Mines Safety Bulletin No. 106

Subject: Loss of control of service vehicles on declines in underground mines

Date: 8 July 2013

Summary of hazard

In recent years, there have been a number of serious accidents associated with the loss of control of service vehicles on declines in underground mines.

The vehicles involved have included concrete agitator trucks, light delivery trucks, diesel fuel transports, water carts and lubrication service trucks. Many of these vehicles are designed for surface applications on sealed public roads. Their loads, gear ratios and braking capability are configured for operating environments that are substantially different to the conditions found in underground mines.

Travelling down the decline with a full load can be particularly problematic. The initial loss of control is often associated with the vehicle being either in the wrong gear or out of gear. In many cases, the manual gear cannot be re-engaged by the operator, or the automatic transmission may prevent the gear from engaging to avoid gear damage. If the gear is not engaged, the truck can pick up speed very quickly.

Service and auxiliary brakes may not be capable of controlling the truck during the descent. They can overheat with continuous use if engine braking is not assisting and if the energy created during braking is not adequately absorbed. This can lead to a loss of service brake function.

Contributory factors

- Rather than using engine braking as a primary retarding mechanism on declines, service brakes are used in an attempt to control vehicle speed whereas they should only provide a trimming function. Excessive premature wear of brake linings is commonly an indicator of this braking practice.
- Passing problems on declines requiring drivers to change gear can result in incorrect gear selection or the disengagement of gears.
- Vehicle maintenance information from original equipment manufacturer (OEM) manuals typically relates to the designed surface application and the modifications required to operate in an underground mining environment are usually not detailed.
- Training courses are commonly not specific to the site and machine so some generic training modules miss important information on the safe operation and maintenance of vehicles.
- Operators panicking in emergency situations sometimes resort to using the side wall to slow their vehicle, which can result in serious injuries.

Recommendations

A more rigorous approach when assessing the safe operating conditions for service vehicles will help reduce the potential for loss of control of service vehicles on declines in underground mines.

Level 1, 303 Sevenoaks Street (cnr Grose Ave) Cannington WA 6107
Postal address: Mineral House, 100 Plain Street, East Perth WA 6004
Telephone: (08) 9358 8002 Facsimile: (08) 9358 8000 ResourcesSafety@dmp.wa.gov.au
www.dmp.wa.gov.au
wa.gov.au

Service and maintenance

- Carry out a detailed risk assessment whenever a new vehicle is specified for use at a mine. This is even more important when the machine is not specifically designed for underground applications. The risk assessment should address the operational and maintenance requirements specific to the site and machine.
- Check the maximum load-carrying capability of the vehicle against its operating and braking characteristics to determine its maximum capacity.
- Evaluate brake performance using diagnostic checks rather than simple drive-through tests on service and auxiliary brakes.
- Determine brake service intervals on the basis of the mine conditions. Weekly brake studies may be appropriate when operating on declines.
- Ensure service staff are familiar with the detailed braking requirements for operating in an underground mining environment.

Training

- Provide operators and maintenance staff with training that is specific to the site and machine.
- Emphasise the importance of setting and staying in gear when accessing declines.
- Explain the practical importance of engine braking and retarders, and discourage the practice of riding the brakes as this can significantly reduce braking capability.
- Consider using simulators for training purposes so that emergency measures can be practised in a safe environment, rather than in a real-life situation.

Additional information

Visit the publication section of the Resources Safety website at www.dmp.wa.gov.au/ResourcesSafety for the following safety alerts.

Mines Safety Bulletin No. 73 *Loss of control on highway-type vehicles*

Mines Safety Bulletin No. 72 *Loss of control LME on gradients*

Mines Safety Bulletin No. 52 *Operation of water trucks in open pit mines (quarries)*

Significant Incident Report No. 183 *Loss of brakes on dump truck*

Significant Incident Report No. 178 *Water cart loss of control at portal – inadvertent access to underground*

Significant Incident Report No. 139 *Loss of control of service vehicles*

Significant Incident Report No. 84 *Loss of control of water cart – fatal accident*

Simon Ridge

STATE MINING ENGINEER