CMRI is not only engaged in development of mining technologies/methodologies for exploitation of complex coal deposits in different geo-mining conditions to have better ground control, better safety and higher recovery but has put commendable research including Numerical modelling exercises. CMRI has also initiated and already taken-up many multi-disciplinary research-works to suit the requirements of mining industry and conducted many seminars/workshops/ HRD courses to disseminate the knowledge to the people from industries.

**EXPERTISE**

- Subsidence prediction and control.
- Three-dimensional subsidence prediction.
- Depillaring under hard incavable rocks or poor rocks using the yield pillar technique.
- Pillar design for long-term and short-term stability.
- Two and three-dimensional numerical computer modelling for underground excavations.
- Extraction below built-up areas, water-bodies, etc.
- Pillar and excavation stabilisation measures.
- Problems associated with conventional and special depillaring methods like the blasting gallery method.
- Design of yielding chain pillars in longwall extraction.
- Problems on rock burst/coal bump
- Support performance evaluation and monitoring.
- Geomechanical rock characterisation, support design during development and depillaring.
- Mine Design by progressive instrumentation and strata management
Achievement

• Design of safe and eco-friendly mineral extraction-patterns, stability evaluation by numerical modeling techniques, design of support system and related strata-management strategies
• Design of guidelines for support in semi-mechanised bord and pillar depillaring working areas: on-going grant-in-aid project, near-to-completion
• Subsidence prediction approach for single seam workings in SECL Areas: Successfully completed grant-in-aid project
• Parting stability and Support requirements in coal pillar workings in level contiguous seams during depillaring and validation at Bord & Pillar mines: on-going grant-in-aid project
• Delineation of workings in 3 locations of ECL and stability analysis and validation by strata management with an aim to protect important surface and sub-surface properties: sponsored multi-disciplinary projects
• Geo-environmental assessment of subsidence hazard due to coal mining around Dhanbad and Jharia areas using Geo-informatics techniques: multi-institutional grant-in-aid project
• Problem-solving and suggesting solution of related geotechnical issues on the above mentioned activities and the subjects of on-going projects
SOME TANGIBLE BENEFITS

• to plan extraction safely and efficiently to make underground mines viable

• roof bolting is increasingly receiving attention not only because of paucity of timbers but also because of better efficiency and confidence getting developed because of technical back-ups provided by CMRI.

• Definite results: the roof bolting with the use of resins is not only a safer but also an economical option compared to cement grout bolting, prevalent use now-a-days.

• Economics are worked to find out a better option of safe coal-pillar extraction