OPTIMIZATION OF DRILL AND BLAST PARAMETERS IN KIBINI QUARRY MINE, KAJIADO COUNTY

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ABSTRACT

In both Surface and Underground mining, drilling and blasting plays a vital role in extraction operations. They are the major units of operation and currently takes about 25% of all the operation cost of a given mine. The cost of production can be reduced significantly through properly designed blasting pattern and good choice of explosive which ensures optimal fragmentation of the blasted rocks. Rock fragmentation obtained from blasting is said to be optimum when it contains maximum percentage of fragments within the desired range of size. Proper adoption of drilling and blasting can contribute significantly towards profitability and therefore optimization of these parameters is essential. In this project, a practical case for optimizing blasting operations at Kibini quarry, Kajiado County, Kenya was done to describe all the technical practices performed in mine-to-mill optimization at a limestone operation. Controllable parameters such as burden and spacing, inclination of the holes, explosive consumption were considered in this project. Data was collected through direct observation in the field, monitoring values in the field (burden& spacing and explosives used) and also getting secondary data from the company to beef-up the project. Rocks in the region are generally of medium hardness hence ANFO is the most suitable explosive to use. Rotary-percussive drilling rig is used to bore holes for placement of explosives. Various techniques of fragment analysis were used to quantify the fragments in relation to the loading capabilities and gape size of the crusher at Kibini. The results showed significant improvement using the monitored values in the field compared to company values hence if implemented together with few improvements will lead to optimization of the operating cost hence profit to the company.