

Consolidated report

Emergency first response – coal mines above surface

November 2021 to December 2022



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Executive summary

A crucial part of the NSW Resources Regulator's Incident Prevention Strategy for mines and petroleum sites involves:

- targeted assessments and planned inspection programs - focusing on assessing an operation's control of critical risks through evaluating the effectiveness of control measures in the mine's safety management system.
- priority programs - proactively assessing a topic that is an emerging risk across the industry, that is driven primarily from incident data as well as evolving industry trends. Although these topics may also be contained within the Regulator's planned inspection programs, the aim of compliance priority programs is to gather further information and knowledge about how the industry is managing and controlling a specific issue.

This report summarises the planned inspection program assessment findings from 16 mines in relation to assessments for the emergency first response – coal mines above surface, conducted between November 2021 and December 2022. As a result of the assessment program there were 16 notices issued to 8 surface coal mines.

Background

All mines are required to have an emergency plan. The plan is a principal control plan under the Work Health and Safety (Mines and Petroleum Sites) Regulation 2022 (Division 7 Emergency management) and forms part of the safety management system of the mine. The plan must include emergency procedures, consultation in preparation of the plan, implementation of the plan, resources, testing and review of the plan and training workers.

The emergency plan must be used as the primary means of response. This response is based on being prepared and being able to respond in order to reinstate safe operations for people working in the mine.

Lessons learned from past mine emergencies have highlighted the need to establish and maintain relationships between the mine operators and emergency services. Some mines are required to carry out consultation with emergency services and others in the preparation of their emergency plan and the arrangements around testing the plan.

The Regulator has developed a planned inspection program targeting specific criteria related to emergency first response at surface coal mines.

Legislative requirements and published guidance relating to emergency first response is listed in Appendix A. Explanatory notes on the assessment system are also listed in Appendix B.

Scope

An emergency is defined by the Regulator as due to an actual or imminent occurrence, such as fire, explosion, accident or flooding that has resulted in the death of, or injury to, a person, or is endangering or threatening to endanger the life or physical well-being of a person at a mine.

The scope of the Regulator's planned inspection program for emergency first response at surface coal mines is grouped into 4 assessment criteria groups:

- prevention
- preparedness
- response
- recovery

Objective

The intent of the planned inspection program was to determine the suitability of the emergency response control plan for the potential emergencies the mine has identified, the effectiveness of the plan implementation and the compliance of the mine with emergency management-related legislative requirements.

Assessment criteria

The Regulator’s assessment consisted of 14 criteria questions grouped into 4 criteria groups as shown in Figure 1.

Figure 1: Planned inspection program surface coal mines – criteria groups for emergency first response

Criteria group	Criteria number	Criteria
Preparation	1	A suitable and effective assessment of other PHMP that identify the emergency plan or a support plan to the emergency plan has been carried out.
	2	Identifying potential incidents not detailed in a PHMP that may require activating the emergency plan.
	8	Adequate numbers of workers have been identified (How - risk assessment) to form part of the onsite EM response team to ensure coverage for the duration of emergency operations.
	9	A schedule of training requirements, skills, competencies and qualifications (needs analysis) and a skills maintenance/exercising program for response crews is has been developed. <ul style="list-style-type: none"> • Firefighting • Rescue (GLR, RCR, Vertical, Aquatic) • First Aid • Explosives • Hazmat (if applicable)
	10	Have triggers been identified to have emergency services attend an incident?
Planning	3	Response arrangements (controls) for different emergency assumptions are identified?
	4	Testing - How have you tested each TARP/PIP to ensure it is adequate. When was the plan last tested? (Response teams and/or IMT) <ul style="list-style-type: none"> • with emergency service agencies • to a level that exceeded the mine’s capacity (as per sub plan to activate EMPLAN is there anything in SERM to compel a mine to activate subplan? • desktop or scenario What did the tests conducted in previous years involve? How was this method selected?
	5	Training, has been developed, implemented, carried out or obtained for likely incidents for an ERT member and general workforce,
	6	Equipment and PPE has been obtained fire, first aid, Hazchem, rescue, explosives incidents Maintenance and servicing arrangements are documented and implemented
	7	Consultation preparing plan

Criteria group	Criteria number	Criteria
Response	11	What systems are in place to notify emergency teams of an incident and what arrangements are in place to transport teams and equipment to the incident?
	12	What arrangements are in place for an escalating the situation to integrate with or handover to emergency services (and when has this arrangement been tested **NOT in regard to an IMT, that is a separate inspection)?
Recovery	13	What type of review of emergency response is carried out following activation of the emergency plan or publication of incident reports by the Regulator?
	14	What changes to the plan, training, equipment, or procedures have occurred as a result of this (after action review/lessons learned/continuous improvement).

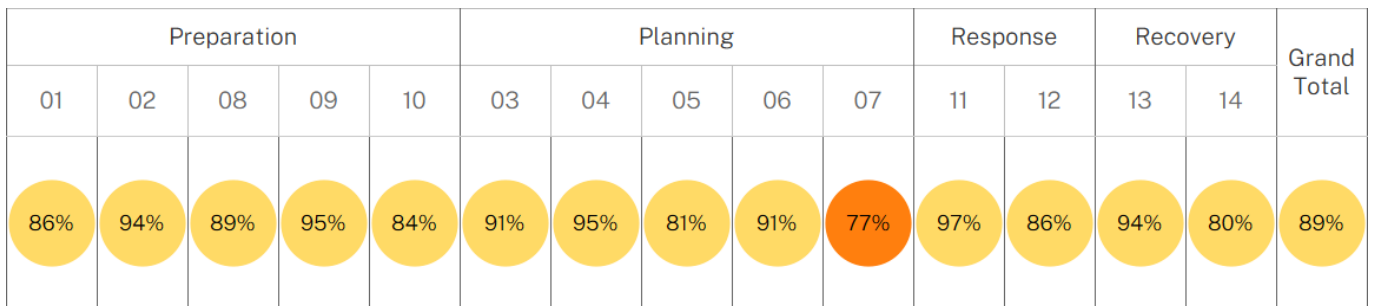
Planned inspection program assessment findings

An overall summary of the assessment findings for 14 criteria questions in 4 criteria groups is shown in Figure 2.

On average, the assessment findings range from 80 to 100% level of compliance for 13 of the 14 assessed criteria questions.

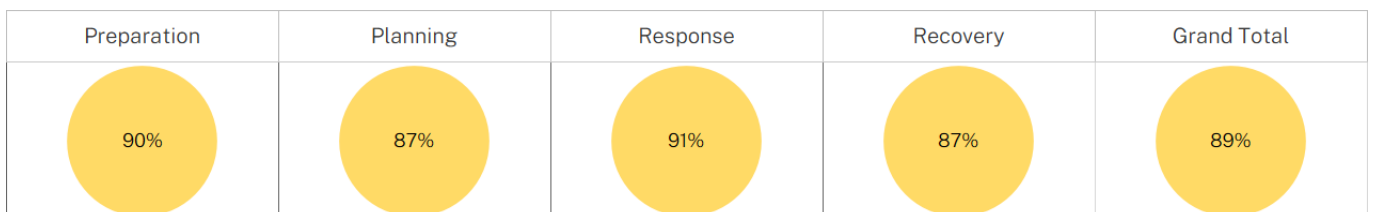
The lowest scored criteria question was in the ‘planning’ criteria group and criteria question number 07 (Consultation preparing plan) and was assessed with compliance of 77%.

Figure 2: Summary of assessment criteria compliance – 14 criteria questions for emergency first response



The overall level of compliance of the 4 criteria groups was 89% for the 14 assessed criteria questions as shown in Figure 3.

Figure 3: Summary of assessment criteria compliance – 4 criteria groups for emergency first response

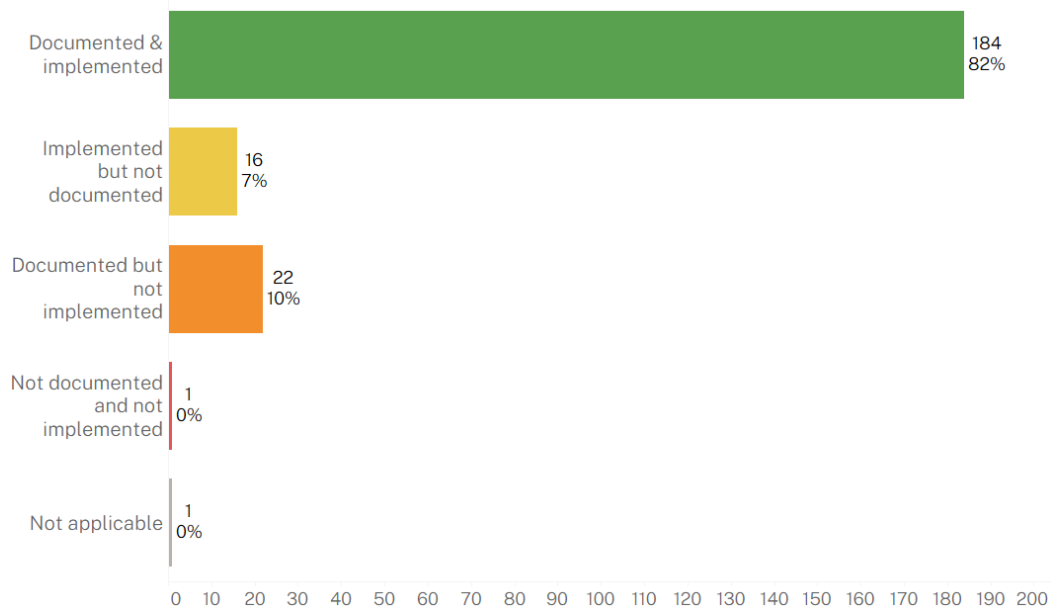


- Green (=100%)
- Yellow (>= 80% and <100%)
- Orange (>= 65% and <80%)
- Red (<65%)

Key findings

The overall assessment findings ratings were 82% of the criteria were documented and implemented and shown in Figure 4:

Figure 4: Assessment findings – documented and implemented ratings



Key findings of the assessment program are summarised for each of the 4 criteria groups:

Prevention

- Employee skills not kept current.
- Emergency response equipment maintenance not completed to site standards.
- Equipment stored unrestrained.
- Emergency plans lacking detail.

Preparedness

- Consultation with emergency services not carried out.
- Frequency and method of testing of the emergency plan inadequate.
- Response arrangements for all identified emergencies (found in other RA and PHPs) not detailed.
- Rationale of numbers of ERT members unable to be explained or validated.

Response

- Incidents to be notified to external services not detailed.
- Inadequate guidance when below minimum ERT members unavailable on site.

Recovery

- Recommendations from debriefs not acknowledged or implemented in review of emergency response plans.

Notices issued

Of the 16 sites assessed under the inspection program, 8 separate mines were given notices relating to emergency first response, while some mines were given notices in relation to other matters. For the purposes of this report, contraventions related to other matters were removed from the analysis. The notices issued for emergency first response were examined in detail and Table 5 lists the notices issued by type and details.

Table 5: Notices issued for the planned inspection program –emergency first response – coal mines above surface

NOTICE TYPE	TOTAL ISSUED	NUMBER OF MINES
s.195 prohibition notice	-	-
s.191 improvement notice	9	6
s.23 notice of concerns	7	6
Total	16	8

Of the combined 16 notices issued, there were some common themes that were apparent throughout the program plan. Table 6 summarises the type of contraventions.

The themes can be related to the criteria questions and identify some trends of concern.

Table 6: Notices issued - prevalence of categories of concern

IDENTIFIED CONCERN CATEGORY
Emergency plans did not contain all the elements identified in Sch 7 of the Regulations.
Consultation with emergency services not carried out that identified the way in which the emergency plan will be tested or what incidents the agencies are to be notified.
Response equipment was not tested or maintained in accordance with documented standards.
Training that was identified as essential was not carried out or refreshed in the required timeframes.

Recommendations

Mine operators should consider the following recommendations:

Prevention

- Training and skills maintenance systems must be able to easily identify workers with expired essential skills.
- Mine operators to determine the minimum numbers of ERT and first aid trained workers overall and per shift.
- Audit and dip sampling of emergency response and first aid equipment to ensure that servicing, replenishment and maintenance is carried out to the required standards.
- Review legislation and published guidance material from the Regulator to ensure the emergency plan covers all elements of Schedule 7 and details the arrangements for all identified scenarios.

Preparedness

- Mine operators to actively engage with emergency service organisations to ensure adequate and ongoing consultation occurs to enable a shared understanding of site risks and hazards, assumptions made in the development of the emergency plan as well as on site and agency capability.

- Emergency plans to be tested at least once every 12 months to identify limitations of site capability.
- Emergency plans to meet all requirements of legislation and be based upon site specific risks and hazards.

Response

- Mine operators to provide timely notifications of incidents to external agencies as per consultation and legislation (WHS Reg Cl 43 (1,iii).
- Ongoing recruitment and development of ERT members to ensure adequate availability.
- Adequate numbers of first aid and ERT trained workers must be maintained across all shifts at the mine.

Recovery

- Review of emergency plan to include analysis of previous incident and investigation recommendations.

Further information

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

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

Appendix A. Legislative requirements and published guidance relating to emergency first response

The following is a list of legislative requirements for the management of emergency first response referred to in this report, as provided by the Work Health and Safety (Mines and Petroleum Sites) Regulation 2022 and Work Health and Safety Regulation 2017.

- NSW Resources Regulator published fact sheet - Consultation requirements for mines in emergency planning
- NSW Resources Regulator published fact sheet - Incident notification requirements for mines in emergency planning
- Code of practice – Emergency planning for mines
- Code of practice – First aid in the workplace
- Code of practice – Managing risks of hazardous chemicals in the workplace
- Code of practice – Chemicals of security concern
- AS 3745 - Planning for emergencies in facilities
- Fire and Rescue NSW – Emergency plan requirements
- NSW State Emergency Management Plan
- NSW Mine Sub Plan
- WHS Regulation 2017 cl43, cl341-350, cl359-366, Sch 11, 12 & 13
- WHS (M&P) Regulation s91-s105, [Sch 7](#)
- NSW State Emergency & Rescue Management Act

Appendix B. Assessment system explained

The Regulator uses 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 by the Regulator’s mine safety inspectorate in accordance with the ICMM handbook. Only controls deemed critical¹ 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 1: 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.

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 2: Assessment results and colour code

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

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