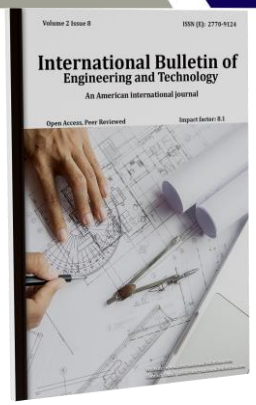

IN MINING ENTERPRISES RESEARCH ON THE STUDY OF GEOTECHNOLOGICAL PROCESSES

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Abstract: The activity of mining enterprises in the Republic of Uzbekistan is clear understanding of the influence of geotechnical conditions on seismic hazard still remains. Some reef types are at risk of rock explosions. Stability and deformation behavior of excavations in different reef horizons under the influence of rock types and effects different power characteristics. Therefore, the seismic response to mining operations is also expected to be different and is being implemented in accordance with geotechnical conditions. As an example of these actions, the blasting processes of Triangul Metals TebinBulak in the Republic of Karakalpakstan were observed, and research was conducted to study geotechnological conditions. Analyzes of moment tensors showed that most of the phenomena of large magnitude not associated with geologic structures, but facies, representing shear failure of intact rock. occurring before the mining front. Preliminary modeling showed that the closure volume the shale footwall may be higher than the quartzite footwall, providing a possible explanation. differences in seismic response were observed.

Keywords: Triangul Metals TebinBulak iron mine, seismic hazard, deep mining, geotechnological conditions, shear failure, rock type.

Introduction

Directive documents in the field of geology of the Republic of Uzbekistan specify one of the following the main priorities of the reform of the field of geology are to increase the objectivity and reliability of geology extensive use of modern technologies and advanced methods based on data, their in-depth analysis forecasting of geological mineral reserves taking into account the requirements for efficient use of the subsoil and production of mineral raw materials. After our republic gained independence, independent development became an important economic factor development - providing the republic's metallurgical plants with their own mineral raw materials and especially an important product such as iron ore - the basis of any developed and metallurgical industry developing countries. Until now, the Uzbek industry has focused on imported raw materials and semi-finished products From other regions of the Commonwealth. Currently, this approach is ineffective and very expensive. Therefore, the task of searching and finding local raw materials was set. In this regard, the Geological Survey He faced an acute problem - the identification and evaluation of local iron ore reserves opportunities for metallurgical production of the republic and their wide application in industry were created. Employees of the Nukus Mining Institute at the Navoi State University of Mining and Technology Dzhaksimuratov. K, Karamov.A, Jumabayeva.G, Bekmuratov.A and Allanazarov.B, O'telbayev.A observed blasting processes in Triangul Metals

TebinBulak iron mine, Republic of Karakalpakstan. 521 detonators were detonated in the first blasting operation in the iron mine. I watched the blasting process from a distance of 1 km. The speed of sound and the rise and spread of dust continue over a long distance. Geotechnological analyzes are carried out during blasting.

Picture 1. Employees of the Nukus Mining Institute at the Navoi State University of Mining and Technologies at the Tebin bulak iron mine (December 2022).

Geotechnical conditions in Tebin Bulak mine

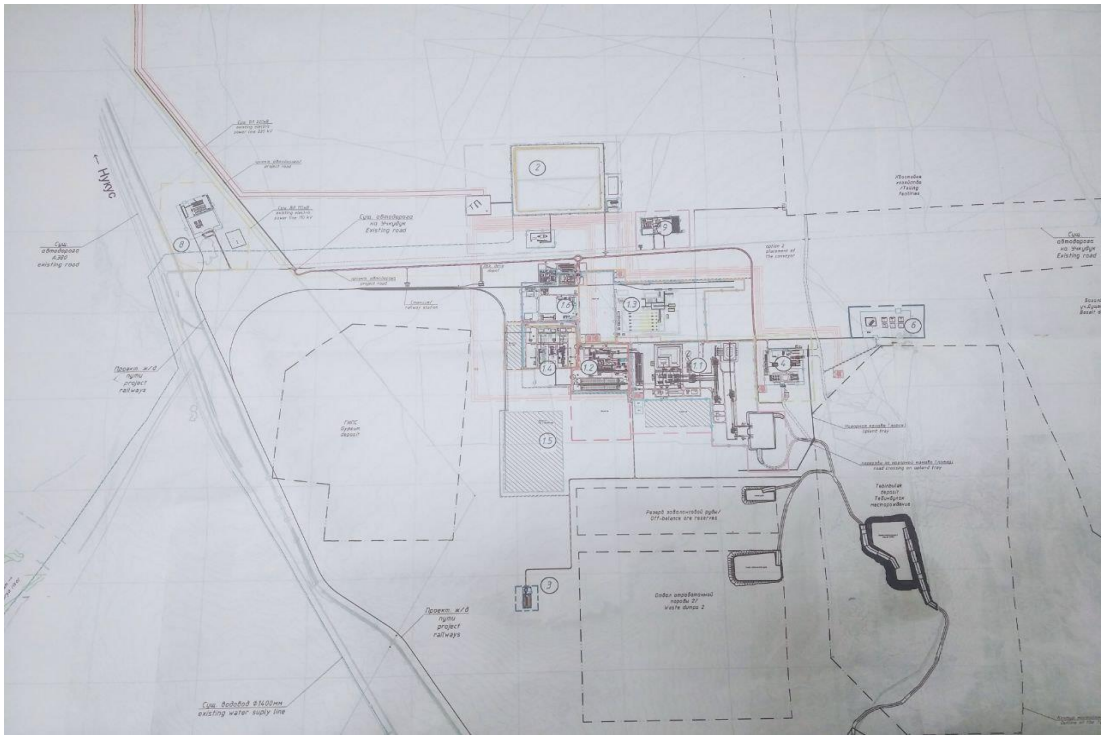
At the Tebin Bulak mine, the mining method was changed to "sequential network "extraction". Consists of mining A development network accessible to the reef (Picture 2). The raised lines are 220 m apart. This allows to do partially mining, leaving 30 m wide regional dip stability pillars in the middle mining blocks are formed. The stopping distance is 180 m on the shot and several hundred meters deep. A recent 30m wide strike columns are left in addition to the sinking columns. In the mine further reducing the extraction ratio and reducing closure size and corresponding seismic response. Due to the depth of the mine, the activity in the mine has recently started stress levels are high and mine-related seismicity and possible rock blast injury is the biggest risk in the mine. Exactly mine design is required to manage seismic risk and ensure safety. Managing a range of seismic hazards over the years strategies are included in the mine design strategy. The majority the goal of these strategies is to reduce excess shear stress and seismically active geological formations and minimal volume closing in parking lots. Current Seismic Hazard Management strategies are as follows: Another such field of application is geotechnics. Surface mining involves planning and design processes. Although this has been proven a lot times to be of great importance, yet it is often neglected, especially early mine inspection and planning stages. This article discusses some important aspects of geotechnical planning and how they are related stability of the mine is presented. Like this as the paper shows, appropriate geotechnical planning and design can be important it is necessary to ensure the stable operation of the surface mine. Below are some of the key points that support this statement:

- An important part of the economical surface extraction is related to the stripping ratio. The the lower the ratio, the more profitable the mining operations. Withdrawal ratio determined based on the maximum angle of stable slopes that can be excavated place However, if slope

failures occur between ramps, this can have a significant impact on mining operations, especially if haulage routes are affected or equipment is damaged.

- Improper slope designs lead to failure can result in casualties or injuries that affect employee confidence, undermine the company's credibility, and have a negative impact. social license to operate.

- Large slope failures, esp mine tailings can be significant and negative impact on the environment and even force the closure of the mining operation.



Picture 2. Plan view of west side of Tebin Bulak mine, open pit location coordinate plan drawing showing boundaries of partial mining and blasting area.

Conclusions

Behavior of mining stopes in deep iron mines different rock types and different rock mass are affected and rock strength properties are determined. Role of geotechnological condition however, the seismic hazard in deep-level iron deposits is not clearly understood and has never been properly calculated. This is expected to vary depending on the seismic response of the mine different rock types may be present. Seismicity to verify this behavior Studied at Tebin Bulak iron mine. Two different geotechnical zones depending on the difference can be determined for the VCR horizon footwall lithology. On the eastern side of the open pit is the mine boundary wall bernuclite mineral and on the west side there is a border layer of stratified quartzite wall gradual transition from thin quartzite footwall to thick quartzite in the center of the mine, the border is separated from the field border. Careful selection of seismic data for east and west sides mined to allow comparison with seismic responds to mining operations between two geotechnical areas. Everything mining areas or time periods with significant difference mining depth, mining geometry and geological frequency structures were excluded. Based on selection criteria, only data for the period 2022 to 2023 were used. During this period, mining was carried out in the shale wall and the quartzite wall and were comparable at the same levels and depths. Mining intervals and mine geometries were also assumed to be similar. The study showed that the mined layer is for the mine wall

area in the geotechnological analyses there is a tendency for more large-scale events to occur similar mining volume and range compared to quartzite footwall area. β-values of frequency-magnitude The distribution of events also confirmed that it is seismically dangerous mining appears to be higher under shale as larger events can be expected in this area. By thinking moment tensor solutions for seismic events of magnitude most of these phenomena are seen when the range is ML ≥ 1.4 not related to face direction and stress direction based on geological and geotechnological structures..

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