

THE DEVELOPMENT AND TESTING OF A NEW MECHANICAL STEMMING AID

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ABSTRACT

The development and testing of a simple mechanical stemming aid (Patents pending) resulting from a Joint venture by Incubator Technologies Inc. and the University of Missouri-Rolla and funded by the U.S. Department of Energy is described. The aid comprises a solid unit placed in the stemming above the explosive column and is designed to improve blasting efficiency and reduce drilling and blasting costs. It works with back filled drill cuttings or any other suitable stemming material.

The R & D program was initiated in October 1986. To date it has consisted of the testing of the aid in small diameter holes in competent rock, for both bench and crater blasting configurations. Full scale field trials are scheduled through 1988. Data acquisition equipment include both acoustic and seismic monitoring units and a Spin Physics SP2000 high speed video motion analysis system. Measurements for each test include peak air over pressure, ground surface ppv, stemming displacement and velocity and face movement and extent.

The results to date are extremely favorable. Substantial reductions in stemming ejection velocity or ejection elimination have been achieved, whilst reducing stemming by up to 35% over conventional practices. Peak air blast pressures have also been reduced by between 8 and 25 dB.

Examples of the potential economic benefits of the aid are given with cost/benefit analyses for a selection of different operational requirements in surface mining and civil construction.