

TARGETED ASSESSMENT PROGRAM

Consolidated report – Emergency management in NSW underground mines

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Executive summary

The targeted assessment program (TAP) commenced in March 2016 providing a planned, intelligence-driven and proactive approach to assessing how effectively mine operators are managing the principal hazards defined in the Work Health and Safety (Mines and Petroleum Sites) Regulation 2014 (WHS (M&PS) Regulation).

This interim report summarises the findings of assessments undertaken in relation to the mines' implementation of their emergency plan. These assessments were undertaken in the first half of 2017, and to date have been completed at six underground mines, three coal and three metalliferous mines.

The targeted assessment is an in-depth look at the control measures for emergency management and their implementation. The assessments are undertaken by a multi-disciplined team of Mine Safety inspectors using both desktop and on-site assessment.

The findings of the assessments are grouped into those that are specific to the principal control plan of emergency management, and those that could be generally applied to all aspects of critical control measure implementation.

General findings highlight that there is a need for mine operators to adequately assess risks, in the emergency response context, to determine effective controls that should be implemented. This is an essential part of the process in determining both adequacy and effectiveness of the emergency response arrangements. Mine operators are required to conduct consultation under clause 89 of the WHS (M&PS) Regulation. Some mine operators have not completed this adequately. This is an essential part of developing an effective and integrated emergency response capability.

Specific findings identified that some emergency response arrangements had not been established and maintained as required within the mine's emergency response management plan, including critical elements such as escape signage and lifelines, and testing of the emergency response arrangements. The management of hazardous chemicals at mining operations is generally inadequate. The assessments found that regulator notifications, site manifests, safety data sheets and emergency response arrangements, including adequate personal protective equipment (PPE), needed attention.

Targeted assessments are seen as a valuable process and a powerful analytical tool capable of identifying critical risk control issues not previously uncovered by conventional inspection regimes. This approach also highlights the benefits of using a multi-disciplined inspection team to identify issues across a range of areas through one activity.

Background

The targeted assessment program (TAP) provides a planned, intelligence-driven and proactive approach to assessing how effective an operation is when it comes to controlling critical risk. The TAPs apply the following principles:

- a focus on managing prescribed ‘principal hazards’ from the WHS (M&PS) Regulation.
- evaluation of the effectiveness of control measures implemented through an organisation’s safety management system
- consideration of the operation’s risk profile and the targeting of operations deemed to be highest risk.

The objective of the risk profiling is to identify the inherent hazards and the hazard burdens 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.

Each TAP is undertaken by a team of inspectors from various disciplines, such as electrical and mechanical engineering, who work together with the operation’s management team to undertake a thorough assessment of the control measures associated with the relevant hazard and their implementation.

Scope

Involving a multidisciplinary team of inspectors, the scope of the targeted assessment included two elements:

- a desktop assessment of:
 - compliance against legislation with respect to the emergency plan
 - adequacy of consultation with the primary emergency services in the area the mine is located
 - adequacy of the mine operators’ consideration and implementation of recommendations made by consulted emergency service organisations, in relation to:
 - the testing of the emergency plan, including the way in which it will be tested, the frequency of testing and whether or not the emergency service organisations will participate in the testing
 - what incidents or events at the mine should be reported to the emergency service organisations
 - adequacy of the number of people available to respond effectively to an emergency that are trained in the use of rescue equipment.
- a workplace assessment of the implementation of the emergency plan and adequacy of the emergency response.

The focus of the targeted assessment program was on the underground self-escape and rescue elements of the emergency plan, with the mine operator required to demonstrate how the risks have been assessed and the controls put in place to mitigate those risks in the emergency response context.

The process

The process for undertaking a TAP generally involves the following stages:

1. Preliminary team meetings and the preparation of documents.
2. Information and assessment requirements are discussed and supplied to the relevant mine.

3. Execution of a two-day on-site assessment involving:

- a site desktop assessment of all relevant plans and processes
- a discussion with the mine management team on the legislative compliance of the relevant plans
- the inspection of relevant site operations.

4. Discussion and feedback to the mine management team on the findings and actions that need to be taken by the operators in response.

Emergency management

Operators of mine or petroleum sites have a duty to prepare an emergency plan that addresses all aspects of the emergency response under the WHS (M&PS) Regulation. From 1 February 2017, operators must also comply with the emergency management provisions of the regulation.

Under the Work Health and Safety Regulation 2011 (WHS Regulation), a person conducting a business or undertaking at a workplace must prepare, maintain and implement an emergency plan for the workplace.¹

Operators of a mine or petroleum site are required to:

- prepare an emergency plan that addresses all aspects of the emergency response
- provide an appropriate means of escape from an underground mine in the case of an emergency evacuation²
- ensure that an adequate number of people, trained in the use of rescue equipment, are available to respond effectively to an emergency.³

Importantly, when developing the emergency plan, the WHS (M&PS) Regulation requires the operator of a coal mine or an underground mine to consult with the primary emergency services responsible for the area in which the mine is located, and the local authority in relation to principal hazards that may adversely affect the health and safety of persons in the area surrounding the mine. In the case of a coal mine, operators need to consult with all emergency service organisations (including NSW Mines Rescue Brigade established under the *Coal Industry Act 2001*) that may be required to participate in implementing the emergency plan. There are requirements for mine operators to consider aspects of recommendations made during the consultation process with emergency service organisations.

Additional emergency planning requirements exist for mine sites with hazardous chemicals that exceed the manifest quantities set out in Schedule 11 of the WHS Regulation.

It is recommended that operators refer to the [NSW Code of Practice - Emergency planning for mines](#) for guidance in relation to achieving legislative compliance of the emergency plan. The code refers to the required risk assessments and legislation and provides practical guidance in relation to achieving compliance including the requirements around consultation and testing of the emergency plan.

Operators should also refer to the [Mine sub plan](#), which is a sub plan of the NSW State emergency management plan. This plan clarifies how and when the state's emergency management arrangements apply in respect to emergencies at mines.

Finally, operators must ensure that their emergency plan addresses all requirements of Schedule 7 of the WHS (M&PS) Regulation.

¹ Clause 43 Work Health and Safety Regulation 2011

² Clauses 97(5) Work Health and Safety (Mines and Petroleum Sites) Regulation 2014

³ Clause 88(2)(iv) Work Health and Safety (Mines and Petroleum Sites) Regulation 2014

Assessment findings

The targeted assessment of emergency management risks highlighted some issues with the implementation of critical controls to manage the hazard, and more generally with the process of developing emergency management capabilities and reviewing controls. While the highlighted issues were not relevant at all of the sites assessed, the findings provide some valuable information which should be considered when developing critical controls.

The assessment process highlighted that:

- The risk assessment process for emergency management was generally inadequate for identifying, analysing and assessing the rescue, medical and fire-fighting capability required by the mine.
- Consultation with emergency service organisations with regard to the emergency plan was generally inadequate.

The findings of this assessment are grouped into two categories:

- **General findings** that can be used to inform all aspects of an operation’s safety management and provide valuable information and insight across all sectors and operation types.
- **Specific findings** should be used to inform and improve safety management systems to improve the emergency plan.

General findings

Areas of good practice

The assessment process revealed the following areas of good practice:

- Workers were aware of escape routes in underground mines and associated self-rescue equipment.
- The emergency response equipment installed in mines such as fire-fighting and first aid equipment was generally well maintained.

Risk assessments

Issue	Response
<p>The risk assessment for the emergency plan had not identified all the hazards associated with the mine e.g. the various types of fires that could occur.</p>	<p>Mine operators have a duty under clause 34 of the WHS Regulation to identify reasonably foreseeable hazards that could give rise to risks to health and safety and a duty under clause 9 of the WHS (M&PS) Regulation to conduct a risk assessment for each identified hazard.</p> <p>Mine operators must keep a record of each risk assessment and the control measures implemented to eliminate or minimise any risk that was identified through the risk assessment.</p>
<p>The risk assessment did not adequately identify the controls to eliminate or</p>	<p>As above. In addition the provision of rescue equipment for use in emergencies may require specific training for both the general use of the particular equipment and the use of the equipment for emergency related</p>

minimise the risks to health and safety related to emergency scenarios at the mine site e.g. the provision of adequate rescue equipment; adequate number of workers trained in the use of emergency equipment who are able to respond effectively to an emergency.

tasks (i.e. general tools). This is particularly important where items such as airbags and other lifting equipment are installed.

Mine operator had not undertaken a risk assessment to determine if self-contained self-rescuers should be provided to persons who go underground at the mine.

Mine operators must conduct a risk assessment to determine whether self-contained self-rescuers should be provided to any person who is to go underground at the mine in accordance with clause 100(6) of the WHS (M&PS) Regulation.

Consultation

Issue	Response
<p>Mine operators had not consulted with the primary emergency services in the area.</p>	<p>When preparing the emergency plan, a mine operator must, so far as is reasonably practicable, consult with the primary emergency services with responsibility for the area in which the mine is located in accordance with Clause 89(1) of the WHS (M&PS) Regulation.</p>
<p>Mine operators had not included the recommendations made by the emergency service organisations in the emergency plan.</p>	<p>In accordance with Clause 89(2) of the WHS (M&PS) Regulation, operators must ensure that the emergency plan addresses any recommendation made by the emergency service organisations consulted in relation to:</p> <ul style="list-style-type: none"> • the testing of the emergency plan, including the way in which it will be tested • the frequency of testing and whether or not the emergency service organisations will participate in the testing • what incidents or events at the mine should be reported to the emergency service organisations.

Specific findings

Testing of the emergency plan

Issue	Response
The emergency plan was not being tested every 12 months.	The emergency plan must be tested at intervals of no more than 12 months and as soon as is reasonably practicable after there has been a significant revision to the plan in accordance with Clause 93 of the WHS (M&PS) Regulation.

Hazardous chemicals

Issue	Response
Mine operators did not have an accurate manifest of hazardous chemicals and consequently had exceeded the manifest quantities specified in Schedule 11 WHS Regulation hazardous chemicals.	<p>In accordance with Clause 347 of the WHS Regulation mine operators must prepare a manifest of Schedule 11 hazardous chemicals, and amend the manifest as soon as practicable if:</p> <ul style="list-style-type: none"> the type or quantity of those hazardous chemicals or group of hazardous chemicals changes or there is a significant change in the information required to be recorded in the manifest. <p>The manifest must be kept at a place determined in agreement with the primary emergency service organisation, and be readily accessible to emergency services.</p>
Mine operators had not notified the regulator of Schedule 11 hazardous chemicals exceeding the manifest quantities, or a significant change in the risk of storing the hazardous chemicals.	<p>Mine operators must ensure that the regulator is given written notice if a quantity of a Schedule 11 hazardous chemical or group of Schedule 11 hazardous chemicals exceeds the manifest quantity and is or is to be used, handled or stored at the mine (Clause 348 WHS Regulation). The notice must be given immediately after the operator knows that there will be a significant change in the risk of using, handling or storing the Schedule 11 hazardous chemical or group of Schedule 11 hazardous chemicals at the mine or at least 14 days before that change (whichever is earlier).</p> <p>Notifications and updates should be made via the SafeWork NSW Hazardous Chemicals notification portal on the website. This information is supplied by Safework NSW to the Resources Regulator.</p>
Operators had not provided a copy of the emergency plan to primary emergency service organisations with regard to the Schedule 11 hazardous chemicals exceeding the manifest	If the quantity of a Schedule 11 hazardous chemical used, handled, generated or stored at a workplace exceeds the manifest quantity for that hazardous chemical, the operator must give a copy of the emergency plan for the mine to the primary emergency service organisation in accordance with Clause 361 of the WHS Regulation. If the primary emergency service organisation gives the operator a written recommendation about the content or effectiveness of the emergency

quantities for that hazardous chemical.

plan, the operator must revise the plan in accordance with the recommendation.

The primary emergency service organisation for this provision is Fire Rescue NSW.

Emergency exits and lifeline standards

Issue	Response
<p>Emergency exits were not adequately marked or signposted so that they could be readily located in an emergency.</p>	<p>Mine operators must ensure that each emergency exit is marked or signposted so that it can be readily located in an emergency, and be maintained so that it remains effective (Clause 96(2) WHS (M&PS) Regulation). Mine operators must ensure that the marking of exit paths is such that persons can, so far as is reasonably practicable, safely travel on them in an emergency including through conditions of reduced visibility or irrespirable or unsafe atmospheres (Clause 96(5)(d) WHS (M&PS) Regulation).</p>
<p>Lifelines installed in the mine were not maintained to be compliant with the operator's documented lifeline standards.</p>	<p>Mine operators should ensure that all lifelines are compliant with the operator's established standards, which are effective and appropriate for their particular site.</p>

Firefighting PPE

Issue	Response
<p>Adequate consideration of appropriate protective clothing for workers required to perform fire-fighting activities, particularly tasks beyond an initial response, was not conducted.</p>	<p>Mine operators must ensure that adequate personal protective equipment is provided to workers in accordance with the work carried out (Clause 44 WHS Regulation). Fire-fighting strategies and activities must be assessed to determine not only the equipment and skills required, but the potential risks to persons and standard of personal protective equipment required for the task.</p>

Where to now

Targeted assessments provide an account of the issues observed at particular sites at a particular time. Some of the findings resulted in notices being issued, including notices of concern, under section 23 of the WHS (M&PS) Act, and improvement notices, under section 191 of the WHS Act.

The matters addressed by the notices reflect the findings of the Mine Safety inspectors. In summary, these findings are:

Notice	In relation to
Improvement notices, s 191	<ul style="list-style-type: none"> • emergency exits and self-rescuers • provision of adequate rescue equipment and training of persons in the use of rescue equipment • hazardous chemicals exceeding manifest quantity and failure to notify regulator and Fire Rescue NSW • maintaining hazardous chemicals registers, manifests and Safety Data Sheets (SDS). • risk assessment to identify the appropriate self-rescue unit • consultation with primary emergency service organisations • testing of the emergency plan • risk assessment and supply of adequate PPE for fire-fighting • risk assessment and establishing effective fire-fighting capabilities and strategies for sites with hazardous chemicals • risk assessment and supply of adequate PPE for hazardous chemical incidents • assessment and determination of adequate first aid provisions • rehydration provisions for workers during self escape
Notices of concern, s 23	<ul style="list-style-type: none"> • risk assessment for the development of the emergency plan • use of semi-rigid (stiff neck) cervical collars (see ANZCOR Guideline 9.1.6) • risk assessment to identify all hazards, including various types of fires • location of firefighting equipment • accessibility of fire hydrants • signage for waste oil storage

All mine operators involved in this targeted assessment have indicated that they would respond to the notices and other issues identified through the inspections. Where significant issues were identified, these will be followed up with the individual mines.

The TAP process identified many common issues around the approach taken by the sites regarding emergency response and emergency management. It also highlighted broader issues that are common across

mine sites associated with the process of developing, implementing and reviewing the risk assessments, management plans and procedures.

This assessment program will continue into 2018, examining emergency management arrangements in underground mines in both the coal and metalliferous sectors.

The regulator expects that all underground mines will review their procedures and practices in consideration of the findings of this summary.

Issued by

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Further information

For more information on targeted assessment programs, the findings outlined in this report, or other mine safety information, please contact the Resources Regulator’s Mine Safety branch. You can find the relevant contact details below.

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Email	mine.safety@industry.nsw.gov.au
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Address	Resources Regulator, Mine Safety 516 High Street Maitland NSW 2320

Appendix A: Legislative requirements relating to emergency management

The appendix provides a list of certain legislative requirements for to emergency management referred to in this report as provided by the *Work Health and Safety (Mines and Petroleum Sites) Act 2013*, *Work Health and Safety (Mines and Petroleum Sites) Regulation 2014* and *Work Health and Safety Regulation 2011*.

Legislation, section/clause	Legislative requirements
WHS (M&PS) Regulation, clause 9	Management of risks to health and safety
WHS (M&PS) Regulation, clause 88	Duty to prepare emergency plan
WHS (M&PS) Regulation, clause 89	Consultation in preparation of emergency plan
WHS (M&PS) Regulation, clause 93	Testing of emergency plan
WHS (M&PS) Regulation, clause 96	Emergency exits
WHS (M&PS) Regulation, clause 97	Safe escape and refuge
WHS (M&PS) Regulation, clause 100	Self-rescuers
WHS Regulation, clause 34	Duty to identify hazards
WHS Regulation, clause 43	Duty to prepare, maintain and implement emergency plan
WHS Regulation, clause 347	Manifest of hazardous chemicals
WHS Regulation, clause 348	Regulator must be notified if manifest quantities to be exceeded
WHS Regulation, clause 361	Emergency plans