

SAFETY BULLETIN

DATE: JULY 2019

Safety critical system failures on road registered vehicles

This safety bulletin provides safety advice for the NSW mining industry.

Issue

Repeated incidents involving the failure of safety critical systems on mobile plant were reported to the NSW Resources Regulator in 2019. These incidents have resulted in vehicle rollovers and collisions. All of these incidents occurred with road-registered plant operating on active haul roads within mining operations. Although nobody was injured in any of these incidents, several incidents had the potential to result in fatalities.

The incidents referred to below have one or more common factors:

- All involved road-registered vehicles.
- All involved the failure of safety critical systems such as brakes or steering.
- All occurred on active haul roads at operating mines.
- All involved a vehicle rollover or collision.
- All had the potential to cause a single or multiple fatalities.

Circumstances

Incident 1:

A road-registered medium, rigid truck was fitted with a watercart and was operating in an open cut coal mine. The truck was descending a ramp while operating in drive with service brakes being used to control the speed. Since the transmission was in drive, the exhaust brake was ineffective. As the speed increased, the operator tried unsuccessfully to slow the truck. The operator then steered into a windrow to slow the truck. This resulted in the truck rolling. The operator suffered a fractured wrist and bruising.

An independent investigation identified the cause of the incident as driver reliance on service brakes and brakes out of adjustment. The vehicle should have been driven in a lower gear and the exhaust brake should have been used to control the speed of the vehicle. The inspection identified five of the six brake units fitted were out of adjustment even though they had been adjusted during a service two weeks prior.

Figure 1 The truck rolled when the driver was unable to control the speed



Incident 2:

A mobile slew crane rolled following a loss of brakes. The crane had arrived and was being escorted to the job site. While descending the third consecutive ramp to the work area, the brakes failed to slow the vehicle. The exhaust brake was not effective because the crane was being driven in a high gear. While trying to slow the crane, the operator steered the crane into a windrow at the side of the road causing the crane to roll. No injuries were reported.

An independent investigation identified the cause of the incident as incorrect use of the brakes and brakes out of adjustment. The operator relied on the service brake and failed to adequately use the exhaust brake to control the descent speed of the crane. Additionally, seven of the eight brake units were found to be adjusted outside roadworthy limits.

Figures 2 and 3 Incorrect use of brakes and brakes out of adjustment caused this crane to roll



Incident 3:

A fitter was driving a light vehicle through the pit at the end of nightshift. The driver hit a small bump in the road and lost all steering. The vehicle travelled 30m and ran up a windrow which turned the vehicle onto its side. The rollover did not result in any injuries either to the driver or the passenger.

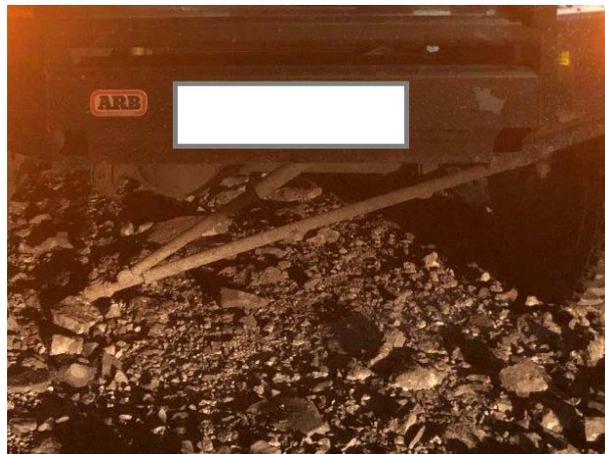
Figure 4 The light vehicle ran up a windrow and rolled



Incident 4:

The light vehicle's steering arm failed, causing the vehicle to veer onto the wrong side of a haul road. The haul road was not active at the time but was scheduled to be active later that night. In this case, the driver was the only person at risk. No injuries were sustained in the incident. The loss of steering was caused by failure of the ball joint in the steering tie rod assembly.

Figures 5 and 6 The steering arm failed on this light vehicle



Recommendations

1. Safety critical systems such as braking and steering systems on mobile plant must be inspected, tested and maintained so that the systems operate effectively and remain effective.
2. Road registered vehicles such as light vehicles and trucks used in mines may be subjected to higher loads or environmental factors which adversely affect service life. Maintenance strategies must consider OEM recommendations for:
 - a. inspections,
 - b. testing,
 - c. maintenance and replacement intervals,
 - d. the operating conditions of the mine,
 - e. the service duty or severity of the application,
 - f. the criticality of a potential failure and any failure history.
3. The competency of tradespersons working on safety critical systems should be assessed and verified to ensure work is carried out correctly and does not pose a risk to the operation of the vehicle.
4. Following work on safety critical systems, the system should be inspected and tested to verify that it is safe to operate, before re-entering service.

5. Mines must have systems in place to confirm that safety critical systems, such as brakes and steering on hired or contractor supplied items of plant, are fit for use and have been adequately maintained.
6. Mines should review their introduction to site processes to ensure they include suitable and adequate verification of brakes. Mines should also ensure steering systems are maintained, tested, inspected, adjusted and have a suitable remaining service life.
7. Where mines do not directly perform maintenance on hired or contractor-provided mobile plant, mines should review hire or contractor management plans to include verification of service providers to maintain safety critical systems effectively. This should include triggers for short- term hirers that develop into extended hire periods and contractors who enter sites periodically over months or years.

Related information

NSW Resources Regulator safety alerts and bulletins:

- [SB10-01 Brake problems associated with road registered truck use at mines](#)
- [SB10-03 Mobile plant - safety critical systems](#)
- [SA06-12 Maintenance of safety critical systems - braking, steering and warning systems](#)

Queensland Department of Natural Resources, Mines and Energy:

- [Engineering and maintenance of mobile plant braking systems](#)
- [Brake problems on on-highway trucks at mines](#)
- [Brake system maintenance – rubber tyred vehicles](#)
- [Heavy rigid truck runaways on the increase](#)

NOTE: Please ensure all relevant people in your organisation receive a copy of this safety bulletin and are informed of its content and recommendations. This safety bulletin should be processed in a systematic manner through the mine's information and communication process. It should also be placed on the mine's common area, such as your notice board where appropriate.

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DOCUMENT CONTROL

CM9 reference	DOC19/510403
Mine safety reference	SB19-06
Date published	17 July 2019
Authorised by	Chief Inspector Office of the Chief Inspector