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CASE STUDY OF CONTINUOUS MINER ALONG WITH ROOF BOLTER

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Abstract - *This method is introduced to overcome the problems occurred due to the geological disturbances and introduce the latest technology. This process eliminates the drilling and blasting operations and implementation of latest and technology. This helps in use of latest method of roof bolting in place of manual roof bolting. The roof bolting and continuous mining operation helps in great increase in the development of output and avoid of dangers due to roof fall, side fall and any other kind of dangers. The continuous miner loads the coal into the shuttle car and car transports the coal to desired spots. The whole machinery is powered with load canter. Continuous miner technology helps in achieving high production and faster rate of extraction with safety. Continuous miners and shuttle cars combination are used to transport the coal from face to a transfer point (feeder breaker).The present study has been aimed for optimum utilization of continuous miner by examines the performance analysis of continuous miner and also designing of support system under various roof conditions such as: At roadways and junctions, The area intersected with slips and faults, During depillaring. From the collection of borehole data at various locations of continuous miner panel different rock properties are drawn and for designing of support system CIMFR – RMR classification was used. From the performance analysis of continuous miner the reliability of continuous miner is 89.87 per cent and failure probability is 10.13 per cent was achieved and also different conclusions are drawn which shortly explains an overview of all work.*

***Key Words*: Quad bolter, continuous miner, shuttle car, load center, depillaring support system**

1. INTRODUCTION

In this mechanization continuous mining method is one. This method utilizes the continuous miner with a large rotating steel drum equipped with tungsten carbide teeth that scraps coal from seam. Continuous miner not only cuts the coal but also fed the coal onto conveyor. It is generally used in room and pillar mining. Now a day's remote-controlled continuous miner is also being used in difficult conditions and robotic versions are controlled by computers.

1.1 STUDY OF CONTINUOUS MINER

Some continuous miners can bolt and dust the face while cutting. These mostly used in foreign countries such as Australia and America. Now Indian coal mines are also introducing the continuous miners for high production and safety. To accomplish higher production and safe mining condition, require high automation in underground coal mines. The utilization of continuous miner in underground mines is increasing periodically, resulting in higher productivity and safe mining conditions. To meet the ongoing demand of coal in the country, immediate attention is required for improvement in the production from underground mines. India's coal ministry wants to better utilize land to meet a growing energy demand.

2. METHODOLOGY

A continuous miner is a mining machine that produce a constant flow of ore from working face of mine. The machine continuously extracts as it is loading coal with continuous steel drum and conveyor system. Continuous miners can typically use in room and pillar mining operations. The continuous miner is different from conventional and cyclical mining methods, which hault the extraction process in order for ore loading to proceed. Continuous miners, which began to take off in Sminning industry in 1940's makeup of 45% of underground coal mine production. Today continuous miners are being developed as driver less machines controlled with remotes

Generally, board & pillar section use one continuous miner and two electric/diesel/battery shuttle cars travelling between the miner and the feeder breaker. One quadra boom roof bolter equipped with temporary roof support system and able to drill on wet.one feeder breaker, which receives coal from shuttle cars and crushes the coal to –200 mm size before it is fed to the main conveyor from electrical equipment which is load canter , centrally located at one place from which power from which power supply will be given to different equipment CM , SC , FB, QB, LHD , lighting etc., one electrically operated LHD/utility vehicle for multipurpose jobs like sweep the tramming route and maintaining gradient, to sweep the heading face, to sweep after each advance of the conveyor, to transport material and consumable goods, feeder cables during advance. Coal pillars of large dimensions are left out in underground coal mines to support the huge burden of the overlying strata for safe mining conditions. More than 3000 million tons of coal reserves are locked up in the form of coal pillars in India

2.1: DEPILLARING USING CONTINUOUS MINER:

After the formation of board, pillar pillar extraction or depillaring of coal can be carried out by continuous miner. Continuous miners typically have cutting head i.e. 3.3m wide. The machine is usually "spumed in" between o.5m and

0.75m at roof level, with a rear stab jack on the machine lowered if required, and then the head is shared down to the floor level. His cycle is up to permitted cut-off distance and the roof and floor are trimmed level during the cycles. The continuous miner can sump and shear down whilst waiting for return of shuttle car. The boom enters the pile of coal on the gathering apron, loading rates into the shuttle car very high. The cutter head usually loads around 8t per 500mm sump in a 3.5m seam

SPLIT AND FENDER METHOD:

In this method, the extraction of coal is carried out in a sequence of cuts through the pillar parallel to dip to form two fenders (Wings) of coal. The roof with in the split shall be supported with roof bolts. Fenders are extracted from the split and original gallery with additional supports as shown in the figure.

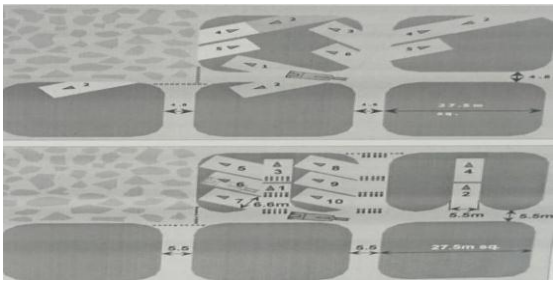

Fig-1: split and fender method

3. CONCLUSION

The proposed panels CMP – 7A and CMP – 7B were the original roadways developed with 4.2-4.5M wide and 2.8-3.0M height galleries along the roof with pillar size 45Mx45M (centre to centre). To extract these pillars with splits and slices method of mining using CM technology, first of all panel has to be prepared with proper size of roadways so that the CM and shuttle car etc…. can move smoothly. For this purpose, all road ways can be winded to 6.5M from either side with 3M height along roof. The district has one continuous miner and three shuttle cars of 10T capacity with 200M electric cable. Shuttle car receive coal from Continuous miner and dump it into the district belt conveyor through feeder breaker. The feeder breaker limits the size of lump sand regulates the feed to the belt conveyor

MERITS OF THIS METHOD:

- High production is achieved.
- The entire thickness can be extracted by ranging the cutter boom height.
- Safety is possible by remote control operation
- The machine is crawler mounted because it can be negotiate higher gradient

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