



# SAFETY ALERT

## Drill Rigs and Serious Injuries

### INCIDENT

A number of serious drill rig injuries have recently occurred at underground mines resulting in fractures, amputation of fingers, severe soft tissue damage, nerve damage, crush injuries, lacerations and strain.

### CIRCUMSTANCES

Most of the drill rig incidents involved one of the following:

- Interaction of part of the individual's body with the moving drill rig.
- Strain due to the load placed on the individual's body.
- Fall of roof or rib.

### INVESTIGATION

A total of 747 injuries involving roof and rib bolting were recorded by Coal Mines Insurance NSW for 1999 to 2004 inclusive. In excess of 250 of these involved machine mounted bolting rigs.

Issues which contributed to interaction accidents include:

- Accidental movement of controls by bumping or contact with cap lamp cord.
- Operator moving controls intentionally without realising part of his body would be injured.
- Moving the wrong control.
- One person operating controls whilst another person is at risk.
- The unplanned movement of equipment.
- The high degree of interaction required between the moving drill rig and the operator.
- The high speed of some of the motions of the drill rig.
- Bent or broken drill rod.

Some of the factors which contributed to strain injuries include:

- Dolly stuck in chuck.
- Drill steel stuck in chuck.
- Drill steel stuck in hole.
- Ergonomics of machine.

## RECOMMENDATIONS

Use appropriate Risk Management Process for drilling/bolting operations. Systems of work employed in providing rib and roof support must utilise fit for purpose equipment to provide a safe workplace. As far as practical comply with the intent of Australian Standard AS4024.1 'Safeguarding of machinery – General Principles'.

This standard is not confined to physical guards it includes other methods of minimising or eliminating hazards and risk such as:

- 2 handed control;
- reduced speed when using one handed control;
- minimising nip and pinch points, self clearing mechanisms and use of non metallic pliable material;
- Guarding controls or other means of reducing the risk of inadvertent operation;
- using different physical shapes for different controls;
- standardising control layouts;
- Interlocked sensing of a persons body so the rig is prevented from operating when a dangerous situation exists;
- reducing the need for some of the interaction between the operator and the moving rig; and
- Automatic drill thrust and penetration rate control to minimise drill rods bending/breaking/becoming jammed.

Improve the design and maintenance of the following:

- drill chucks;
- drill rod drive shanks;
- dolly ends or eliminate the dolly;
- drill rig supports so drills do not jam;
- water pressure/volume is maintained above a minimum; and
- ergonomic aspects of the work area and drill rig. Need to minimal load on shoulder.

Minimise the reliance on safe systems of work by giving preference to engineering solutions. Provide adequate protection from roof and rib falls for drill rig operators by applying temporary supports or other safeguards prior to commencement of drilling.

**NOTE:** Industry guideline MDG 35 covering drilling/bolting equipment will be released for public comment this year.



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