A NEW PUSH BACK DESIGN ALGORITHM IN OPEN PIT MINING

BY

SALIH RAMAZAN

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Signed _____
Salih Ramazan

Approved _____
Dr. Kadri Dagdelen
Thesis Advisor

Golden, Colorado
Date 12/7/96

_____
Dr. Tibor Rozgonyi
Professor and Head,
Mining Engineering Department

ABSTRACT

In a long range mine planning, after generating the ultimate final pit limit, push backs are to be obtained to have a yearly production plan in a way that the net present value of the money gained from the mining operation will be maximized. However, when the grade distribution in a deposit is not uniform, there may be very big size difference between push backs created by conventional methods. This size difference causes serious difficulties in production scheduling process. The algorithms may fail when the planned production per scheduling period can not be matched because of the large increments between adjacent pits. The optimality of conventional methods is also controversial when the stripping is considered in production scheduling. Conventional methods aim to maximize undiscounted cash flow or amount of metal for each mine period.

In this thesis research, two new alternative solutions are developed to handle the gap problem. In the first alternative solution, A new algorithm is developed and implemented to design push backs that minimize stripping ratio in a given incremental pit. Push backs obtained by using a conventional method which maximizes undiscounted dollar value for a certain volume and those generated by using minimum stripping ratio method are overlapped. By doing this, push backs that contain a certain number of ore blocks with maximum undiscounted value and minimum stripping ratio are obtained.

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