DEPARTMENT OF MINERALS AND ENERGY WESTERN AUSTRALIA

S A F E T Y B U L L E T I N No. 47

ROCKFALL – DANGEROUS OCCURRENCE – POTENTIAL SERIOUS INJURY

Incident:

Following blasting operations in a 4.5 metre x 4.5 metre ore drive, hand scaling operations were undertaken from the top of the broken material under the unsupported ground created by the blast. Shortly after scaling operations were completed a rock wedge weighing approximately 5.4 tonnes and measuring 1.5 metres long x 4.2 metres wide x 0.6 metres thick fell from the back under gravity.

The rock fell approximately 1.5 metres beyond the last row of ground support, and the distance from the ground support to the face was approximately 5.0 metres. The drive up to the unsupported area was fully bolted and meshed, and smooth wall blasting techniques were being employed in the drive.

No person was injured.

Contributing Factors:

The rock fell from a blocky dolerite rock mass. The discontinuities (structures) which formed the wedge had rough stepped planes. Lack of access after the fall prevented measurement of the orientation of the structures.

The number of structures and their unfavourable orientation with respect to the drive back were major factors in the fall. The weight of the wedge was greater than the shear strength of the discontinuities, allowing the block to fall.

The block fell from a large unsupported area which was exposed after the last round was blasted.

Comments and Recommendations:

The risk of rockfalls in unsupported ground is always present, even with good blasting practices being employed.

Therefore it is important that the operator is removed from the area of risk, so far as is practicable. In a large development drive it may be practicable to scale and then support the exposed area remotely, using mechanised equipment, prior to personnel entering the area.

Hand scaling operations, while detecting loose material around the perimeter of the excavation, may not adequately identify large blocks which may be unstable.

A geotechnical assessment needs to be carried out regularly to confirm whether the ground conditions are unfavourable, and conducive to the formation and exposure of large unstable wedges in the workplace. This assessment will not only determine the appropriate rock reinforcement and surface rock support to be installed, but will also help to determine the risk of exposure to a potential rockfall hazard.

The Department recommends in the first paragraph of Section 5.4 (Progressive Scaling and Support) of the guideline entitled **Underground Barring and Scaling** that “large areas of backs should not be scaled before the installation of appropriate rock support and reinforcement commences”.

In light of this potentially serious incident it is important to remind operators that hand scaling operations should not be carried out beyond the last set of supports in locations where large unsupported areas become exposed, and there is a possibility of unstable wedges being formed. Support should be progressively installed with appropriate equipment.

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