



Technical Article

A Computer Simulation Model for a Surface Coal Mine

Edited by on 21. Jan. 1981

[Published in bulk solids handling, Vol. 1 \(1981\) No. 1](#)

This paper describes the application of the open pit materials handling simulator (OPMHS) to a surface coal mine in Illinois. The mining method practiced is classified under the general heading Area Mining. The overburden is removed by a bucket wheel excavator (BWE) and a stripping shovel operating in tandem. The specific objective of the study was to demonstrate the application of the simulator to analyze mine planning and scheduling problems through the generation and evaluation of alternatives on the basis of simulated results. On the basis of the simulation of the existing system, it is concluded that on the average the system can perform to within 85% of the designed capacity. The performance of the stripping shovel was identified as the bottleneck in the system. However the production can be increased to over 95% of the designed capacity by increasing the availability of the stripping shovel from 71% to 80%. Also a number of plans to increase the production capacity of the mine by the introduction of new equipment was analyzed.

Introduction

Coal production from surface mining has been on the increase ever since 1960, during the last 10 years coal production [1] from surface mining has grown enormously (Table 1). In fact, since 1974 the production from surface mining has

exceeded that from underground mines. The US Federal Energy Administration [2] has predicted that surface mined coal would play an even more important role in meeting the projected production increase for the coal segment of the energy market (Table 2). Large production requirements from surface mines necessitate deployment of many large pieces of equipment. This equipment must be utilized efficiently by maintaining production at or near designed capacities. Basically, the problem is to select, size and schedule equipment to maximize production and minimize adverse environmental impacts [3]...