



# SAFETY BULLETIN

## Underground bolting rig injuries

### Background

NSW Mine Safety engaged a mechanical engineering consultant to review the number of injuries that have occurred as a result of roof bolting in underground coal mines.

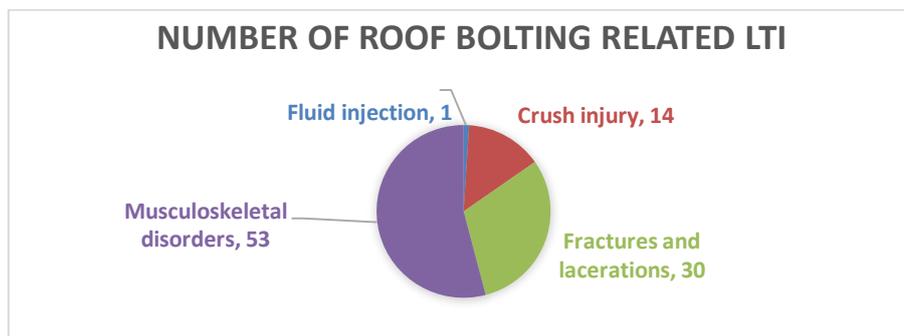
The report is available on the [website](#).

### Key findings

The report identified that the number of injuries as a result of roof bolting continued to rise. There were 98 related roof bolting injuries between 2009 and 2015 that resulted in workers being hospitalised or certified unfit for work for seven days or more.

Key aspects of the report include:

- the two types of roof bolting-related injuries:
  - incidents related to musculoskeletal disorders, ergonomics and slips, trips and falls and
  - injuries related to moving equipment.
- musculoskeletal disorders (42%) and slip, trips and falls account for the majority of reported injuries
- that there was clear indication that operator entanglement with moving components, including roof and rib falls, had reduced by 20%. This may be considered largely attributable to the introduction of MDG35.1
- that there continued to be a high number of reported fluid escape roof bolting-related incidents, with general supply hose failures shown to contribute the highest number of injuries in this category
- that all crush injuries reported occurred on a continuous miner and required hospitalisation with all injured workers being certified unfit for work for seven days or more.



## RECOMMENDATIONS

Please see the [report](#) for a list of all recommendations.

1. Improved consultation needs to occur between mine operators and manufacturers of drilling and bolting equipment, with design consideration given to:
  - pinch points
  - roof bolt ergonomics and lay out
  - drill feed vs speed vs pressure feedback/ proportioning system for varying roof conditions
  - hydraulic control valve design being consistent with the recommendations in MDG 35.1
  - access and egress to bolting rig equipment.
2. Provision of training to drill operators should include:
  - fluid injection hazard awareness
  - mega and flexi bolting and material handling
  - hazard awareness in around roof and rib bolting
  - safe operating procedures, including those procedures to recover when things go wrong, such as blocked drill steel
3. Training related to hazardous manual tasks and roof bolting should use a participatory ergonomics approach
4. Review bolting rigs to check for safety improvements against the latest industry designs and standards
5. Minimise exposure to hazardous manual tasks throughout the shift by regularly rotating people or equipment
6. Improve the quality of materials supplied, e.g. the surface quality finish of bolts so that potential for burring and splintering to operators is minimised.
7. Review isolation of power on task procedures and ensure operators are competent in those procedures.
8. Carrying out a bolting procedure (map) review.
9. Carry out bolting operational risk assessments (refer MDG35.1)
  - Ensure the hierarchy of controls are applied
  - Consider equipment that can reduce manual interaction with the mine environment.

10. Extensive maintenance inspection regimes should include drill guides, OEM recommendations and hose layout protection systems to minimise potential of hoses rubbing.

## Strategies

To assist industry on the path of continuous improvement, Mine Safety is facilitating a number of end user-focused roof bolting workshops in March 2016.

The dates of the workshops are:

- 16 March, Rutherford,
- 22 March, Lithgow
- 23 March, Wollongong.

Mine management is encouraged to send experienced supervisors, operators and engineering-related personnel associated with underground bolting. For more information on the roof bolting workshops go to the events page on the department's [website](#).

Mine Safety will also hold a roof bolting industry roundtable focusing on new technology, safety design, and automation. Dates and locations are to be confirmed.

## References:

- [HMS Consultants, Australia NSW Mine Workplace Agreed Undertaking- review of Mobile roof bolting machines project report, May 2014](#)
- [MDG 35.1 Bolting and drilling plant in mines](#)

**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 notice board.

## Issued by

**Gary Parker**

**Chief Inspector of Mines**

**Appointed pursuant to Work Health & Safety (Mines) Act 2013**

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