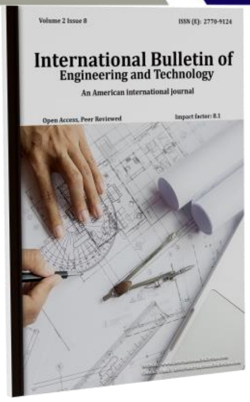

CALCULATION AND DEVELOPMENT OF A MODEL OF THE BLASTING AREA IN MINING ENTERPRISES

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Abstract: This paper presents a review of existing models for blasting impact assessment in mining operations and after rock blasting. models for calculating crushed and cracked zones were developed. Control of these zones is of great importance in rock blasting design, as it has been researched to optimize fragmentation and consequently minimize the area limit of the mine. In mining enterprises several examples are presented based on the theory of processes and research during the period of production and restoration. In addition, this optimization can reduce damage methods of boundary setting and excavation plan are explained through drawings with geometrical design. Models are divided into categories and studies divided into three groups based on the approach, i.e. analytical, numerical and experimental approaches and relevant studies for each group are classified and data are presented in a comprehensive manner. More specifically, in analytical methods, assumptions and results are described and discussed. Considering the research findings to provide useful information for evaluating the applicability of each model numerical models, all commonly used algorithms, simulation details and impressive parameters are reported and discussed. Finally, given the experimental models, the data are given. Here is a presentation of commonly used laboratory models. Empirical the equations derived from the models and their applications are discussed in detail. In the discussion in the section, the most common methods are selected and used to estimate the amount of damage in 12 cases and several processes underlying learning problems have been cited. The results are then used to compare the accuracy and applicability of each and the results of the selected method are taken into account. In addition, a probabilistic analysis of explosion-induced failure is considered and it will be necessary to use multiple structural reliability models. Selection, classification and discussion of models the information presented in this paper can be used as a reference in actual engineering projects and mine blasting processes. The development and use of smart drilling rigs in mining enterprises allows obtaining accurate lithology data and blast drilling requires several computational steps. To make full use of drilling data to improve blasting efficiency, the following research work was carried out. First, a database is created to manage and store blast hole data and recognized by the smart drill. Second, blast hole lithology data is sampled and the inverse distance is used to interpolate the solid elements of the blast range to create a

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square method and a three-dimensional solid model of the blasting rock mass is developed. Next, the blast range is polygonal to obtain a truncated 3D solid model of C++ programming language is used to implement all blast hole charge quantity and blasting creates opportunities for calculating processes based on a three-dimensional solid model of the rock mass.

Keywords: Rock blast, damage caused by explosion, calculation of crushed and cracked zones, blasting range, blasted area boundary, blasting applications in mining enterprises.

Introduction

To extract rock mass in mining enterprises and prepare it for further drilling and transportation, blasting processes are widely used in the mining industry. In such conditions, mining is good if it is good and provides efficient operation, facilitates excavation and loading processes. Thus, much emphasis is placed on evaluation, in mining enterprises, the size of the damage caused by the explosion in the rock mass is calculated. This is the main purpose of this research site blasting optimization as well as mineral extraction optimization and calculations are carried out based on the processes during the recovery period. It should be noted that a large amount of fine material is also produced and in the induced crush zone around the blast hole, the position changes relative to the boundary area of the deposit. Thus, increasing the amount of fines increases handling and processing costs and in many cases reduces the value of the product. In addition, in some cases, for example, quarry production, are recognized as manufactured fines. Minimization of damage caused by explosion is the main goal in mining enterprises. This is the principle should also be taken into account, for example, in the walls of drifts and other underground openings also, calculation steps are carried out from the side border area of surface mines. The damage penetrated through the walls and part of the side border area considered as unwanted damage or excessive damage. This type of damage has been done by bursting, thus directly affecting the core stability and performance. Accordingly, several measures have been taken to reduce such damages.

* In mining enterprises, the length of the blast boundary area is calculated as the distance to prevent possible damage to structures.
* It is necessary to increase the strength of the walls of the border and side border area of the mine.
* Increasing the rate of extraction in mines.
* Reduce production costs and prevent problems.
* Reduction of operating costs in mining enterprises.

In summary, blast can be optimized by controlling the size of the crushed zone, we have opportunities to minimize the degradation and production of materials and the recycling cycle. At the same time time, crack zone optimization may result in more than expected damage reduction and excavation limit, control of incoming damage and adjustment of blasting pattern it is necessary to consider the state of geometric design. Therefore, rock blasting operations have one main objective was to keep unwanted damage under control. It is necessary to achieve this goal the devastation caused by the explosion will need to be understood and anticipated. The degree of damage to the rock as a result of blasting is important parameter to understand the development of mines, civil infrastructure and development projects. There are a number of theories is presented to estimate the range of damage for typical explosions scenarios. These theories have historically been overblown the degree of damage to the stone material and not so great effective in assessing damage to larger rock masses structural and regional concepts are limited complex geology. During the blasting process, there are several stages of loading which can damage the rock mass occurs. Most practitioners Agree that the initial impact and pressure will serve to prolong the loading pre-existing micro-cracks in the rock material surrounding the borehole. These cracks are further widened by gas pressure from the completed explosive process inside the hole. In the array rock, the extent of these cracks is the sum of rock damage observed. Geological cracking, discontinuities and there are joint / bed planes, the gas pressure is often directed it penetrates into natural cracks and tends to expand and/ or widen pre-existing cracks to damage remotely intact rock material. Therefore, the assessment and prediction of rock mass damage is more relevant than the strength of the existing geological conditions intact stone material. On the contrary, in solid stone material, it is predictable models are used more judiciously considering the rock strength to estimate the level of damage. Therefore, the comparison data used for the presented damage prediction methodology in this article is taken from a rock deposit that is more massive in nature. For an exact model that takes both damages into account intact rock and rock mass damage, other parameters will be should be taken into account. The methodology in this article is to understand and provides a tool for assessing damage to intact rock well in typical blowout scenarios.

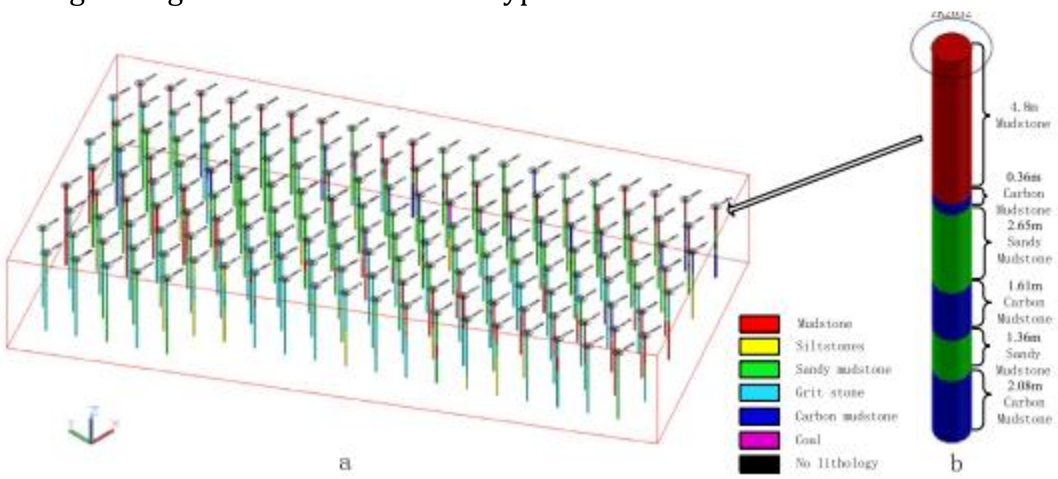

Figure 1. 3D histogram of blast holes: (a) 3D histogram of all blast holes; (b) ZK2032 well histogram.

Let's plot the burst hole histogram. A three-dimensional histogram is displayed in three dimensions, and may be the structural distribution and specific thickness of the ore and rock layers within the blast hole. As shown in Figure 1, it is clearly visible. The Tebin Bulak open pit iron mine in the Republic of Uzbekistan is shown in Figure 1a; three-dimensional histogram of a single blast hole shown in Fig. 1b. Rocks with different lithologies are filled with three-dimensional solids of different colors. The name of the rock thickness and lithology is marked next to the three-dimensional rock column. The picture is this Three-dimensional histogram of blast hole ZK2032, with a total of six layers of rock. From hole to hole hole bottom, rock name and thickness mudstone 4.8 m, carbonaceous mudstone 0.36 m, sandy mudstone. 2.65 m, carbonaceous mudstone 1.61 m, sandy mudstone 1.36 m, carbonaceous mudstone 2.08 m.

Conclusion

This paper examines the most important available models for the evaluation of crushed and fractured zones caused by explosions in mining enterprises. Models are divided into categories three groups, namely analytical, numerical and experimental approaches. First, the mechanism of rock explosion is described from the initiation of the explosion and the propagation of the stress wave to stone failure. Next, the damage is grouped into two forms crushed and fractured zones and were the most important parameters affecting these zones reported. Then, the most important ways to estimate the dimensions of each damage zone checked. More specifically, analytical models are presented based on the two main parameters of PPV and blast hole pressure. Reviewed by numerical methods commonly used numerical codes including FEM, DEM and FDM methods. Due to experimental models, primary cracks are divided into two general categories deep cracks caused by high stress waves and gas intrusion and are discussed in detail. Finally, a series of empirical models derived from laboratory results a a step-by-step approach. The most commonly used models described in this review were selected to separately calculate damage sizes in 12 case studies. relevant literature and presented in a consolidated form. All results were compared, and their differences or similarities were discussed. Next, there are probabilistic models to analyze the probability of failure Factors resulting from rock blasting are reviewed and their advantages over deterministic models are described. Comparisons were made between different models, and the relative importance of the parameters involved was examined through reliability sensitivity analysis. This review has categorized and reported the most important assumptions and key points along with the relevant literature, their prominent results allow for more consistency and consistency. proper use of their content. Thus, the results of this study can be used a comprehensive and classified resource for rock blast damage assessment. However, in order to make practical use of the methods presented here, one must have their primary sources is used for detailed information. Finally, this paper only covered single-hole explosion. Cases with multiple explosions due to the interaction between the blast waves emitted from each blast hole, a system of damage zones is formed, which can potentially overlap and causes more complex failures in the environment. This topic remains a concern of the authors for future research work. Otelbayev Azizbek a student of the Nukus Mining Institute of the Navoi State University of Mining and Technology, took part in the first blasting processes at the Tebin Bulak iron mine. 521 detonators were detonated in Tebin Bulak iron mine. Azizbek is very interested in the activities of mining enterprises.

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