NSW GOVERNMENT

NSW Resources Regulator

PLANNED INSPECTION PROGRAM

CONSOLIDATED REPORT: ROADS OR OTHER VEHICLE OPERATING AREAS –SURFACE COAL MINES

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Contents

Executive summary

A crucial part of the NSW Resources Regulator's Incident Prevention Strategy involves targeted assessment and planned inspection programs for mines and petroleum sites. This is a focus on assessing an operation's control of critical risks through evaluating the effectiveness of control measures in the mine's safety management system.

To this end, we developed a bowtie hazard management framework and standardised assessment checklist for each program plan. Under each program plan, the effectiveness of the safety management system at each mine site is assessed against a standard set of control supports and critical controls.

This final report summarises assessment findings from 30 mines in relation to assessments for the principal hazard of roads or other vehicle operating areas, conducted during the period from March 2020 to April 2021. Please note this report is for the second stage of the inspection program which is associated with this principal hazard. The report for the first stage of the program was published in December 2020.

The threats and critical controls for the material unwanted event of surface vehicle interaction, are shown in Table 1. These are additional controls to what was assessed within the first stage of the program. Note that not all critical control supports were applicable at all mines.

Table 1: Threats and Critical Controls for the Material Unwanted Event –surface vehicle interaction

THREAT	CRITICAL CONTROL
■ Vehicles operating in close proximity ■ Environmental conditions ■ Component failure	PC 4.2 – Fit for purpose vehicles
■ Vehicles operating in close proximity ■ Human and organisational factors	PC 5.2 – Fit for work operator

Legislative requirements and published guidance relating to the principal hazard of roads or other vehicle operating areas is listed in Appendix A. Figure 1 presents safety compliance findings for each de-identified mine and critical control assessed for the material unwanted event of surface vehicle interaction. Explanatory notes on the assessment system are also listed in Appendix B.

Key Findings

Sixteen of the 30 mines that were subject to this planned inspection program could demonstrate that the critical controls assessed were documented and implemented effectively at their sites. Some key findings from this inspection program included:

- An increasing number of sites had introduced an electronic means of recording pre-operation inspections, which has providing successful results in the escalation and management of defects.
- Fatigue management strategies at some sites were well managed, with the use of in-cabin cameras being prevalent across truck fleets.
- Workers interviewed at some sites were identified as having a lack of awareness with regards to the employee assistance program (EAP). EAP services promote health and counselling for employees to support their well-being in the workplace.
- Mobile equipment inspected at some sites was found to be defective, yet these defects were not adequately addressed through the defect management system and pre-operation inspection process.
- Some sites were observed to not be effectively enforcing site road rules. Supervisors are reminded that they play an integral part of ensuring safe systems of work at the mine are understood and followed.
- Some sites had a rigorous fatigue management interaction process which is utilised and actioned appropriately.

Recommendations

Recommendations which are a result of the inspections conducted included:

- Ensuring that effective verification processes are in place to measure and monitor compliance with site procedures relating to fatigue. Sites with checklists and trigger action response plan (TARP) systems of work generally had a better understanding than those that have not implemented such a system.
- Ensuring equipment is fitted with original equipment manufacturer components. Where this is not possible or practical, an appropriate change management process should be conducted and a suitable alternative deemed safe to use.
- Ensure defects identified during pre-start inspections are correctly categorised and supervisors are informed of the defects in a timely manner to provide appropriate resources as necessary.
- Ensure that supervision arrangements are adequate so that work area inspections are detailed thoroughly and identify all reasonably foreseeable hazards.

It is recommended that mine operators review their site's respective risk assessment, principal hazard management plan, and associated documents to manage the risks pertinent to roads or other vehicle operating areas. During the review process, mine operators are encouraged to consider the above recommendations, as well as the guidance published within Appendix A.

Introduction

The NSW Resources Regulator's planned assessment programs provide a planned, risk-based and proactive approach to assessing how effective an operation is when it comes to controlling critical risk. These programs apply the following principles:

- a focus on managing prescribed 'principal hazards' from the Work Health and Safety (Mines & Petroleum Sites) Regulation 2014
- evaluation of the effectiveness of control measures implemented through an organisation's safety management system and
- consideration of the operation's risk profile.

The objective of risk profiling is to identify the inherent hazards and the hazard burden that exist at individual operations in each mining sector in NSW. The information is then used to develop the operational assessment and inspection plans that inform the program.

Scope

Planned inspection programs include two assessment types:

- targeted assessments, incorporating:
  - desktop assessment of:
    - compliance against legislation with respect to the management of health and safety risks associated with roads or other vehicle operating areas – see Appendix A for details
    - the definition of the controls the mine utilises to prevent and mitigate the risks to health and safety associated with roads or other vehicle operating areas.
  - a workplace assessment of the implementation of those controls through the inspection of plant and worker interviews.
- planned assessments, which involve a workplace assessment of the implementation of controls through the inspection of plant and worker interviews only.

The process

The process for undertaking an assessment under a planned inspection program generally involves the following stages:

- preliminary team meetings, preparation and review of documents
- execution of an on-site assessment involving:
  - an on-site desktop assessment of relevant plans and processes measuring legislative compliance of the relevant plans (targeted assessments only)
  - the inspection of relevant site operations (both targeted assessments and planned inspections).
- discussion and feedback to the mine management team on the findings and actions that need to be taken by the mine operators in response.

Assessment findings

Threats and Controls assessed

Threats:

- Vehicles operating in close proximity
- Environmental conditions
- Component failure.

Critical control: PC 4.2 – Fit for purpose vehicles

Control objective: Vehicles are able to safely carry out the functions they were designed to perform for the intended use, over the lifetime of the vehicles.

Performance requirement:

- A risk assessment identifies the risk of vehicle component failure.
- Procedures describe the identified vehicle component failure controls.
- Vehicles new to site are checked to make sure they are fit for the purpose they will be used for.
- Vehicles are used for tasks that are appropriate for the vehicle design.
- Features of a vehicle critical to its safe use are identified.
- Inspection, maintenance and testing identifies safety critical components that do not meet the established criteria.
- Risk management processes are applied to manage changes to vehicle configuration, using vehicles for purposes other than they were originally designed and for using vehicles beyond limits specified by the manufacturer.

Specific findings for this critical control included:

- The standard and use of pre-start inspections on mobile plant were generally found to be of a high standard. Some sites had a demonstrated knowledge of ‘safety critical items’ that

were being inspected and generally had well defined checklist systems (some electronic) that triaged hazards to control defect reporting.

- The implementation of an electronic recording system of the outcomes of pre-use inspections are showing improved results in the timely management of defects.
- Sites that had clear segregation of defects (safe/unsafe) generally had a better understanding from workers overall then those sites that had a checklist of defects all grouped together.
- Some vehicles were observed operating in excess of their design capabilities. It is imperative that mine operators provide supervision and training for workers on the limitations of heavy plant.
- The use of proximity detection and speed limitation engineering controls is becoming more widely adopted within industry.

Threats:

- Vehicles operating in close proximity
- Human and organisational factors.

Critical control: PC 5.2 – Fit for work operator

Control objective: Vehicle operators attend work physically and mentally capable of performing their duties and free from the influence of fatigue, alcohol and other drugs.

Performance requirement:

- A risk assessment identifies the risk of vehicles operating in close proximity to pedestrians, other vehicles and infrastructure.
- Procedures describe the identified operator fitness for work controls.
- Vehicle operators are physically capable of performing vehicle operating tasks.
- Vehicle operators are free from impairment caused by alcohol and other drugs.
- Vehicle operators are well rested and free from the effects of fatigue.
- Vehicle operators are aware of mental wellness issues and have access to support when suffering a mentally wellness issue.

- Vehicle operators are aware of fitness for work risks and the controls the site is using.
- Workers suffering from fitness for work related issues have access to support.

Specific findings for this critical control included:

- Workers interviewed at some sites were identified as having a lack of awareness with regards to the employee assistance program (EAP). EAP services promote health and provide counselling for employees to support their well-being in the workplace.
- Sites that had adopted fatigue management strategies for workers to use during their crib breaks had more engagement from the workforce than those that did not.
- Some sites have adopted a transport management plan which assists in managing fatigue for workers travelling to and from work.

Findings by mine

The figure below presents aggregate assessment findings by critical control, providing a summary view of the status of each mine's hazard management processes. Importantly, the system recognises the value of fully implemented and documented controls by awarding an additional point if both elements were assessed as present. More details explaining the assessment system are found at Appendix B.

Figure 1: Assessment findings for the planned inspection program – roads or other vehicle operating areas –surface coal mines – overall results < 100%

	Threat	
	2. Vehicles operating in close proximity 3. Environmental conditions 4. Component failure	2. Vehicles operating in close proximity 5. Human and organisational factors
	PC4.2	PC5.2
	Fit for purpose vehicles	Fit for work operators
Mine A	Yellow	Orange
Mine B	Yellow	Green
Mine C	Yellow	Green
Mine D	Yellow	Green
Mine E	Yellow	Yellow
Mine F	Yellow	Green
Mine G	Green	Yellow
Mine H	Green	Yellow
Mine I	Green	Yellow
Mine J	Yellow	Green
Mine K	Yellow	Green

Green (=100%)
Yellow (>= 80% and <100%)
Orange (>= 65% and <80%)
Red (<65%)

Figure 2: Assessment findings for the planned inspection program – roads or other vehicle operating areas –surface coal mines – overall results = 100%

	Threat	
	2. Vehicles operating in close proximity 3. Environmental conditions 4. Component failure	2. Vehicles operating in close proximity 5. Human and organisational factors
	PC4.2	PC5.2
	Fit for purpose vehicles	**Fit for work operators**
Mine L	●	●
Mine M	●	●
MIne N	●	●
Mine O	●	●
Mine P	●	●
Mine Q	●	●
Mine R	●	●
Mine S	●	●
Mine T	●	●
Mine U	●	●
Mine V	●	●
Mine W	●	●
Mine X	●	●
Mine Y	●	●
Mine Z	●	●
Mine AA	●	●
Mine AB	●	●
Mine AC	●	●
Mine AD	●	●

- Green (=100%)
- Yellow (>= 80% and <100%)
- Orange (>= 65% and <80%)
- Red (<65%)

Notices issued

Of the 30 mines assessed under the inspection program, 14 mines received notices relating to the principal hazard of roads or other vehicle operating areas, while some mines received notices in relation to other matters. For the purposes of this report, contraventions related to other matters have been removed from the analysis. The notices issued for roads or other vehicle operating areas were examined in detail and Table 2 below lists the notices issued by type and details.

Table 2: Notices issued for the planned inspection program – roads or other vehicle operating areas –surface coal mines

NOTICE TYPE	TOTAL ISSUED	NUMBER OF MINES
s.195 prohibition notice	-	-
s.191 improvement notice	6	6
s.23 notice of concerns	12	12
Total	**18**	**14**

Of the combined 18 notices issued, there were some common themes which were apparent throughout the program plan. Table 3 summarises the type of contraventions and also outlines the total occurrences encountered. These themes can be related back to the critical controls outlined earlier and identify some trends which are of concern.

Table 3: Notices issued - prevalence of categories of concern

IDENTIFIED CONCERN CATEGORY	TOTAL OCCURRENCES IN NOTICES
Workers observed to be non-compliant with the nominated controls on site	7
Training information for workers not clearly defined or detailed in relation to the hazard	5
Fatigue management controls (e.g. fatigue huts, sleeping accommodation, on-board fatigue management systems) is not readily available, maintained, fit for purpose, or located appropriately	4
Vehicles not fit for purpose	4
Pre-use inspection checklists did not accurately specify safety critical components of the vehicle	4
Poor standard of verifying compliance to nominated controls on site	3
Documentation relating to controls for roads or other vehicle operating areas (e.g. risk assessment, PHMP, TARPs) not relevant, current, or readily available	3
Reported defects not actioned or reviewed	2
Active roads and intersections were not constructed to site standard or design guidelines	2
Lack of controls to restrict unnecessary or unauthorised vehicles and persons from entering active production or work areas	2

Further information

For more information on safety assessment programs, the findings outlined in this report, or other mine safety information, please contact the NSW Resources Regulator:

CONTACT TYPE	CONTACT DETAILS
Email	cau@planning.nsw.gov.au
Incident reporting	To report an incident or injury call 1300 814 609 or log in to the Regulator Portal
Website	https://www.resourcesregulator.nsw.gov.au/
Address	NSW Resources Regulator 516 High Street Maitland NSW 2320

Appendix A. Legislative requirements and published guidance relating to the principal hazard roads or other vehicle operating areas

The following is a list of certain legislative requirements for the management of roads or other vehicle operating areas risks referred to in this report, as provided by the Work Health and Safety (Mines and Petroleum Sites) Regulation 2014 and Work Health and Safety Regulation 2017.

Work Health and Safety (Mines and Petroleum Sites) Regulation 2014:

- Clause 9 - Management of risks to health and safety
- Clause 28 – Movement of mobile plant
- Clause 43 – Fatigue
- Clause 103-108 - Information, training, and instruction.
- Schedule 1, Clause 4 – Roads or other vehicle operating areas
- Schedule 2, Clause 1 - Health control plan
- Schedule 2, Clause 2 – Mechanical engineering control plan.

Work Health and Safety Regulation 2017:

- Clause 36, Hierarchy of control measures
- Clause 37 – Maintenance of control measures
- Clause 39 – Provision of information, instruction and training.

Other published guidance:

- MDG 15 Guideline for mobile and transportable plant for use at mines
- MDG2007 Selection of collision management systems.

Appendix B. Assessment system explained

We use a bowtie framework to proactively assess how mine sites manage their principal hazards. Bowties are a widely used risk management tool that integrates preventative and mitigating controls onto threat lines that relate to a material unwanted event.

As part of program planning, controls were categorised in accordance with the ICMM handbook. Only controls deemed critical[1] are assessed under a planned inspection program. For a control to be assessed as effective, each of its control supports must be in place and operational.

Assessment findings results calculation

During the program, each control support assessed at each mine was rated and the findings recorded. Points were awarded depending on whether there was evidence that the control support had been documented and/or implemented. Importantly, the system recognises the value of fully implemented and documented controls by allocating four points if both these elements were present.

For finding outcomes, points were awarded for each control support identified within a critical control. An overall assessment result for the critical control was then calculated as a proportion of the maximum possible points for that critical control. For example, if a critical control comprises ten control supports and five were assessed as fully implemented (‘documented and implemented’) and five were found to be ‘not documented and not implemented’ then the overall assessment result for that critical control would be 50%.

Table 4: Finding outcome and points

FINDING OUTCOME	POINTS
Documented and implemented	4
Implemented but not documented	2
Documented but not implemented	1
Not documented and not implemented	0

Critical control calculations also took into account instances where control supports were not applicable to the mine being assessed or when control supports were not able to be assessed during a site visit.

[1] Critical Control Management Implementation Guide, International Council on Mining and Metals (ICMM), 2015.

The overall assessment result for each critical control has been assigned a colour based on the assessment bands presented in the table below. The colour band results are then used to identify industry focus areas requiring improvement.

Table 5: Assessment results and colour code

CRITERIA	COLOUR
An assessment result of 100% of possible points	Green
An assessment result of ≥ 80% but < 100% of possible points	Yellow
An assessment result of ≥ 65% but < 80% of possible points	Orange
An assessment result of < 65% of possible points	Red