

CONTENTS:

This programme will cover:

- Operational and rock mechanics aspects of CM based mechanised depillaring with respect to the conventional depillaring.
- Understanding of different technical elements and manner of extractions in MD.
- Basic rock-mechanics implications of straight line of extraction and impact of faster rate of depillaring.
- Design of irregular shaped rib/snook and their possible dilution during the retreat of the MD operation.
- Role of high capacity, pre-tensioned, stiff and resin grouted bolts as roof support; especially at the goaf edge.
- Strata/Ground control issues during the MD under difficult roof strata.
- Case studies of CM burial during caving of strong and weak roof strata.
- Rock mechanics challenges for mechanised extraction of existing developed coal seams from Indian coalfields.
- Instrumentation and monitoring of strata movement for safe and efficient MD.

LEVEL OF PARTICIPATION

Practicing Underground Coal Mining Professionals along with Rock/Mining/Civil Engineers, Geo-Technical Researchers, Mine Managers, Geologists, Safety Officers and other Responsible Executives for Strata Control and Support Design in CM panels. The programme would also be useful to Mine Planners, Consultants and Academicians.

Duration: Five days

Date: 4-8 December, 2017

Registration Fee (includes boarding, lodging and the course kit): Online payment of the fee, which is ₹40000/person (Rs. Forty Thousand), may be done to A/c. No. - 30256736794, Name and address of Bank - SBI Bank, Hirapur Branch, Dhanbad, Jharkhand, India, MICR No.- 826002007, IFSC/RTGS code - SBIN0001670 (same code for both)

or

through a DD in favour of: **Director, CIMFR,** payable at **Dhanbad.**

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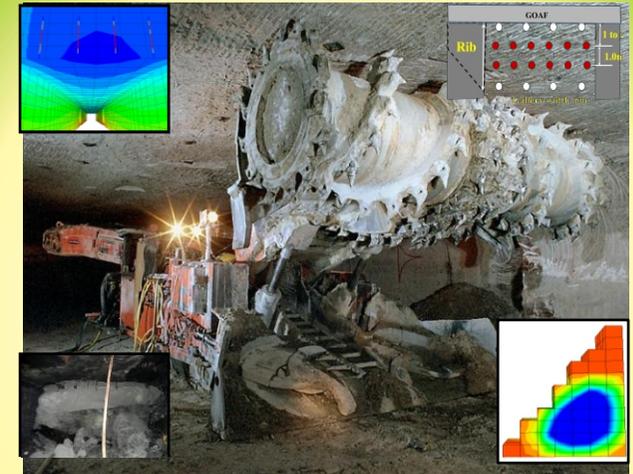
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An executive development programme on ROCK MECHANICS CONSIDERATIONS FOR DESIGNING GEO-TECHNICAL ELEMENTS OF A MECHANISED BORD & PILLAR MINING

Date: 4-8 December, 2017



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BACKDROP

Different techno-economical factors have favoured development of a number of coal seams by Bord and Pillar (B&P) method. However, the inherent geo-technical challenges of a depillaring operation have locked a large amount of coal in pillars. Extraction of these pillars (depillaring) is a priority for coal production as they are also blocking mining activity in underlying coal seams. Existing facts and figures about different developed coal seams find depillaring as one of the most important issues for the Indian coal mining industry. Most of the depillaring practices in the country have adopted semi-mechanisation, where drilling and blasting is used for winning of coal and machines like SDL/LHD for coal haulage. Efficiency of these conventional semi-mechanised depillaring is limited due to broken nature of the operation and slower rate of extraction. These two parameters are directly connected with overlying strata behaviour and therefore, the conventional depillaring often encounters strata control problems.

To ease the involved efficiency and safety problems of the conventional depillaring, Indian coal mining industry has introduced mechanised depillaring (MD) operations in some of its mines. These MD operations in different coalfields of the country experienced mixed outputs. Issues like-collapse at working face, overhang inside the goaf, dynamic loading of natural supports and design of effective goaf edge support are observed to be important for

the success of a MD operation. Although considerable amount of work is done to design different elements of the MD, there is an apprehension about success of these design norms in Indian coalfields. In absence of an indigenous norm for rib/snook, different field applications of MD in India have adopted trial and error method of the design. Field performance monitoring of these MD operations generated valuable data for the rock-machine interaction. Uniqueness of rock mass and existing complexities of geo-mining conditions of Indian coalfields restrict direct adoption of any foreign design. Frequent attempt to encroach working areas by competent roof strata during caving is a typical problem of Indian coalfields.

Underground extraction of developed pillars by a continuous miner (CM) created different design issues, mainly, due to the following reasons: irregular shape of rib/snook, straight line of extraction, high goaf edge velocity and application of high capacity, pre-tensioned, stiff and resin grouted roof bolts as support system even at the goaf edge. Different inherent geo-technical elements of a MD approach need to be tuned as per the existing geo-mining conditions of the given site. Comprehensive interactions of these geo-technical elements of the MD with the rock mass and existing mining conditions need to be understood to achieve desired results of the MD technology.

There are different case studies, where the MD performed extremely well, mainly, due to the valuable indigenous R&D inputs about the rock mass behaviour. A detailed rock mechanics consideration of the site conditions provided workable design norms for different geo-technical elements of MD. Experiences of successes and failures provided a firm basis to arrive at an optimal design, which need to be disseminated. Strata Mechanics Section of CSIR-CIMFR is closely associated with most of the MD operations in the country since the first trial in 2003 at Anjan Hill Mine. In fact, the growing number of MD operations for pillar extraction in Indian coalfields make it vital to smarten up the design strategy of different geo-technical elements of this method.

Attempted successful adoption of the MD in different mines of Indian coalfields involved good understanding of the rock mass behaviour through laboratory testing, field investigations and study on simulated models. These attempts have resulted in derivations of important design norms/relationships to improve practical mining conditions of the MD. On the basis of these lab/field investigations, conducted for different site conditions to match the geo-technical elements of MD with the existing rock mass and stress conditions, this programme aims to provide information about rock mechanics approaches to optimise the design of underground structures and meet the challenges of MD in Indian geo-mining conditions.