CURRICULUM VITAE

DR PRABHAT KUMAR MANDAL

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BRIEF DESCRIPTION

Dr. Prabhat Kumar Mandal is presently working as a Chief Scientist and Head of Underground Mining Methods Division, CSIR-Central Institute of Mining and Fuel Research (CSIR-CIMFR), Dhanbad (cimfr.nic.in), a constituent laboratory under Council of Scientific & Industrial Research (CSIR), Ministry of Science & Technology, Govt. of India (csir.res.in). He is also Professor of Academy of Scientific and Innovative Research (AcSIR), India (acsir.res.in). He graduated in Mining Engineering in 1993 from Bengal Engineering College [presently, Indian Institute of Engineering Science and Technology (IIEST)], Shibpur, India. He did his M. Tech. from Indian Institute of Technology (IIT), Kharagpur and Ph.D. from IIEST, Shibpur, India. He has joined CSIR-CIMFR (then, Central Mining Research Institute) as a Scientist in the year 1994. He has 26 years of research experience in the field of underground mining.

His research interest is in the field of rock mechanics, ground control, computational geomechanics, underground mining methods, numerical modelling, strata control and management, stability analysis, instrumentation and monitoring of underground structures for safe and efficient extraction of coal and non-coal/metal from underground mines. His research outcomes are based on extensive mathematical and computational modelling as well as laboratory and field experiments. He is associated with the design of several advanced mechanised mining methods including continuous miner based method of mining, assessing suitability and modification of several existing mining methods to suite Indian geomining conditions. Under his leadership, several mining methods have been developed and practised successfully in underground coal mines like the underpinning-based method of mining for the extraction of contiguous and thick contiguous coal seams/sections, method of mining for the extraction of critically thick coal seams, method of mining for inclined coal seams, etc.

He has more than 150 papers to my credit published in various national and international journals, seminars, symposia and conferences volumes including 55 papers in journals. He has successfully completed more than 160 research, collaborative, sponsored and consultancy projects. He has four patents, co-authored one book and edited a few conference and workshop volumes. He has visited several countries like USA, Brazil and The Czech Republic for research/presenting his work. He is Fellow/life member of several professional societies and recipient of several awards. He is Academic Editor/Editorial Board Member/Reviewer of several SCI/SCIE/SCOPUS indexed international reputed journals.

EMPLOYMENT DETAILS

Post	Organisation	Duration From	Duration To	Job Responsibility
Chief Scientist	CSIR-Central Institute of Mining and Fuel Research, Dhanbad	10-05-2017	Till date	R&D, Collaborative, Industry sponsored/ consultancy work
Senior Principal Scientist	CSIR-Central Institute of Mining and Fuel Research, Dhanbad	10-05-2011	09-05-2017	R&D, Collaborative, Industry sponsored/ consultancy work
Principal Scientist	CSIR-Central Institute of Mining and Fuel Research, Dhanbad	10-05-2007	09-05-2011	R&D, Collaborative, Industry sponsored/ consultancy work
Scientist 'E-I'	Central Mining Research Institute (Presently, CSIR-Central Institute of Mining and Fuel Research), Dhanbad	10-05-2003	09-05-2007	R&D, Collaborative, Industry sponsored/ consultancy work
Scientist 'C'	Central Mining Research Institute (Presently, CSIR-Central Institute of Mining and Fuel Research), Dhanbad	10-05-1999	09-05-2003	R&D, Collaborative, Industry sponsored/ consultancy work
Scientist 'B'	Central Mining Research Institute (Presently, CSIR-Central Institute of Mining and Fuel Research), Dhanbad	10-05-1994	09-05-1999	Research & Development (R&D), Collaborative, Industry sponsored/ consultancy work

EDUCATIONAL QUALIFICATIONS (GRADUATION ONWARDS)

Year	Degree/Examination	Discipline	University/Institute	Remarks
2010	PhD	Mining Engineering	Bengal Engineering and Science University (Presently, IIEST), Shibpur	Developed a method of mining
1997	Master of Technology	Mining Engineering	Indian Institute of Technology, Kharagpur	MHRD Scholarship
1993	Bachelor of Engineering	Mining Engineering	Bengal Engineering College under Calcutta University (Presently, IIEST), Shibpur	First Class

AREA OF RESEARCH

His research interest is in the field of rock mechanics, ground control, computational geomechanics, underground mining methods, numerical modelling, strata control and management, stability analysis, instrumentation and monitoring of underground structures related to the coal and non-coal/metal mining activities. His aim is to develop safe and efficient mining methods for extraction of coal and non-coal/metal from underground mines with due consideration to the production, productivity and conservation including addressing the underground mining problems.

ACADEMIC ACTIVITIES

- **Activities of Academy of Scientific & Innovative Research (AcSIR), Delhi (acsir.res.in):**
  - Professor, Academy of Scientific & Innovative Research (AcSIR), Delhi in the Faculty of Engineering Science from 2016 - Continuing.
  - Associate Professor, AcSIR, Delhi in the Faculty of Engineering Science from 2012 to 2016.
  - Programme Coordinator of Integrated M.Tech-PhD Programme of AcSIR at CSIR-CIMFR, Dhanbad from 2012-2013.
  - Programme Coordinator of PhD Programme in Engineering of AcSIR at CSIR-CIMFR, Dhanbad from 2013-2016.
  - Course Coordinator of the four subjects of Mine Safety Engineering, Integrated M.Tech-PhD Programme and PhD Programme in Engineering of AcSIR at CSIR-CIMFR, Dhanbad:
    - Rock Mechanics and Ground Control in Mining
    - Rock Mechanics Instrumentation and Monitoring
    - Numerical Simulation and Stability Evaluation of Mining Structures
    - Advanced Numerical Modelling for Design of Underground Mining Structures

- **M.TECH. Thesis/Dissertation Supervised/Degree Awarded: 04**

- **PhD Thesis/Dissertation is being Supervised/in Progress: 04**

AWARDS / CERTIFICATES

- CSIR Golden Jubilee – CMRI Whitaker Award for 2000-2001 for the outstanding contribution of the research and developments in the mining and the cognate areas.
- Silver Medal of the Mining Geological & Metallurgical Institute of India (MGMI), 2005-2006.
- Hindustan Zinc Limited Prize of the Institution of Engineers (India), 2007-2008.

- DNV, Netherlands certified Internal Auditor of ISO 9001 Quality Management System for the efficient functioning of the organization.
- PhD Thesis selected as the best PhD thesis in India by the Indian National Group of International Society Rock Mechanics (ISRM) and nominated for the "Rocha Medal" of ISRM from India for the award of 2013.
- *Certificate of outstanding contribution in reviewing in recognition of the contributions made to the quality of the journal by the Editors of International Journal of Rock Mechanics and Mining Sciences, Elsevier, Amsterdam, the Netherlands.*

PATENT FILED/GRANTED

	Tittle	Date of filing	Application No./ Patent No. (Grant date)	Other inventors
1.	A device useful for supporting the underground mine side wall for highly dipping mine having pillars with acute angles corners.	08/03/2018	201811008499	A. Kushwaha, S. Tewari, R. Bhattacharjee, A. J. Das
2.	Wireless strata information system for underground openings.	08/10/2013	2993/DEL/2013	A. Kushwaha, P. K. Mishra, A. Sinha
3.	A novel method of mining for underground extraction of coal from a critically thick coal seam standing on pillars and development made along the roof horizon.	15/02/2002	2156492 (8/02/2008)	R. Singh, A. K. Singh
4.	A novel method for underground extraction of coal from contiguous seams/sections.	08/12/2000	222430 (08/08/2008)	T. N. Singh, B. K. Dubey, A. K. Singh

INTERNATIONAL COLLABORATION

Undertaken Joint S&T research project on "Rock mechanics investigations to meet the challenges of strata control of deep underground coal mining" under Bi-lateral Exchange Programme between the Academy of Sciences of the Czech Republic (ASCR), The Czech Republic and Council of Scientific & Industrial Research (CSIR), India (2009-2012).

FOREIGN VISITS

Country	Place	From	To	Purpose
Brazil	Foz do Igassu, Paraná	13-Sep-2019	18-Sep-2019	Participated in the International Congress of Rock Mechanics & Rock Engineering (ISRM 14th International Congress of Rock Mechanics), presented a paper in person and interacted with different experts participating in the conference.
United States of America	Morgantown, West Virginia	23-Jul-2016	31-Jul-2016	Participated in the 35th International Conference on Ground Control in Mining (ICGCM), presented a paper in person and interacted with different experts participating in the conference.
The Czech Republic	Ostrava-Poruba/ Prague	20-Oct-2009	05-Nov-2009	Participated in a joint research project under ASCR, Czech Republic - CSIR, India and interacted with scientists during 7th Czech-Polish Conference (CZPK'09) on Geology of Coal Basin at the Institute of Geonics, Ostrava-Poruba.

EDITOR/EDITORIAL BOARD MEMBER/REVIEWER OF JOURNALS

- Academic Editor of the International Journal "Advances in Civil Engineering" an SCIE Indexed Journal published by Hindawi, UK (https://www.hindawi.com/journals/ace/).
- Editorial Board Member of the Journal of Mines, Metals & Fuels, An SCOPUS Indexed Journal (http://www.jmmf.info/).
- Topic Editor of the International Journal "Sustainability" an SCIE Indexed Journal published by MDPI, Switzerland (https://www.mdpi.com/journal/sustainability/topic_editors).
- Editor of the proceedings volume "Advances in Mining", Proceedings of the National Conference on Advances in Mining (AIM-2020) held on February 14-15, 2020 at CSIR-CIMFR, Dhanbad.
- Reviewer of International Journal of Rock Mechanics and Mining Sciences, Elsevier.
- Reviewer of Rock Mechanics and Rock Engineering, Springer.
- Reviewer of Geomechanics and Engineering, Techno Press.
- Reviewer of Advances in Civil Engineering, Hindawi.

- Reviewer of IEEE Access, IEEE.
- Reviewer of Journal of Mines, Metals & Fuels, Books & Journals Pvt. Ltd.

ORGANISING SEMINAR/SYMPOSIUM/WORKSHOPS

- Advisory Committee Member and Panelist of the one day webinar on "Future of Mining Industries from Different Viewpoints- Post COVID Scenario" on July 19, 2020, at Kazi Nazrul University, Asansol.
- Organised (as a Convener) the National Conference on “Advances in Mining”, jointly organised by CSIR-Central Institute of Mining and Fuel Research and the Institution of Engineers (India), Dhanbad Local Centre during 14-15 February at CSIR-CIMFR, Dhanbad.
- Organised (as a Convener) a “Brain Storming Session and Industry Meet” for the Network Projects of CSIR on July 13, 2015, at CSIR-Central Institute of Mining and Fuel Research, Dhanbad.
- Organised "Innovation Day" at CSIR-Central Institute of Mining and Fuel Research, Dhanbad as a Convener of the programme.
- Organised (as a Convener), ISRM National Seminar on “Meeting Rock Mechanics Challenge of Deep Underground Mining” during 22-24 April, 2010 at CSIR-CIMFR in collaboration with the International Society of Rock Mechanics (ISRM), India and Central Board of Irrigation and Power (CBIP), New Delhi.
- Organised a colloquium on “Measurement and analysis of mining-induced stress for strata control during underground coal mining” at Central Mining Research Institute (CMRI, presently, CIMFR) in November 2004.
- Organised a workshop on “Mining of thick coal seams developed on pillars with cable bolt support” at Central Mining Research Institute, Dhanbad, September 7, 1997.

DETAILS OF MEMBERSHIPS OF PROFESSIONAL BODIES

• Institution of Engineers (India)	Fellow
• International Society for Rock Mechanics	Member
• Mining, Geological and Metallurgical Institute of India	Life Member
• Indian Geotechnical Society	Life Member
• Mining Engineers’ Association of India	Life Member
• International Society for Rock Mechanics and Tunneling Technology	Life Member
• Indian Mining and Engineering Journal’s Readers Forum	Life Member

PAPERS / PUBLICATIONS

Summary of Publications

	Publication		Number
A.	Papers published in journals		55
B.	Papers published/presented in conferences/seminars/symposia/workshop etc.		96
	(a)	International	38
	(b)	National	58
C.	Books		01

Papers Published in Journals

(1) Tewari, S., Himanshu, V. K., Porathur, J. L., Bhattacharjee, R., Das, A. J., & **Mandal, P. K.** (2020). Exploitation of mica deposits at Nellore mica belt, Andhra Pradesh, India. *Current Science, 118*(4), 593-602.

(2) Das, A. J., **Mandal, P. K.,** Prakash, A., Roy, L. B., & Tewari, S. (2020). Underground extraction methodology of contiguous coal seams ensuring the safety of the parting and the surface structures. *Safety science, 121*, 215-230.

(3) Sabapathy, R., Paul, P. S., & **Mandal, P. K.** (2019). Evaluation of bump-proneness of underground coal mines using burst energy coefficient. *Arabian Journal of Geosciences, 12*(18), 579(1-16).

(4) Das, A. J., Mandal, P. K., Paul, P. S., Sinha, R. K., & Tewari, S. (2019). Assessment of the strength of inclined coal pillars through numerical modelling based on the ubiquitous joint model. *Rock Mechanics and Rock Engineering, 52*(10), 3691-3717.

(5) Das, A. J., **Mandal, P. K.,** Paul, P. S., & Sinha, R. K. (2019). Generalised analytical models for the strength of the inclined as well as the flat coal pillars using rock mass failure criterion. *Rock Mechanics and Rock Engineering, 52*(10), 3921-3946.

(6) Kushwaha, A., Tewari, S., **Mandal, P. K.,** Bhattacharjee, R., Das, A. J., & Singh, K. K. K. (2019). Stability evaluation of old and unapproachable underground mine workings below surface structures. *Journal of the Geological Society of India, 93*(3), 351-359.

(7) Das, A. J., **Mandal, P. K.,** Sahu, S. P., Kushwaha, A., Bhattacharjee, R., & Tewari, S. (2018). Evaluation of the effect of fault on the stability of underground workings of coal mine through DEM and statistical analysis. *Journal of the Geological Society of India, 92*(6), 732-742.

(8) **Mandal, P. K.,** Das, A. J., Kumar, N., Bhattacharjee, R., Tewari, S., & Kushwaha, A. (2018). Assessment of roof convergence during driving roadways in underground coal

mines by continuous miner. *International Journal of Rock Mechanics and Mining Sciences, 108*, 169-178.

(9) Kumar, S., Mishra, P. K., & Mandal, P. K. (2018). Study of detection techniques for heating of coal in underground coal mines. The Indian Mining & Engineering Journal, 57(10), 29-34.

(10) Mishra, P. K., Kumar, M., Kumar, S., & **Mandal, P. K.** (2018). Wireless real-time sensing platform using vibrating wire-based geotechnical sensor for underground coal mines. *Sensors and Actuators A: Physical, 269*, 212-217.

(11) Raja, S., **Mandal, P. K.,** Paul, P. S., & Das, A. J. (2018). Prediction of coal bump with respect to local mine stiffness and post-failure stiffness using numerical modelling. *Journal of Mines, Metals and Fuels, 66*(6), 328-338.

(12) Das, A. J., **Mandal, P. K.,** Paul, P. S., & Sinha, R. K. (2018). Strategies for underground extraction of the inclined coal seams by continuous miner. MGMI Transactions, 114, 1-12.

(13) Das, A. J., **Mandal, P. K.,** Bhattacharjee, R., Tiwari, S., Kushwaha, A., & Roy, L. B. (2017). Evaluation of stability of underground workings for exploitation of an inclined coal seam by the ubiquitous joint model. *International Journal of Rock Mechanics and Mining Sciences, 93*, 101-114.

(14) Das, A. J., **Mandal, P. K.,** Ghosh, C. N., & Sinha, A. (2017). Extraction of locked-up coal by strengthening of rib pillars with FRP–A comparative study through numerical modelling. *International Journal of Mining Science and Technology, 27*(2), 261-267.

(15) Kushwaha, A., Bhattacharjee, R., Tewari, S., & **Mandal, P. K.** (2016). Role of geological discontinuities during application of continuous miner technology in underground coal mines. *Journal of Mines, Metals & Fuels, 6*4(9), 395-405.

(16) Mishra, P. K., Pratik, Sharma, A., Pandey, P., & **Mandal, P. K.** (2016). Quadcopter-An aerial support system for mining industry. *Geominetech: The Indian Mineral Industry Journal*, 3(02), 71-73.

(17) Agrawal, H., Singh, S. K., **Mandal, P. K.,** & Singh, A. P. (2015). 3-Dimensional numerical modelling: an effective enabler for CM deployment in coal seams. *Journal of Mines, Metals and Fuels, 63*(5&6), 111-118.

(18) Mishra, P. K., Mandal, C., Jaiswal, A., & Mandal, P. K. (2014). Simulation study of 13.56 MHz loop antenna: potential application in underground mines. *The Indian Mining & Engineering Journal, 53*(10), 13-15.

(19) Das, A. J., **Mandal, P. K.,** Kumbhakar, D. & Mishra, P. K. (2014): Effects of rib pillars at higher depth of working: A numerical modelling based study. *Mining Engineers' Journal, 16*(2), 23-30.

(20) Das, A. J., **Mandal, P. K.,** Ghosh, C. N., & Sinha, A. (2014). An Attempt to develop a technology for extraction of locked-up coal from underground mines using artificial

pillars. *The Indian Mining & Engineering Journal, 53*(5), 18-25.

(21) Mishra, P. K., **Mandal, P. K.,** Kumar, S., & Sinha, A. (2013). Machine to machine communication vis-a-vis safety in underground coal mines. *Minetech, 34*(1), 3-10.

(22) Singh, A. K., Singh, R., Maiti, J., Kumar, R., & **Mandal, P. K.** (2011). Assessment of mining induced stress development over coal pillars during depillaring. *International Journal of Rock Mechanics and Mining Sciences, 48*(5), 805-818.

(23) Singh, R., Singh, A. K., Maiti, J., **Mandal, P. K.,** Singh, R., & Kumar, R. (2011). An observational approach for assessment of dynamic loading during underground coal pillar extraction. *International Journal of Rock Mechanics and Mining Sciences, 48*(5), 794-804.

(24) Singh, R., **Mandal, P. K.,** Singh, A. K., Kumar, R., & Sinha, A. (2011). Coal pillar extraction at deep cover: with special reference to Indian coalfields. *International Journal of Coal Geology, 86*(2-3), 276-288.

(25) Singh, A. K., Singh, R., **Mandal, P. K.,** Kumar, R., Singh, A. K., & Ram, S. (2009). Rock mechanics challenges of depillaring at deep cover. *Journal of Mines, Metals & Fuels, 57*(9), 298-306.

(26) **Mandal, P. K.,** Singh, R., Maiti, J., Singh, A. K., Kumar, R., & Sinha, A. (2008). Underpinning-based simultaneous extraction of contiguous sections of a thick coal seam under weak and laminated parting. *International Journal of Rock Mechanics and Mining Sciences, 45*(1), 11-28.

(27) Singh, R., **Mandal, P. K.,** Singh, A. K., Kumar, R., Maiti, J., & Ghosh, A. K. (2008). Upshot of strata movement during underground mining of a thick coal seam below hilly terrain. *International Journal of Rock Mechanics and Mining Sciences, 45*(1), 29-46.

(28) Singh, R., **Mandal, P. K.,** Singh, A. K., Kumar, R., & Sinha, A. (2008). Optimal underground extraction of coal at shallow cover beneath surface/subsurface objects: Indian practices. *Rock mechanics and Rock engineering, 41*(3), 421-444.

(29) Maiti, J., **Mandal, P. K.,** Singh, R., & Kumar, B. M. (2006). Impact of stress redistribution on stability of workings during depillaring. *IE(I) Journal (MN), 87*, 10-22.

(30) **Mandal, P. K.,** Singh, R., Singh, A. K., Kumar, R., & Sinha, A. (2006). State-of-art vis-a-vis Indian scenario of application of continuous miner based mass production technology. *Journal of Mines, Metals & Fuels, 54*(12), 332-336.

(31) Prakash, A., Singh, A. K., **Mandal, P. K.,** & Singh, K. B. (2008). Damage to surface structures due to triggered subsidence - a case study. *Minetech, 29*(2), 17-24.

(32) Kumar, R., Singh, A. K., **Mandal, P. K.,** & Singh, R. (2007). Stability of pillars during underground extraction of thick coal seam in single lift – case studies. *Minetech, 28*(1), 3-10.

(33) Kunar, B. M., Maiti, J., & **Mandal, P. K.** (2007). Numerical modelling-based study in

bord and pillar workings - a prerequisite for support design in mines. *Minetech, 28*(1), 19-28.

(34) **Mandal, P. K.,** Singh, A. K., Kumar, R., & Singh, R. (2006). Instrumentation and monitoring strategies for study of ground movement during underground extraction of coal. *Mining Engineers' Journal, 8*(5), 15-27.

(35) Singh, R., **Mandal, P. K.,** Singh, A. K., Kumar, R., Ram, S., & Jena, S. K. (2006). Encountering induced horizontal stress during simultaneous depillaring of thick and contiguous section below hilly terrain: a case study. *MGMI Transactions, 102*(1&2), 37-61.

(36) **Mandal, P. K.,** Singh, A. K., Ram, S., Singh, A. K., Kumar, N., & Singh, R. (2004). Strata behaviour investigations of India's first depillaring face with continuous miner and shuttle car. *Minetech, 25*(6), 3-12.

(37) Singh, R., Singh, A. K., **Mandal, P. K.,** Singh, M. K., & Sinha, A. (2004). Instrumentation and monitoring of strata movement during underground mining of coal. *Minetech, 25*(5), 12-26.

(38) **Mandal, P. K.,** Singh, A. K., Ram, S., Singh, A. K., & Singh, R. (2004). Depillaring of a thick coal seam using cable bolts under shallow depth cover-A case study. *The Indian Mining & Engineering Journal, 43*(7), 11-18.

(39) Singh, R., **Mandal, P. K.,** & Singh, A. K. (2003). Partial extraction of coal at shallow cover. *The Indian Mining & Engineering Journal, 43*(2&3), 29-44.

(40) Singh, R., Singh, A. K., & Mandal, P. K. (2002). Cuttability of coal seams with igneous intrusions. *Engineering Geology, 67*(1-2), 127-137.

(41) Singh, A. K., Singh, R., & Mandal, P. K. (2002). Inclined slicing of a thick coal seam in ascending order-A case study. *CIM bulletin, 95*(1059), 124-128.

(42) Mandal, P. K., Singh, A. K., Buragohain, J., & Singh, R. (2002). A novel method of mining for underground winning of contiguous sections of a coal seam under fragile parting. *Journal of Mines, Metals & Fuels, 50*(1&2), 25-33.

(43) Singh, R., **Mandal, P. K.,** & Singh, A. K. (2002). Geo-technical considerations for long-term stability of developed coal seams below important surface features. *Minetech, 23*(6), 15-25.

(44) Singh, R., Singh, A. K., **Mandal, P. K.,** Kumar, R., Singh, O. P., & Buragohain, J. (2002). A novel method for underground extraction of a critically thick coal seam standing on pillars and the development made along the roof horizon. *Minetech, 23*(1&2), 3-12.

(45) Singh, R., **Mandal, P. K.,** Singh, A. K., & Singh, T. N. (2001). Cable-bolting-based semi-mechanised depillaring of a thick coal seam. *International Journal of Rock Mechanics and Mining Sciences, 38*(2), 245-257.

(46) Bagde, M. N., **Mandal, P. K.,** Singh, S. K., & Singh, T. N. (2001). Depillaring of developed pillars with cable bolt support at Nandan Mine No. 1. *Mining Engineers'*

Journal, 2(10), 11-18.

(47) Kumar, R., Singh, O. P., Singh, A. K., & **Mandal, P. K.** (2001). Development of mining induced stresses over the coal pillars facing goaf line-Case studies. *Minetech, 22*(4), 5-12.

(48) Singh, R., **Mandal, P. K.,** & Singh, A. K. (2000). Wide Stall Mining: A Method to Optimise Coal Recovery from a Seam under surface features. *Minetech, 21*(3&4), 10-17.

(49) Singh, R., **Mandal, P. K.,** & Singh, A. K. (2000). Cable bolt based mechanised depillaring of a thick coal seam. *Minetech, 21*(3&4), 3-9.

(50) **Mandal, P. K.,** & Maity, R. (2000). Microprocessor based real time monitoring for strata behaviour investigations in underground mines. *Minetech, 21*(2), 3-6.

(51) Singh, T. N., Dubey, B. K., & **Mandal, P. K**. (1999). A method for depillaring of thick seams standing on pillars with cable bolt support. *Journal of Scientific and Industrial Research, 58*, 422-430.

(52) Maity, R. & **Mandal, P. K.** (1999). Design aspects of low power intrinsically safe microprocessor based continuous monitoring system for safer mining applications. *Minetech, 20*(3), 43-46.

(53) Singh, T. N., & **Mandal, P. K.** (1999). A new method for depillaring of thick seam. *Journal of Coal Mining Technology and Management, 4*(6), 12-24.

(54) **Mandal, P. K.,** Sarkar, M., & Dubey, B. K. (1999). Importance of convergence/closure measurements during extraction of coal in underground mines. *Journal of Coal Mining Technology and Management, 4*(3), 1-8.

(55) **Mandal, P. K.,** Sarkar, M., & Singh, T. N. (1998). Role of instrumentation and instruments to study the strata behaviour during depillaring operation. *The Indian Mining & Engineering Journal, 37*(12), 31-38.

Papers Published in International Conferences/Seminars/Symposia

(1) Kumar, R., **Mandal, P. K.,** Singh, A. P., Kumar, L., & Singh, S. K. (2019). Extraction of deep-seated coal deposits using emerging underground mining methods. In: Proc. *8th Asian Mining Congress*, November 6-9, Kolkata, pp. 345-353.

(2) **Mandal, P. K.,** Das, A. J., Tewari S., Bhattacharjee, R. & Singh, S. K. (2019). Geomining issues for underground extraction of coal by continuous miner in India. In: Proc. *8th Asian Mining Congress*, November 6-9, Kolkata, pp. 277-286.

(3) **Mandal, P. K.,** Das, A. J., Tewari, S., Bhattacharjee, R., Kumar, L., & Singh, P. K. (2019). Stability Evaluation and Safe Designing of Barriers against Rivers in an Opencast Working - A Case Study. In: Rock Mechanics for Natural Resources and Infrastructure Development – Fontoura, Rocca & Pavón Mendoza (Eds), ISBN 978-0-

367-42284-4, *International Congress on Rock Mechanics and Rock Engineering*, Foz da Iguassu, Brazil, 13-18 September, pp.784-792.

(4) Das, A. J., Prakash, A., **Mandal, P. K.,** & Tewari, S. (2019). Design of extraction methodology of contiguous coal seams under surface structures. In: proc. int. conf. *International Conference and Exhibition on Energy & Environment: Challenges & Opportunities* (ENCO-2019), February 20-22, New Delhi, vol. II, pp. 808-818.

(5) Sabapathy, R., Paul, P. S., & **Mandal, P. K.** (2019). Assessment of Bump-Proneness of Underground Coal Mine by Strain Energy Using Numerical Modelling – A Case Study. In: proc. int. conf. *International Conference and Exhibition on Energy & Environment: Challenges & Opportunities* (ENCO-2019), February 20-22, New Delhi, vol. II, pp. 796-806.

(6) **Mandal, P. K.,** Das, A. J., Kushwaha, A., Tewari, S., & Bhattacharjee, R. (2018). Extraction of coal pillars by continuous miner under goaf at a higher depth of cover – A case study. *International Conference-cum-Exhibition, Mining Today 2018*, 14-17 February 2018, Hyderabad, India, 16 Pages.

(7) Das, A. J., **Mandal, P. K.,** Paul, P. S., Sinha, R. K., Kushwaha, A., & Tewari, S. (2017). Effect of the strata inclination during underground extraction of the inclined coal seams. In: proc. *7th Asian Mining Congress*, 8-10 November, Kolkata, India, pp. 223-238.

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BOOK PUBLISHED

Das, A. J., & **Mandal, P. K.** (2015). Underground extraction of Locked-Up coal: Numerical modelling based studies. Lambert Academic Publishing, Germany, ISBN: 978-3-659-80250-8, 2015, 6 Chapters, 172 pages.

INTERNATIONAL COLLABORATIVE PROJECTS

Sl. No.	Project title	Role	Total cost of the project (Rupees in Lakh)
1.	Rock mechanics investigations to meet challenges of strata control of deep underground coal mining (A project	Investigator/ Participant	30.000

	under Bi-lateral Exchange Programme between ASCR, The Czech Republic - CSIR, India)		

MAJOR GRAND-IN-AID/NETWORK PROJECTS FUNDED BY GOVT. OF INDIA/GOVT. COMPANIES

Sl. No.	Project title	Role	Total cost of the project (Rupees in lakh)
1.	Development of digital mine using Internet of Things (Funded by Ministry of Electronics and Information Technology) [Running]	Member	222.300
2.	Development of a technology for optimal extraction of locked-up coal from underground mines using artificial pillars (A 12th Five Year Plan Network Project) [Year of completion: 2017]	Nodal Officer and Activity/Task Leader)	1897.520
3.	Development of suitable design methodology for extraction of coal at greater depths (>300 m) for Indian geomining conditions (A 12th Five Year Plan Network Project) [Year of completion: 2017]	Activity Leader/Task Leader	2106.248
4.	Robotics and Micro Machines (A Mega Network Project under 12th Five Year Plan) [Year of completion: 2017]	Activity/Task Leader)	6916.978
5.	Development of tele-robotics and remote operation technology for underground coal mines (A Grant-in-Aid Project by funded by Ministry of Coal, Govt. of India) [Running]	Project Leader	453.020
6.	To find a methodology of safe liquidation in thick seams of Raniganj Coalfields: Design, development & show-casing demonstrative trials at Khottadih Colliery, ECL (A Grant-in-Aid Project by Coal India Limited R&D Board, India) [Year of completion: 2016]	Project Leader	41.066
7.	Development of a mining method for final extraction of a critically thick coal seam standing on pillars and development made along the roof horizon (A Grant-in-Aid Project by funded by Ministry of Coal, Govt. of India) [Year of completion: 2006]	Project Leader	24.30

8.	Development of model vis-a-vis study of parameters influencing abutment loading of pillars at a depillaring face of shallow depth cover and under massive roof strata (A Grant-in-Aid Project by funded by Ministry of Coal, Govt. of India) [Year of completion: 2003]	Principal Investigator	40.460
9.	Mechanised depillaring of 6m thick III seam of Chirimiri Colliery with cable bolted support (A Grant-in-Aid Project by funded by Ministry of Coal, Govt. of India) [Year of completion: 1995]	Member	213.250

MAJOR INDUSTRY FUNDED PROJECTS

Dr. Mandal has successfully completed more than 170 industry funded sponsored and consultancy projects as a consultant in different capacity, like Project Coordinator, Project Leader or the member of the team. Some of the projects are given below:

Sl. No.	Project title	Sponsoring company	Role
1.	Advice for design of extraction methodology for development and depillaring of Sector-F of RVII and RVIIA seams using Low Height Continuous Miner (LHCM) at 3&4 Incline, Jhanjra Project Colliery, ECL.	Gainwell Commosales Private Limited	Project Leader
2.	Advice for depillaring of 15 East Panel by Continuous Miner Technology in East Block of Churcha Mine (RO), Baikunthpur Area, SECL	GMMCO Ltd.	Project Coordinator
3.	Advice for the preparation of SCAMP for Bhanora west block Colliery, Sripur Area EC	Eastern Coalfields Limited	Project Coordinator
4.	Advice for depillaring of 16 East panel by continuous miner (CM) Technology in East Block of Churcha mine(RO), Baikunthpur Area, SECL	GMMCO Ltd.	Project Coordinator
5.	Scientific study to assess and design the barrier against Pusai River to avoid chances of sliding down of barrier along interface with Gopinathpur seam, Gopinathpur colliery, ECL.	Eastern Coalfields Limited	Project Leader
6.	Advice for preparation, formulation & implementation of SCAMP as per CMR-2017 (123) for depilling of panel No. 45 of No. 3 seam NCPH colliery R-6 mine. Chirimiri area, SECL	South Eastern Coalfields Limited	Project Coordinator
7.	Advice for the preparation and formulation of Strata	Mahanadi	Project

	Control and Monitoring Plan (SCAMP) as per Reg. 123 of CMR 2017 of Hirakund Bundia Mine, Orient Area, MCL	Coalfields limited	Coordinator
8.	Instrumentation and strata monitoring of continuous miner working during development/depillaring operation in RVI seam at MIC, Jhanjra Colliery, ECL	Gainwell Commosales Private Limited	Project Coordinator
9.	Scientific study on strata monitoring of development workings in Salarjung seam at Shanthikhani mine with CM technology, Mandamari area, SCCL	Singareni Collieries Company Limited	Project Leader
10.	Assessment of support requirement for development of RVII and RVIIA seam by LHCM at 3&4 incline of Jhanjra Project Colliery, ECL and recommendations thereof	Gainwell Commosales Private Limited	Project Leader
11.	Instrumentation and strata monitoring of low high continuous miner projects at Jhanjra 3 &4 mine in seam RVII and RVIIA of Jhanjra Project Colliery, ECL	Gainwell Commosales Private Limited	Project Leader
12.	Advice for Preparation of Strata Control and Monitoring Plan (SCAMP) for the Development of VIII Seam of 6&7 Pits Bhutgoria Amalgamated Colliery, Tata Steel Limited	Tata Steel Limited	Project Leader
13.	Advice for Preparation of Strata Control and Monitoring Plan (SCAMP) for the Extraction of XV/4-S Panel in XV Seam of Jamadoba Colliery, Tata Steel Limited	Tata Steel Limited	Project Leader
14.	Instrumentation plan and strata monitoring during extraction of pillars in the proposed CMP-11 panel [consisting sub panels CMP-11A(1), CMP-11A(2), CMP-11A(3)] using Continuous Miner technology at VK7 Incline, Kothagudem area, SCCL	Singareni Collieries Company Limited	Project Coordinator
15.	Advice on scientific study for feasibility of extraction of dev. Pillars in the proposed CMP-11 panel [consisting sub panels CMP-11A(1), CMP-11A(2), CMP-11A(3)] in King seam below caved goaf and barrier of top seam by Continuous miner technology at VK7 Incline, Kothagudem area, SCCL	Singareni Collieries Company Limited	Project Coordinator
16.	Advice on study for depillaring of 124LW panel by Continuous Miner (CM) Technology in the East Block of Churcha Mine (RO), Baikunthpur Area,	GMMCO Ltd.	Project Coordinator

	SECL		
17.	Scientific study for ascertaining the thickness of crown pillar below 85mRL to -39mRL at different levels with stop height of 50m at Mahagiri Mines (Chromite) in Sukinda Valley of M/s IMFA.	IMFA Ltd.	Member
18.	Advice on mining/geotechnical sequence during stopping at Rampura agucha u/g mine, HZL	Hindustan Zinc Limited	Project Coordinator
19.	Instrumentation and strata monitoring during stoping at Rampura agucha u/g mine, HZL	Hindustan Zinc Limited	Project Coordinator
20.	Advice for Preparation of Strata Control and Monitoring Plan (SCAMP) for the Development of XI Seam of Jamadoba Colliery, Tata Steel Limited	Tata Steel Limited	Project Leader
21.	Advice on feasibility of underground mining of marble with suitable cross-section of gallery opening and pillars at Zarivav Marble Mine, Ambaji, Gujarat	DKT & Sons, Ambaji, Gujarat	Project Coordinator
22.	Advice for feasibility study of depillaring in 18 LW panel of LK-II seam at Bartarai colliery, Jamuna Kotma area, SECL	SECL	Project Coordinator
23.	Advice for design of extraction methodology for development and depillaring workings of King seam at PVK-5 Incline mine, SCCL for the designated CM project area of Gainwell Commosales Private Limited	Gainwell Commosales Private Limited	Project Coordinator
24.	Advice of strata monitoring instrumentation and preparation of instrumentation plan of R-V seam at Khottadih colliery, ECL	Eastern Coalfields Limited	Project Coordinator
25.	Instrumentation plan and strata monitoring during extraction of pillars in the proposed CMP-10 panel [consisting sub panels CMP-10A(1), CMP-10A(2), CMP-10A(3)] using Continuous Miner technology at VK-7 Incline, Kothagudem area, SCCL	Singareni Collieries Company Limited	Project Coordinator
26.	Advice on scientific study for feasibility of extraction of dev. Pillars in the proposed CMP-11 panel [consisting sub panels CMP-101A(1), CMP-11A(2), CMP-11A(3)] in King seam below caved goaf and barrier of top seam by Continuous miner technology at VK-7 Incline, Kothagudem area, SCCL	Singareni Collieries Company Limited	Project Coordinator
27.	Advice for preparation of strata control and monitoring plan (SCAMP) as per CMR 123 of CMR 2017 for XI seam of PB project colliery, BCCL	Bharat Coking Coal Limited	Member

28.	Instrumentation and Strata Monitoring during drivage of two inclines, Interconnections and one inset in seam IV and III at Bicharpur underground coal mine, Shahdol, MP	Gainwell Commosales Private Limited	Project Coordinator
29.	Assessment of support requirement for development of RVII and RVIIA seam by LHCM at 3&4 incline of Jhanjra project colliery, ECL and recommendations thereof.	Gainwell Commosales Private Limited	Project Coordinator
30.	Instrumentation and strata monitoring of low high continuous miner projects at Jhanjra 3 &4 mine in seam RVII and RVIIA of Jhanjra Project Colliery, ECL	Gainwell Commosales Private Limited	Project Coordinator
31.	Advice on regional stability while extracting Longwall (14 to 17) block including sequence of extraction in XIV seam at Jitpur colliery of SAIL	Steel Authority of India	Member
32.	Advice on scientific study for feasibility of extraction of dev. Pillars in the proposed CMP-10 panel [consisting sub panels CMP-10A(1), CMP-10A(2), CMP-10A(3)] in King seam below caved goaf and barrier of top seam by Continuous miner technology at VK7 Incline, Kothagudem area, SCCL	Singareni Collieries Company Limited	Project Leader
33.	Scientific study on strata monitoring of development workings in Salarjung seam at Shantikhani Mine with Continuous miner technology, Mandamarri Area, SCCL	Singareni Collieries Company Limited	Project Leader
34.	Advice on strata monitoring data and establishment of cut-out distance in CM panel of Salarjung seam at Shantikhani mine, Mandamarri area, SCCL	Singareni Collieries Company Limited	Project Leader
35.	Advice on scientific study for extraction of thick seam as well as suitable method for systematic liquidation of area standing on pillars at Orient Mine No. I & II, MCL.	Mahanadi Coalfields Limited	Project Leader
36.	Monitoring of strata during development of LCCM panel in seam No.-II at Rani Atari u/g mine, Rani Atari sub area (Chirimiri area), SECL	South Eastern Coalfields Limited	Project Leader
37.	Scientific study to assess and design of barrier against Pussai River to avoid chances of sliding down of barrier along interface with Gopinathpur Colliery, ECL	Eastern Coalfields Limited	Project Leader

38.	Scientific study for ascertaining the thickness of crown pillar below 85mRL to -39mRL at different levels with stop height of 50m at Mahagiri Mines (Chromite) in Sukinda Valley of M/s IMFA	IMFA	Member
39.	Advice on evaluation of load bearing capacity of floor in order to decide suitability of deployment of Continuous Miner and other machineries in R-VI seam at Khottadih Colliery, ECL	Eastern Coalfields Limited	Member
40.	Scientific study to liquidate (development and depillaring) the Salarjung seam in identified patches at Shantikhani mine with Continuous Miner technology, Mandamarri area, SCCL	Singareni Colliery Company Limited	Project Leader
41.	Feasibility of extraction with 14 seam below the developed galleries of No. 14 seam (Top) and maximising percentage of extraction of 13 and 14 seams with controlled effect on the floor of upper workout seam at Bhelatand (A) Colliery, Tata Steel	Tata Steel Limited	Project Leader
42.	Scientific Study for auditing of "Ground Control Management Plan" of Kayad Mine M/S Hindustan Zinc Limited, Rajasthan, India	Hindustan Zinc Limited	Project Leader
43.	Scientific study for "Review of Ground Control Management Plan", of Rampura Agucha Mines of M/S Hindustan Zinc Limited, Rajasthan, India	Hindustan Zinc Limited	Member
44.	Scientific study for depillaring of panels with hydraulic sand stowing using LHD/SDL/Manual loading in XVI seam at Digwadih colliery, Tata Stee	Tata Steel Limited	Project Leader
45.	Advice for possible method of coal extraction in Dishergarh seam (R-IV) at Chinakuri Mine No. 1., ECL	Eastern Coalfields Limited	Member
46.	Advice for extraction of developed pillars by the Continuous Miner in the proposed CM Sub Panels-14, 15 & 16 in R-VII Seam of Sarpi Project, SSPur Colliery, Bankola Area, ECL	Eastern Coalfields Limited	Member
47.	Instrumentation plan and strata monitoring during extraction of pillars in the proposed CMP-9A(1) and 9A(2) using continuous minar technology at VK-7 incline Kothagudem area, SCCL	Singareni Collieries Company Limited	Member
48.	Scientific study for feasibility of extraction of developed pillars in the proposed in the CMP-9 panel [sub-panels CMP-9A(1) and CMP-9A(2)] in King	Singareni Collieries Company	Project Leader

	seam using CM Technology at VK-7 Incline, SCCL	Limited	
49.	Scientific study for designing method of extraction, support system and strata monitoring during extraction in the proposed BG U and S panels at 21 Incline, Yellandu Area, SCCL	Singareni Collieries Company Limited	Project Leader
50.	Scientific study for design of continuous miner panels in No. 2 seam and Salarjung seam of Shantikhani mine, Mandamari Area, SCCL	Singareni Collieries Company Limited	Project Leader
51.	Scientific study for designing a suitable method for systematic liquidation of already developed contiguous working and further development of Orient Colliery Mine No. 3, Orient Area, MCL	Mahanadi Coalfields Limited	Member
52.	Geotechnical monitoring of U/G workings stability at Rampura Agucha Mine, HZL and Audit of RA U/G Mine for "Ground Control Management Plan" at HZL.	Hindustan Zinc Limited	Member
53.	Advice for development of Haldibari underground mine with deployment of Continuous Miner (CM) in Hasdeo Area of M/s SECL (C.G.)	South Eastern Coalfields Limited	Project Leader
54.	Instrumentation plan and strata monitoring during extraction of pillars in the proposed CMP-9 panel [subpanels CMP-9A(1), CMP-9A(2) and CMP-9A(3)] using Continuous Miner technology at VK-7 Incline, Kothagudem Area, SCCL	Singareni Collieries Company Limited	Member
55.	Instrumentation plan and strata monitoring during extraction of pillars BG U-S panel using blasting gallery methods at 21 Incline Yellandu Area, SCCL	Singareni Collieries Company Limited	Member
56.	Scientific study for feasibility of extraction of developed pillars in the proposed in the CMP-9 panel [sub-panels CMP-9A(1) and CMP-9A(2)] in King seam using CM Technology at VK-7 Incline, SCCL	Singareni Collieries Company Limited	Project Leader
57.	Assessment and Advice on "Strata behaviour during extraction of developed pillars in CMP-8 panel using CM Technology at VK7 Incline, SCCL	Singareni Collieries Company Limited	Member
58.	Strata behaviour study for the extraction of developed pillars in 124 LE panel of Churcha Mine (RO), SECL with continuous Miner deployment and	South Eastern Coalfields Limited	Member

	support design		
59.	Advice for possible method of coal extraction in Dishergarh seam (R-IV) at Chinakuri Mine No. 1., ECL	Eastern Coalfields Limited	Member
60.	Scientific study for designing method of extraction, support system and strata monitoring during extraction in the proposed BG U and S panels at 21 Incline, Yellandu Area, SCCL	The Singareni Collieries Company Limited	Project Leader
61.	Scientific study for design of continuous miner panels in No. 2 seam and Salarjung seam of Shantikhani mine, Mandamari Area, SCCL	The Singareni Collieries Company Limited	Project Leader
62.	Scientific study for designing a suitable method for systematic liquidation of already developed contiguous working and further development of Orient Colliery Mine No. 3, Orient Area, MCL	Mahanadi Coalfields Limited	Member
63.	Advice for development of Haldibari underground mine with deployment of Continuous Miner (CM) in Hasdeo Area of M/s SECL (C.G.)	JMS Mining Private Limited	Project Leader
64.	Scientific study for feasibility of extraction of developed pillars in CMP-8 panel in King Seam below caved LW panels and caved goaf of Top Seam at VK-7 Incline, SCCL	The Singareni Collieries Company Limited	Member
65.	Scientific study for cavability aspect of massive Deccan trap roof formation and installation of suitable geotechnical instruments at Mauri Mine, Kanhan Area, WCL	Western Coalfields Limited	Member
66.	Advice on design of stooks, slices and ribs in the proposed CM Panel in R-VII Seam, Sarpi Project of Bankola area for the extraction of developed pillars, ECL	Eastern Coalfields Limited	Member
67.	Scientific study for method of working and sequence of extraction of existing developed and virgin section of HR seam at Hirakhand Bundiya Mine, Orient Area, MCL	Mahanadi Coalfields Limited	Project Leader
68.	Advice for depillaring of R-VI seam with deployment of continuous miner including support design, considering increased height and width of extraction at Khottadih Colliery, ECL	Eastern Coalfields Limited	Project Leader
69.	Advice on extraction of developed pillars in 124 LW	South Eastern	Project

	panel of Churcha Mine (RO), SECL with continuous Miner deployment and support design	Coalfields Limited	Leader
70.	Scientific study for introduction of continuous miner technology and design of development workings at Vijay West U/g mine, SECL	JMS Mining Private Limited	Project Leader
71.	Feasibility study for extraction of pillar in contiguous V seam and VI seam of 23/8 incline, Bhowrah (N) Underground Mine, BCCL	Bharat Coking Coal Limited	Project Leader
72.	Scientific study for determination of size of split and slice galleries for depillaring with deployment of SDL at EF Incline (10' seam) of Sawang Colliery, Kathara Area, CCL	Central Coalfields Limited	Project Leader
73.	Evaluation of roof rock behaviour for depillaring T9 panel at Tandsi 3 & 4 incline, Kanhan Area, Western Coalfields Limited	Western Coalfields Limited	Project Leader
74.	Scientific study for depillaring of T9 Panel and support design at Tandsi 3 & 4 Inclines, Kanhan Area, Western coalfields Limited	Western Coalfields Limited	Project Leader
75.	Scientific study related to Strata control problems at IX/2-S panel of IX seam at Digwadih Colliery of M/S Tata Steel Ltd.	Tata Steel Limited	Project Leader
76.	Feasibility of underground and mixed mining method in Palana Lignite Mine project of Neyveli Lignite Corporation Ltd.: A rock mechanics study	Neyveli Lignite Corporation Limited	Member
77.	Scientific study for assessing the impact of overlying LW panels on the stability of pillars/stooks in BG panels nos. 4, 5, 6 of 3 seam and design of manner of extraction of 3 seam by BG method and extraction of stooks in 4 seam sand stowing panel at Vakilpalli mine, RG II Area, SCCL	Singareni Collieries Company Limited	Project Leader
78.	Instrumentation and monitoring in 3 seam of BG-4, BG-5 and BG-6 panels and in 4 seam SS-1 sand stowing panel during extraction at Vakilpalli Mine, RG II Area, SCCL	Singareni Collieries Company Limited	Project Leader
79.	Scientific study for feasibility of extraction with caving method in R-VI seam of Khottadih Colliery, ECL	Eastern Coalfields Limited	Project Leader
80.	Design of suitable method of depillaring including widening and heightening of existing galleries for	Singareni Collieries	Member

	working of panel BS of No. 1 seam at GDK-11 Incline mine, RG-I Area, SCCL along with underground instrumentation and monitoring during extraction of the panel.	Company Limited	
81.	Advice for safe depillaring of panel No. 26 of VK-7 Incline mine, Kothagudem Area, SCCL through underground instrumentation and monitoring	Singareni Collieries Company Limited	Project Leader
82.	Advice for safe depillaring of Blasting Gallery (BG) panel No. II/6 of No. 3 seam and study of effect of this panel on the already developed workings of No. 4 seam at GDK-8 Incline mine, SCCL through underground instrumentation and monitoring	Singareni Collieries Company Limited	Member
83.	Scientific investigation and advice for feasibility of the proposed Ring Road alignment over coal bearing areas around Dhanbad	National Highway Authority of India	Project Leader
84.	Advice for safe working of continuous miner depillaring panel of No. 1 seam at GDK-11A Incline mine Ramagundem Area-1, SCCL through underground instrumentation and monitoring	Singareni Collieries Company Limited	Member
85.	Performance evaluation of limited spam method for underground partial extraction of 50LN panel of Patpahari seam through underground instrumentation and monitoring at Bhatgaon, SECL	South Eastern Coalfields Limited	Project Leader
86.	Advice for safe depillaring of Panel A-1 of No. III seam by Blasting Gallery (BG) method at Anjan Hill Mine, Chirimiri Area, SECL	South Eastern Coalfields Limited	Member
87.	Design of suitable method of depillaring including widening and heightening of existing galleries for working of panel B4 of no. 1 seam at GDK-11 incline mine, RG-I area, SCCL along with underground instrumentation and monitoring during extraction of the panel	Singareni Collieries Company Limited	Project Leader
88.	Advice for Stability of workings beneath and within 45m of railway acquired land at New Majri Colliery No. 3 of Majri Area, WCL	Western Coalfields Limited	Member
89.	Advice for safe working of CM depillaring panel B3 of no. 1 seam at GDK-11 incline mine, RG-I area SCCL through underground instrumentation and monitoring	Singareni Collieries Company Limited	Member

90.	Depillaring of No. IX seam by Cable Bolting based depillaring method at Alkusa Colliery, Kustore Area, BCCL	Bharat Coking Coal Limited	Member
91.	Depillaring of Kajora top seam with Cable Bolt as high roof support in the panels K-10, K-11, K-11(A), K-11(A2), K-11(B), K-11C, K-11(D) and K-11(G) at Madhusudanpur 7 Pit and Incline Colliery, ECL	Eastern Coalfields Limited	Project Leader
92.	Scientific study for suggesting of appropriate method for final extraction of No. 3 seam at Bartunga Hill mine, Chirimiri Area, SECL	South Eastern Coalfields Limited	Project Leader
93.	Extraction of contiguous sections of Zero seam by Underpinning based depillaring method in the panels F1, F2, K7, K8 and K9 at Bartunga Hill Mine, SECL	South Eastern Coalfields Limited	Project Leader
94.	Advice for safe depillaring and strata behaviour study during depillaring of the panels F3, F4, G2, G3, J1, and K10 at Bartunga Hill mine, Chirimiri Area, SECL	South Eastern Coalfields Limited	Project Leader
95.	Strata behaviour study and performance evaluation during depillaring with Continuous Miner and Shuttle Car in the panels C, B and A at Anjan Hill Mine, Chirimiri Area, SECL.	South Eastern Coalfields Limited	Project Leader
96.	Depillaring of No. III seam by Blasting Gallery method in panels II/3, I/12, II/4 and II/5 at GDK-8 incline mine, RG-II Area, SCCL	Singareni Collieries Company Limited	Project Leader
97.	Depillaring of No. III seam by Blasting Gallery method in the panels 2B, 2C, 2E, 2F and 1C at GDK-10 Incline mine, RG-III Area, SCCL.	Singareni Collieries Company Limited	Project Leader
98.	Advice for safe depillaring and study of roof behaviour for safe working/extraction of thick seams by Blasting Gallery method in the panels No. 1A, 1B and 1C of GDK-11A Incline, SCCL	Singareni Collieries Company Limited	Team Member
99.	A suitable method of mining for extraction of No. III seam (panel 3B1) at Bartunga Hill Mine, Chirimiri Area, SECL.	South Eastern Coalfields Limited	Project Leader
100.	Caving characteristics of overlying strata and suitability of the proposed Blasting Gallery method	South Eastern Coalfields	Member

	for depillaring of No. III seam at Anjan Hill Mine, Chirimiri Area, SECL	Limited	
101.	Optimization of coal recovery from panel W-4(N-E) by Wide Stall method at Sarni mine, Pathakhera Area, WCL	Western Coalfields Limited	Project Leader
102.	Feasibility study for partial extraction of Kajora seam (R-IX) at Madhujore Colliery, Kajora Area, ECL	Eastern Coalfields Limited	Member
103.	Feasibility study for suitability of depillaring of panel 1A of 1 seam, where, both overlying 2 and 3 seams and underlying Zero seams are goaved out and the parting between 1 seam and underlying Zero seam is around 21m at Bera Colliery, Bastacola Area, BCCL	Bharat Coking Coal Limited	Project Leader
104.	Stability analysis of the old underground working below Sanctoria village, ECL	Eastern Coalfields Limited	Member
105.	Scientific study to ascertain the strength of the parting between Queen and King seams to sustain the pressure of water accumulated in King seam at No. 21 Incline and JK-5 Incline of Yellandu are, SCCL	Singareni Collieries Company Limited	Team Member
106.	Stability assessment of LT-1(B) Panel (XIII Seam) at Chasnalla colliery, IISCO during extraction of coal by Modified Jankowice method.	IISCO	Member
107.	Study of strata behaviour during depillaring of Johilla Top seam over developed Johilla Bottom Seam in Nowrozabad East Colliery, SECL	South Eastern Coalfields Limited	Project Leader
108.	Strata behaviour study during Wide Stall method of mining for coal seam under fragile ecology in Umaria Colliery, Johilla Area, SECL.	South Eastern Coalfields Limited	Member
109.	Feasibility of partial extraction of Karo Special III seam at New Selected Dhori Colliery (Dhori Area), CCL	Central Coalfields Limited	Member
110.	Partial Extraction Of Narainkuri (R-VII) Seam at Pure Searsole Colliery, Satgram Area, ECL	Eastern Coalfields Limited	Project Leader
111.	Feasibility for depillaring of bottom section of zero seam under standing pillars and collapsed galleries in top section at Chirimiri colliery, SECL	South Eastern Coalfields Limited	Member
112.	Strata Depillaring of Kajora Top seam with cable bolt as high roof support at Madhusudanpur 7 Pit and	Eastern Coalfields	Project Leader

	Incline Colliery, panel K-11(A2), ECL	Limited	
113.	Optimal extraction of Dishergarh (R IV) seam at Satgram Incline, ECL	Eastern Coalfields Limited	Member
114.	Strata behaviour study of the depillaring panel in IX seam by cable bolt as high roof support at Alkusa Colliery, Kustore Area, BCCL	Bharat Coking Coal Limited Member	Member
115.	Instrumentation and monitoring for optimal extraction of XIV seam at Jeetpur colliery	IISCO	Member
116.	Strata behaviour investigations of Johilla top seam at Nowrozabad East Colliery, SECL	South Eastern Coalfields Limited	Member
117.	Experimental trial for depillaring of thick contiguous sections of Zero seam at Chirimiri colliery by underpinning	South Eastern Coalfields Limited	Member
118.	Stabilisation between Bata More and Bus Stand of Jharia town on turnkey basis	Bharat Coking Coal Limited Member	Member

DECLARATION

I hereby declare that the above particulars are true to the best of my knowledge and belief.

Prabhat Kumar Mandal
Chief Scientist
CSIR-Central Institute of Mining and Fuel Research
Dhanbad, Jharkhand, India