

SAFETY ALERT

Miner's arm injured using drill rig

INCIDENT

A miner suffered serious injuries to his left arm when it became entangled in steel rib mesh and a rotating drill steel. The miner's lower left forearm was later amputated while in hospital.



The drill steel, drill bit and entangled rib mesh

CIRCUMSTANCES

Initial investigations revealed that the injured miner's left arm became entangled in steel rib mesh and a drill steel. The continuous miner-mounted hydraulic roof bolter may have been inadvertently operated by the operator, or it may have inadvertently operated independent of the operator.

At the time of the incident the process being undertaken was to locate the roof mesh and the horizontal section of the rib mesh on top of the continuous miner-mounted temporary roof support, using the left and right hand drill steels as guides. This step was in preparation for the continuous miner to be trammed forward for the next roof support cycle.

The 1.3 metre drill steel located in the right hand outer drill rig was fitted with a butterfly drill bit. The rib mesh caught between the twin tips of the drill bit, causing the rib mesh to wrap around the drill steel when it was rotated. The injured miner had his left hand in close proximity to the rib mesh and drill steel at the time of the incident.

INVESTIGATION

This incident is being investigated by the NSW DPI Investigation Unit.

RECOMMENDATIONS

- a) **Employers and mine operators** are reminded of their OHS obligation under clause 136(3)(d) of the *Occupational Health and Safety Regulation 2001 (OHS Regulation)* which requires that:

'persons do not operate, or pass in close proximity to, the plant unless the risk of entanglement is controlled by guarding that meets the requirements of clause 90(1) or the use of safe systems of work'

- b) **Employers and mine operators** are also reminded of their OHS obligations under Chapter 2 of the OHS Regulation, which requires an employer to: identify hazards; assess risks; eliminate risks; review risk assessments and control measures; and provide instruction, training and information
- c) Clause 5 of OHS Regulation requires risks to be minimised to the lowest level reasonably practicable and controlled in a hierarchal order which requires engineering means to control risks in preference to safe work practices
- d) **Designers** are reminded of their OHS obligations under Chapter 5, Part 5.2, Division 1 '*Design of Plant*' of the OHS Regulation, which requires a designer to: identify hazards; assess risks; eliminate risks; review risk assessments; control risks; provide particular risk control measures in relation to guarding, operational controls, and emergency stops; specify working systems and operator competencies; provide and obtain information
- e) In accordance with Clause 12 of the OHS Regulation all **mine operators** should review their risk assessments for the installation of rib and roof mesh support systems to ensure that people are prevented from becoming entangled in either the mesh or the drilling plant.

This risk review should be undertaken in consultation with the drilling plant designers and manufacturers, supervisors and drilling rig operators and the risk review should consider:

- (i) the relevant obligations in the OHS Regulation
- (ii) the relevant requirements in Australian Standard *AS 4024.1:2006 (Series), Safety of Machinery*
- (iii) the relevant sections in *MDG 35.1 Guideline for bolting and drilling equipment mines, Part 1: Bolting equipment in underground coal mines – DRAFT*,
- (iv) persons involved with the installation of roof and/or rib mesh being made aware of the risk of:
 - drill rigs being operated inadvertently by operators, or inadvertently operating of their own accord
 - placing hands in contact with roof or rib mesh while there is a risk that the mesh may become entangled by a rotating drill steel
 - placing hands on rotating and sliding parts of the drill rig
- (v) current safe work practices in drilling and bolting operations

- (vi) mine standards for drilling equipment when it is being overhauled.
- f) In accordance with Clause 88 of the OHS Regulation **all designers**, should review their design risk assessments for the operation of drilling and bolting plant to ensure that people are prevented from becoming entangled. The risk review should consider:
- (i) the relevant obligations in the OHS Regulation
 - (ii) the relevant requirements in Australian Standard *AS 4024.1:2006 (Series), Safety of Machinery*
 - (iii) ensuring that the action of one of the operator's hands should not be able to injure the other hand, particularly with machine motions that operate at full speed
 - (iv) the relevant sections in *MDG 35.1, Guideline for bolting and drilling equipment mines, Part 1: Bolting equipment in underground coal mines – DRAFT*, including an appropriate combination of the following risk controls:
 - Rotation and drill feed manual controls being separated from each other such that these controls can not be operated simultaneously by one hand
 - Two-handed operation of primary manual controls being used to operate all drilling and bolting functions at normal operating speeds, unless the function is guarded in accordance with the requirements of AS 4024
 - Where one-handed manual operation of primary controls is used all drilling and bolting functions shall be limited to slow speed operation, with the exception of the rotation function.
 Note: The rotation function at full speed shall not be able to be operated by one-handed manual control unless guarded in accordance with AS 4024
 - The handles of primary bolting controls on bolting rigs should be individually shaped in accordance with the following:
 - rotation-three balls in line
 - feed control - round disk
 - timber jack – rectangle.
 Note: This is to allow different function to be able to be identified by feel, even when wearing gloves
- Ensure control handles are adequately guarded and sufficiently separated to prevent inadvertent operation.

NOTE: Please ensure all relevant people in your organisation receive a copy of this Safety Alert, and are informed of its content and recommendations. This Safety Alert 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.

Signed

A handwritten signature in black ink, appearing to read 'Rob Regan', written in a cursive style.

**Rob Regan
DIRECTOR
MINE SAFETY OPERATIONS BRANCH
NSW DEPARTMENT OF PRIMARY INDUSTRIES**

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