mobile crane lost control travelling down a pit ramp. The crane reached speeds of 80 km/h before negotiating a temporary access ramp and coming to rest on a bench. The runaway initiated after a gear change and incorrect operation of a retro-fitted gearbox. The brakes were ineffectual and did not stop the crane due to their incorrect assembly.

October 2004

A Franna crane lost control while tramming down a decline with a suspended load. The brakes failed to stop the crane so the load was lowered to the ground to halt the vehicle.

November 2004

An on-highway type water cart collided with a dump truck after losing brakes when travelling down a pit ramp. The incident began with the selection of the wrong gear (ie human error) but the braking system failed to stop the truck when it gathered speed. Investigation indicated the brakes were inefficient due to the presence of mud inside the brake booster chamber and slack brake adjusters. Servicing and inspection procedures were inadequate.

June 2005

The brakes of an on-highway type water truck failed when it was travelling down a pit ramp. The operator drove the truck into the wall to stop the vehicle then continued to use the truck after discharging some of the water. The operator had noticed problems with the brakes at a previous stop or call-up point but elected to continue down the ramp. The truck was not designed nor intended for use in the open pit at this mine site. However, this restriction was not clearly communicated to the workforce. Inappropriate channels of communication and poor operational planning allowed the truck to be used in an unsuitable application.

April 2005

A loaded concrete agitator truck lost control while travelling down a decline due to failure of the service brake system. The operator steered the truck into the wall to slow the truck and did not activate the emergency braking system. The design of the emergency switch did not facilitate ease of use. The truck rolled onto its side and was extensively damaged. Issues identified during the investigation included shortcomings in operator training and maintenance programs. Following the incident an independent consultant was commissioned to test the braking systems of the concrete trucks on site and assess their effectiveness for work performed by the units.

Contributory factors

The types of vehicles and circumstances involved in these incidents are many and varied. Causal factors for these incidents include:

- vehicle's braking systems not being adequate for the application and operating conditions
- defects in braking systems
- inadequate vehicle inspection, maintenance and servicing regimes
- no or inadequate operating procedures, such as speed limits and gear specification
- inadequate operator training in operating the vehicle and emergency procedures
- operation of defective equipment

- insufficient risk assessment prior to use of the equipment
- equipment modifications made without proper change management processes.

It is obvious that these factors are similar to those raised in previous safety information provided by the Mines Inspectorate and from other sources.

Legislation relevant to these incidents includes the general duty of care provisions of the *Mines Safety and Inspection Act 1994*, and specific requirements under the Mines Safety and Inspection Regulations 1995.

Section 9 of the Act requires employers to provide and maintain safe workplaces, plant and systems of work. In the context of this bulletin, this would include fit-for-purpose equipment, risk assessment processes, maintenance and service programs, safe operating procedures and operator training.

Section 10 requires employees to take reasonable steps to ensure the safety and health of themselves and others. This would include reporting defects and not using defective equipment. Section 11 specifically requires the reporting of potentially hazardous situations.

Some specific regulations that are directly applicable to this discussion include, but are not limited to:

- Regulation 4.13: Training and induction of employees
- Regulation 6.2: Plant to be maintained and operated in safe manner
- Regulation 6.17: Employer to identify hazards associated with plant and assess risks
- Regulation 10.38: Trackless units — braking systems
- Regulation 13.2: Motor vehicle brakes.

Recommendations

Principal employers, employers and managers needs to proactively assess all aspects of the work process associated with the use of on-highway type equipment at mines, including the selection and condition of equipment, competency of personnel, systems of work and operating environment. A risk assessment approach should be adopted to identify hazards, assess the risks and identify appropriate measures to manage the risk based on the hierarchy of controls. The goals are to reduce the risks to personnel to acceptable levels and ensure compliance with relevant legislation.

Importantly, this risk assessment approach should not be a one-off exercise. It should be an integrated part of the safety management system to assess and manage risks associated with the application of mobile equipment on an ongoing basis.

M J Knee
STATE MINING ENGINEER