Resources Regulator
Department of Regional NSW

Discussion paper

Vehicle interaction controls in NSW mines

July 2023

Published by the Department of Regional NSW

Title: Discussion paper

Subtitle: Vehicle interaction controls in NSW mines

First published: July 2023

Department reference number: RDOC23/125597

Authorised by: Chief Inspector

Amendment schedule		
Date	Version	Amendment
June 2023	1.0	First published

Table of Contents

Foreword

The NSW Resources Regulator has ongoing concerns regarding the number of adverse vehicle interactions occurring at NSW mines, with no meaningful reduction in the number of incidents being reported year on year. It is reasonable to say that this is in-part due to mine operators increasingly reporting near-misses, however the Regulator has undertaken assessment program plans and targeted assessment campaigns for several years with no appreciable impact in reducing the number of incidents.

Mine operators have a duty of care to provide and maintain a safe working environment, and an obligation to apply the hierarchy of controls if eliminating risks to health and safety is not reasonably practicable.

In collaboration with the NSW Minerals Council, the Regulator has held a series of forums to promote the development and implementation of effective vehicle interaction risk controls, including the adoption of engineering controls.

Although the Regulator acknowledges and encourages the initiatives of mine operators, suppliers, and industry organisations such as Earth Moving Equipment Safety Round Table (EMERST) and the International Council of Mining and Metallurgy (ICMM) in developing systems and technologies to reduce adverse vehicle interactions, more efforts are needed to integrate these systems at mines.

Background

Proximity detection (PD) and collision avoidance (CA) technology has been available for decades and has been mandated for some mining applications in the United States and more recently South Africa. While the utilisation of PD/CA systems has increased in some underground applications, there is yet to be implementation of PD/CA technology in NSW mining that can considered reliably capable of correctly discriminating between potentially hazardous or spurious conditions.

The Regulator has carried out several investigations into serious or potentially serious incidents involving equipment collisions or workers being struck by moving equipment in both surface and underground mines over the past three years. Some of these investigations revealed that established and understood controls failed, and a reliable collision avoidance or proximity detection system could have acted as a crucial barrier to prevent such incidents.

However, one significant issue to date has also been the tendency to view the technology as a ‘silver bullet’. There has been an unrealistic expectation that the implementation of a CA or PD system alone would address deficiencies in pre-existing vehicle interaction (VI) controls and eliminate adverse interactions.

Moreover, an assessment program initiated by the Regulator in response to a serious incident at an underground mine has shown that many mine operators have not thoroughly analysed the effectiveness of their current vehicle interaction controls, rectified deficiencies in their current controls, or rigorously assessed and understood the capability and applicability of PD and CA technology. Therefore, it is questionable whether mine operators have been able to determine if the technology has delivered a measurable benefit after installation.

Industry engagement and outcomes

The Regulator has collaborated with the NSW Minerals Council to promote the implementation of systems and technologies that reduce adverse vehicle interactions. The following is a summary of the outcomes achieved so far:

Collision Avoidance Forum 1 held 22 March 2022

Key outcomes:

- Technology still requires further development, integration, and implementation.
- Some mines have installed technology with limited success.
- Challenges include nuisance alarms, overcoming existing VI performance deficiencies and inadequate human factors design in operator interfaces.
- The industry is gaining knowledge about the EMERST/ICMM VI improvement resources and ongoing projects.

Collision Avoidance Forum 22 February 2023

Key outcomes:

- Successful implementation of PD and CA technology at BHP's Broadmeadow UG coal mine.
- Successful trial completed of PD technology at Glencore's Glendell Mine, with plans to expand to other sites.
- Anglo America and Rio Tinto refocusing on EMERST control effectiveness model Levels 1 to 7 type controls.
- Good industry awareness of EMERST 9 level control effectiveness model and ongoing work by EMERST & ICMM, including their 'Leading Sites' project to advance VI control effectiveness.
- Industry suppliers presenting ongoing development of PD and CA technology

Online forum active from May 2022 through to April 2023

Key outcomes:

- Little engagement by industry via the online forum format.
- The format was discontinued.

Based on the engagement so far, the Regulator is now seeking feedback on potential pathways forward and its regulatory position.

Regulator feedback

You are invited to have your say on the pathway forward and regulatory position the Regulator should take in its approach to address adverse VI occurrences in the NSW mining industry. Detailed in this section are options we have developed in consultation with the NSW Minerals Council. Your feedback is not limited to the options listed below, you can propose alternate pathways or positions that are not listed.

Feedback on pathways

The following pathways have been proposed as possible compliance directions for the Regulator to address adverse VI in the NSW mining industry. These pathways are not mutually exclusive, and based on industry feedback, there may be justification to follow multiple pathways and/or combine them for better outcomes.

Pathway 1

Continue engaging with industry, suppliers, and relevant parties through forums and workshops to promote the advancement of VI controls, including proximity detection and collision avoidance controls.

Pathway 2

Legislate the implementation of proximity detection and collision avoidance technologies.

Pathway 3

Alter the roads and other vehicle operating areas requirements in legislation to include a requirement for consideration of the EMERST levels 1 through 9.

Pathway 4

Release a position paper detailing what the Regulator considers is reasonably practicable and conduct assessments and programs on the basis of this position.

Pathway 5

Develop a technical reference guide (TRG) for the requirements VI controls at mine sites as a guide to industry.

Feedback on potential Regulator position

The following positions have been proposed as possible compliance positions for the Regulator to address adverse VI in the NSW mining industry. These positions are not mutually exclusive, and depending on industry feedback, there may be justification to adopt a combination of these positions.

Position 1

It is reasonably practicable that mines assess the implementation of Proximity Detection and Collision Avoidance systems, conducting re-assessments as technology advances

Position 2

Mine operators should adopt the EMERST/ICMM model and methodology when developing, implementing, and maintaining vehicle interaction controls. It is reasonably practicable to integrate these models.

Position 3

The Regulator augment its current assessment structure for roads and other vehicle operating areas and include the EMERST Level 1 through 9 criteria as the basis for assessment. The Regulator would asses against the EMERST systems guidelines and monitor implementation of systems based on these criteria.

Important note

Regardless of the chosen pathway or position, the Regulator expects systems to be risk based and documented at mines and quarries as part of their safety management system. The adoption of reasonably practicable systems and/or technologies should lead to a reduction in adverse vehicle interactions. A comprehensive risk-based solution is likely to involve a combination of technologies and operator aids, taking into account factors such as equipment design, size, type, operational procedures, and the working environment.

Having your say

Industry organisations, operators, suppliers and individuals are encouraged to provide input to this process by making submissions through the following process:

Click here for online submissions

In writing:

Discussion paper – Vehicle interaction controls in NSW mines

NSW Resources Regulator

Department of Regional NSW

PO Box 344

HRMC NSW 2310

Submissions should be sent by 8 September 2023.