

Third large open-pit mining conference held at Mackay, Queensland, Australia, 30 August to 4 September 1992

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The conference was divided into a total of 12 different sessions. Apart from the keynote addresses, the papers covered many aspects of open-pit mining, from mine design and blasting techniques to mining operations and equipment, as well as water management and rehabilitation. A number of case studies were also presented. Most of the 68 papers originated from Australia; however, presentations were also made by representatives from Chile, Indonesia, Papua New Guinea, and South Africa.

The keynote papers dealt with subjects such as the economics of open pits, project planning of a new large copper deposit, management principles, and rehabilitation strategies.

Maintaining and improving the economics of open-pit mining in future will require an understanding of those characteristics of open-pit mining that are different from other mining or business activities. Mines must be designed to be less susceptible to changes in these important characteristics, and strategies adopted that yield reliable returns despite unforeseen change. Planning and production personnel require guidelines and performance standards that are based on sound economics, not solely on production criteria. The guidelines adopted for long-term implementation must assume a declining price for mineral products along with declining real costs, with research efforts directed at the development of both evolutionary and revolutionary ideas and their implementation. Decision-making must focus on risk and probability criteria rather than just simple return-on-investment, and the approach to management of personnel must support the higher level of communication essential for fast decision-making in an environment of continual change.

The feasibility of using a 170 km pipeline for transporting ore concentrate was emphasized in one paper as an economical alternative. Most important keys to successful management achievement are, for example, the authority to 'hire and fire' as well as encouraging multi-skilling and labour involvement in the future of the company. Rehabilitation or environmental management is, of course, essential in today's situation and the trends show that these aspects will become increasingly critical in determining the viability of mining projects worldwide. One author described how an underground mine, which had been operated for very many years, had been developed into an opencast mine to improve productivity and competitiveness in the market. Usually, a mining project would start with the surface operation and eventually develop into an underground mine.

Papers dealing with mine design described the importance of optimizing the final pit slope. One example was given where a minor, computer-calculated change had

reduced the waste stripping by over 20 Mt. However, it was stressed that thorough investigations are essential to avoid slope failures, which may occur as a result of over-economizing. Grade-control principles need also to be examined in detail during the design phase to arrive at correct decisions and layouts. Scheduling methodology utilizing the latest computer developments is also of utmost importance in order to make the pit competitive in an ever more cost-conscious market. Waste-dump location, design, and planning are further aspects that must not be neglected when determining the viability of a new or extended open-pit project.

In the session on blasting, the topics covered computer spreadsheets for designing cost-effective blasts, damage to slopes as a result of using incorrect explosives, methods of determining detonation velocities and fragmentation, as well as new developments for optimized drilling and charging procedures. Cast blasting, if correctly applied, could be a major cost-saver in dragline operations, and the profile of the broken rock or muck pile is of great importance when a cost-effective loading cycle is to be maintained. Pre-splitting and buffer blasting are two important techniques that can contribute to the overall profitability of open-pit activities.

The role of contractors in open-pit mining operations is addressed in some of the papers. This trend to employ specialist crews in a short- to medium-term basis seems to be becoming more and more popular and is proving to be an economical alternative to large capital investments. Comparisons between bucket-wheel excavators and normal shovel-truck operations indicated that in some cases the one is to be preferred, while in others the alternative is more advantageous. This again shows that there are hardly any identical mining ventures, and each project has to be evaluated on its own merits. New developments and techniques in drilling and loading equipment are amply described by various authors, and it is stressed time and again that, in order to optimize the economics of an open pit, the latest technological advances must always be considered. The importance of benchmarks and physical performance standards is also emphasized, and in order to stay competitive mine managements must continuously attempt to compare their mine with similar operations worldwide.

Water conservation and rehabilitation/environmental management are very topical issues in today's mining world. These subjects were given adequate attention in two separate sessions and a total of nine presentations. Although all the authors were Australian, much of what was discussed in the papers is equally applicable to South Africa.

In conclusion, a large proportion of the papers presented make worthwhile reading, and copies of the proceedings should be obtained, particularly by operators of big open-pit mines.

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