

MINE SAFETY INVESTIGATION UNIT

INFORMATION RELEASE

High potential incident

Date	18 October 2013
Event	Light vehicle crushed by D11 dozer
Location	Mount Arthur Mine, Upper Hunter Valley NSW

At a glance

A 100 tonne D11 Caterpillar dozer (the dozer) reversed over a light vehicle (LV) that entered the work area of the dozer. The dual cabin Volkswagen Amarok utility was extensively crushed, but the LV driver was not injured.

This incident occurred on an access ramp during back blading works.



Figure 1 Photographs of the incident scene from the passenger and driver sides, taken by the mine.

The mine's photographs are a reminder of the consequences that may occur when light vehicles come into contact with heavy earthmoving machinery. The photos also demonstrate the extent of the damage and potential for harm.

The incident

The incident occurred at 1.17 pm during the day shift at the bottom of an access ramp to an excavator bench. The weather conditions were fine.

Before the incident, the LV driver was operating a haul truck at a mine shovel operation. The shovel required the floor of its operation to be cleaned but the plant normally used to perform this task had broken down.

The LV driver was redeployed and drove the LV to a parking area of a nearby excavator bench where he collected a dozer while the operator was on a meal break. The LV driver used the dozer to complete the shovel clean-up works.

The LV driver then trammed the dozer to the excavator bench and pushed in a new ramp to access the LV in the parking area below. At that time, the dozer operator was waiting at the parking area for the LV driver to return with the dozer.

The LV driver and the dozer operator had a conversation and decided the dozer operator would smooth out the new access ramp. The LV driver was to wait at the designated parking area until the work was completed.

The dozer operator started back blading (the practice of dragging the back of the dozer blade, while reversing the dozer to smooth out the surface) the access ramp by reversing from the bench down the ramp towards the parking area.

During these works, the LV driver said he drove the LV towards the dozer as he believed that the dozer operator had finished the back blading work.

The LV driver also reported he attempted to make positive radio contact with the dozer operator and believed that he had made such contact. However, the dozer operator was on another radio channel to his supervisor and did not hear the LV driver's radio call.

The LV driver stopped at the bottom of the ramp and waited for the dozer to stop. When the LV driver realised that the dozer operator was not going to stop he attempted to engage reverse gear. The LV driver reported he was unable to engage reverse gear and he began sounding the LV's horn. As the dozer approached, the LV driver remained in the LV.

The dozer operator was unaware that the LV had approached within 50 m of the dozer and was now directly behind the dozer. As the dozer reversed, the dozer operator reported he was focusing on the back blading task and could not see the LV.

The dozer reversed 2.5 m over the passenger's side of the LV with its left hand track before stopping and moving in a forward direction. The LV driver escaped without injury.

An excavator operator working nearby saw the incident and initiated the mine's emergency procedure. Both workers were taken to the mine's first aid room for assessment and later underwent mine drug and alcohol testing.

The mine

Mount Arthur Coal is an open cut coal mine that produces thermal coal for domestic and export markets for power generation. It is one of the largest individual coal production sites in the Hunter Valley producing 17.08 million tonnes of raw coal per annum in 2010-2011. This output is achieved using five shovels, nine excavators, two front end loaders, 23 dozers and a fleet of 105 trucks ranging in capacity from 200 to 300 tonnes.¹

Mount Arthur Coal is less than five kilometres from the town of Muswellbrook in the Upper Hunter region of NSW.

¹ NSW Trade & Investment, *2013 Coal Industry profile*, 63, 207.

Current mining activities are focused on 21 seams of coal. Large electric shovels are used to remove overburden and excavators are used to load coal into large haul trucks for transportation to the coal handling and preparation plant.²

Observations

The use of transport rules and radio communication protocols is common in many surface mine operations. These procedural controls provide soft risk management barriers and consideration should be given to more effective layers of protection to manage LV and heavy machinery interactions. These may include designated LV only roads and access areas, use of proximity detection/collision avoidance technology, or a combination of both (elimination and engineering controls).

The circumstances of this incident highlight the vulnerability of a light vehicle in this work environment. In this case, it appears the mine's transport rules were not followed and positive radio contact was not established. The two operators were on different radio channels and other two-way radio calls from around the mine appear to have confused the LV driver's perception of whether he was able to approach the dozer. Clear and unambiguous radio communications systems are a vital part of the safety system of every mine and constant attention must be applied to ensure their effectiveness.

Safety considerations

This incident highlights the importance of an effective risk management program in relation to LV and heavy machinery interactions. Accordingly, mine operators must pay particular attention to the following safety considerations:

- The effectiveness of transport management rules and procedures.
- Opportunities to eliminate LV and heavy machinery interactions.
- Implementation of hard barriers in lieu of procedural/soft controls.
- The effect and impact of human factors when reviewing risks.
- The use of technology such as collision avoidance and proximity detection systems on mining equipment and vehicles.
- The impact of task specific activities on situational awareness such as back blading.
- The adequacy of current fitness for work programs.
- The adequacy and effectiveness of radio communication systems.

Industry resources

The following relevant industry resources are available on the department's website:

- *MDG 2007, Guideline for the selection and implementation of collision management systems for mining*, draft July 2013. www.resources.nsw.gov.au/safety/publications/mdg/2000
- *MDG 15, Guideline for mobile and transportable equipment for use in mines*, www.resources.nsw.gov.au/data/assets/pdf_file/0010/419446/MDG-15.pdf
- *Amendments No.2 – MDG 15, Guideline for mobile and transportable equipment for use in mines*, www.resources.nsw.gov.au/data/assets/pdf_file/0020/420518/MDG-15-Amendments-No-2.pdf

Further links to information on collision avoidance:

- www.resources.nsw.gov.au/safety/publications/seminar-presentations/2011-proximity-detection-workshop
- www.mines.industry.qld.gov.au/safety-and-health/proximity-detection-workshops.htm

² Source, www.infomine.com/minesite/minesite.asp?site=mtarthur, 6 February 2014.

- www.msha.gov/Accident_Prevention/NewTechnologies/ProximityDetection/ProximitydetectionSingleSource.asp

About this information release

The Mine Safety Investigation Unit has issued this information to draw attention to the occurrence of a serious incident in the mining industry. The investigation is ongoing. Further information may be published as it becomes available.

The information contained in this publication is based on knowledge and understanding at the time of writing. However, because of advances in knowledge, users are reminded of the need to ensure that the information upon which they rely is up to date and to check the currency of the information with the appropriate officer of the Department of Trade and Investment, Regional Infrastructure and Services or the user's independent adviser.

Information about the Investigation Unit and its publications can be found at: www.resources.nsw.gov.au/safety/major-investigations

For information about health and safety regulation on mine sites contact a mines inspector at one of our local offices www.resources.nsw.gov.au/safety/mine-safety-offices.

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