

BLASTING TO INITIATE BLOCK-CAVING IN SERPENTINE

A case study at the McDame Project of Asiar Mining Corp., Canada

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ABSTRACT

Until 1990, a production of asbestos ore at Asiar was by open-pit methods. With the impending exhaustion of open-pit reserves, a decision was made in February 1988 to continue mining underground, using the block-caving technique.

In planning a blasting procedure, there were several constraints:

1. Contamination by pyritic or non-ferrous metals could not be tolerated. This eliminated the use of shock-tube detonators, pyritic film-wrapped cartridge explosives.
2. The explosive had to be capable of being pre-loaded and septined in the boreholes for several weeks.
3. The potential for cut-offs had to be minimized because of the naturally-caving ground conditions.
4. Vibrations had to be kept low to prevent damage to the ground support in neighboring areas.

In addition, a rather complex blasting technique was adopted:

1. Pneumatically loaded ANFO as the main explosive. (A pumpable emulsion was considered, though the cost would have been much greater due to the slow movements and remote location of the mine. Because of the dry conditions, it has proved possible to seep ANFO in boreholes for up to 3 months and still achieve good blasting results).
2. Toe-pitching with cast boosters initiated by iron wire, short-period electric detonators.
3. Use of a sequential blasting machine so that several drawpoints could be fired at a time at one hole per day.

4. Mucking below loaded holes which contained the detonators.

This paper will describe how this scheme has been simplified. Additionally, the following topics are included:

1. Allocation of firing burden to optimize blasting results.
2. Testing for ground faults and stray currents, made necessary by the practice of loading AM-24 II pneumatic over the wires of electric detonators.
3. Methods of secondary breakage, including the use of shaped-charges of emulsion explosive.