Bio-data

1. *Name* : Rajendra Singh

2. *Date of birth* : January 20,1959

3. *Current position and Address* : Professor, Department of Mining Engineering
School of Mines and Metallurgy,
Kazi Nazrul University, Asansol, WB, 713340

Address-

(a) Official

Department of Mining Engineering
School of Mines and Metallurgy
Kazi Nazrul University
Asansol, WB, 713340
Phone (Mob) – (+91) 9334245661
Email- rsingh1_2@yahoo.com

(b) Residential

House No.C/18,
Nalanda Cottages, Hirak Road,
Hirak Point, Dhanbad,.
Jharkhand, 826004
Mob. 7541023909
Email - rsinghcimfr@gmail.com

4. *Educational Qualifications* :

S. No.	Degree/Certificate	Year of Passing	University/Institute	Subject	Class
i	B. Sc. with Honours	1978	Magadh University	Physics (Hons.)† Chem. Math.	1st
ii	M. Sc. in Physics	1980	Magadh University	Physics (Electronics Special)††	1st
iii	Ph.D.(Engineering)	1996	University College London#(UCL),	Geomatic Engineering†††	NA
iv	Post-DoctoralFellow	2011	Camborne School of Mines (CSM), UK	Rock Mechanics††††	NA

Generally, ranks among the top ten universities of the world. *(NA - Not Applicable)*

† **Stood first class second in the University with distinction in all subjects.**
†† **Recipient of the National Merit Scholarship.**
††† **Won the Commonwealth Scholarship of UK for the study.**
†††† **Recipient of the Commonwealth Academic Staff Fellowship of UK.**

5. *Academic/Research experience/Employment:*

S. No.	From	To	Name of Organisation	Position held
i	December, 1986	November, 1989	CSIR-CIMFR[1]	Junior Scientist/Scientist 'B'
ii	December, 1989	November, 1994	CSIR-CIMFR	Scientist/Scientist 'C'
iii	December, 1994	November, 1999	CSIR-CIMFR	Senior Scientist/Scientist 'EI'
iv	December, 1999	November, 2004	CSIR-CIMFR	Principal Scientist/Scientist 'EII'
v	December, 2004	November, 2009	CSIR-CIMFR	Senior Principal Scientist/Scientist 'F'
vi	December, 2009	January, 2019	CSIR-CIMFR	Chief Scientist/Scientist 'G'
vii	November, 2020	Till date	SMM, KNU	Professor
vii	*October, 1993*	*September, 1996*	UCL[2], UK	*Commonwealth Scholar*
viii	*November, 2010*	*May, 2011*	CSM[3], UK	*Honorary University Fellow*

[1] *Earlier Central Mining Research Institute (CMRI).*
[2] *Worked at UCL (University of London) for three years under Commonwealth Scholarship of UK (study leave from CSIR-CIMFR) and obtained Ph. D. degree.*
[3] *Worked as Honorary University Fellow at CSM (University of Exeter, UK) from November, 2010 to May, 2011(sabbatical leave from CSIR-CIMFR).*

6.*Area of Specialization* : Strata/Rock Mechanics, Underground Mining of Thick Coal Seams, Modelling and Simulation of Mining Structures, Cuttability of Coal Seams, and Digital photogrammetry.

7.*Honours/Awards/Recognitions received*:

Honours/Fellowships

- Honorary visiting Fellow at the University of Exeter (UK) under the *Commonwealth Academic Staff Fellowship*: 2010-2011.
- Awarded *the Commonwealth Scholarship/Fellowship* of UK: 1993-1996 to work at University College London leading to a Ph.D. degree.
- *National Merit Scholarship* recipient during post-graduation study

Awards

- Received the *CSIR-Golden Jubilee CMRI-Whitaker Award*, 1999-2000.
- Recipient of the *National Mineral Award*2002-2003(first among the present working scientists of CSIR-CIMFR to receive this Award), awarded annually by the Ministry of Mines, Government of India to the best performing academician in the field of "Mining Technology".

Medals/prizes

- *Gold card of Coal India Ltd. (CIL)* for the contribution towards growth of the Coal Industry, 1994.
- *Gold Medal of the Mining Geological & Metallurgical Institute of India (MGMI), 2003-2004.*
- *Silver Medal of the Mining Geological & Metallurgical Institute of India (MGMI), 2005-2006.*
- *Hindustan Zinc Limited Prize of the Institution of Engineers(India),* 2007**.**

Some of the professional institutions likeInternational Society of Rock Mechanics (ISRM), American Rock Mechanics Association (ARMA), Canadian Rock Mechanics Association (CRMA),ASCR, Czech Republicetc.sharedacademic responsibilities and honoured to chair technical sessions.

8. *Professional Affiliations*:

Professionally affiliated with following academic/professional bodies -

a.	International society of Rock Mechanics	Life Member
b.	Mining, Geological and Metallurgical Institute of India	Life Member
c.	National institute of Small Mines	Life Member
d.	Indian Society of Remote Sensing	Life Member

9. *List of Research Publications including popular articles (if any):*
A list of 142 papers, published/presented in different journals/proceedings/invited lectures, is attached. A break-up of these papers is given below:

i. Papers in journals: Sixty one (thirty two in foreign journals)
ii. Papers in conference proceedings: Seventy (Thirty eight in Proc. of Int. Conf.)
iii. Invited/popular addresses: Eleven, including three foreign invitations.

10. *List of best professional outputs/outcomes in last 10 years, relevant to present specialisation:*

My R&D efforts and management skill to lead a team of researchers resulted successful completion of important in-house and industry-sponsored projects (including eight S&T projects of the Ministry of Coal, Govt. of India and two international collaborations), development of some popular methods of mining for safe and clean extraction of difficult coal seams, appreciation from the associated industry and academicians, considerable number of publications in the best rock-mechanics/mining engineering journals and prestigious honours/awards of this area. My contributions are well proven and found to be of immense importance for excellence of production, productivity, safety and conservation. As per the feedbacks received from the industry, my developments have found perfect matching with the geo-mining conditions of Indian coalfields for techno-economic brilliance of the industry.

Based on some simple ideas and results of different field and laboratory investigations, following significant contributions are made:

a. Development of four *(two patented)* indigenous mining methods, (One is through individual effort & other three through Team work),
b. Development and effective execution of hard roof management system during mining under bump/rock bursts prone geo-mining conditions(Team work; International collaboration),
c. Empirical model to estimate coal pillar loading under shallow mining conditions, (Team work),
d. Cuttability model for hard coal seams with igneous intrusions, (Individual work),
e. Computer vision based system for monitoring hazardous areas of mines, (Individual work),
f. Simulation (Numerical and physical) and performance evaluation in field, (Team work),
g. Mechanisation & automation of underground instrumentation and monitoring (Team work), and
h. Optimisation of design of roof bolt based breaker line for a mechanised depillaring face utilizing continuous miner, (Team work).

An idea of impact of my development may be obtained from following two feedbacks: one given by the industry and the other by an academician.

About our developed Underpinning technology, practiced at Bartunga Hill Mines of SECL, to extract locked-up coal, *Chief General Manager, Chirimiri Area, SECL writes:*

"....Underpinning technology, thus, increased life and increased percentage of extraction and added mineable property of the mine in addition to manpower deployment opportunity. In addition to safety & production,Coal valued Rs. 200.0crores (approx.) has already been extracted...."

Further, while accepting one of our papers for publication in the *International Journal of Rock Mechanics*; Prof. Hudson, Chief Editor writes*:*

"*It is exactly the type of paper that we like to publish in the Journal because the work is of high quality and*....."*.They also awarded a "Certificate of Outstanding Contribution in Reviewing".*

Our recent effort to design a mechanised depillaring operationin the country (after withdrawal of the associated foreign expert) has made a ***nation record of coal production***.

A list of five good publications in last 10 yrs.:

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

- **R. Singh,** A. K. Singh, J. Maiti, P. K. Mandal, Rashmi Singh and R. Kumar, 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

- P. Konicek, K. Soucek, L. Stas and **R. Singh**, 2013. Long-hole de-stress blasting for rock-burst control during deep underground coal mining.*International Journal of Rock Mechanics & Mining Sciences*, **61**(2013): 141–153.

- **R. Singh**, A Kumar, A. K. Singh, J. Coggan and S. Ram. 2016. Rib/snook design in mechanised depillaring of rectangular/square pillars. *International Journal of Rock Mechanics and Mining Sciences,***84**(2016):119–129.

- Ashok Kumar, Peter Waclawik, **R. Singh**, Sahendra Ram and Jiri Korbel. Performance of a coal pillar at deeper cover: Field and simulation studies. *International Journal of Rock Mechanics and Mining Sciences.* 113(2019):322–332.

(c) Highlights of contributions to the area of socialization

As per my academic qualifications, R&D experiences and professional achievements (mentioned above), three highlights for my candidature are:

- Proven scientific, technical and management abilities and contributions,
- Consistently good academic/professional career with good national and international recognitions &
- Valuable expertise of strata mechanics in underground coal mining.

I initiated and successfully led major R&D projects in Engineering Rock Mechanics for safe and efficient mining of difficult coal seams. Led R&D teams for *in-situ testing*, numerical modelling and laboratory testing for rock-mass characterization& stress distribution studies to develop mining methods for deep, thick and contiguous coal seams. Diligence and thoroughness of my approach during these investigations, probably, made me able to devise some useful indigenous technologies for underground extraction of coal and to derive valuable empirical formulations for optimal design of the underground structures. I am working in close collaboration with the leading mining institutions of the country like IIT Kharagpur, IIT(ISM) Dhanbad, IIT(BHU) Varanasi and NITRourkela and professional organizations like ISRM (India), MGMI, etc. for better R&D results. My active effort and a valued R&D proposal fetched an opportunity for me to work in a prestigious project at University College London(UCL) under the Commonwealth Fellowship/ Scholarship plan of UK. Further, I was project leader of a recently completed joint research project under ASCR, Czech Republic - CSIR, India (2009-2014) on “Rock mechanics investigations to meet challenges of strata control of deep underground coal mining. I have also established good contact with the Camborne School of Mines (CSM), UK, where I worked as Honorary University Fellow**,** 2010-2011.

Under the favourable influence of enthusiasm, I successfully practiced basic theories of R&D management and tackled conditions specific problems to optimise resources, time and output during my supervision of different S&T projects. This made me bit matured to read the behaviour of different interfaces before deciding a suitable adoption in the approach. The department (Strata Mechanics) headed by me at CSIR-CIMFR (erstwhile CMRI), has continuously generated good external cash flow (per capita), produced large number of good quality research papers in the top-rated journals, patented some mining methods and continuously received appreciations from the industry and academicians.

11. *Highlights of contributions to the area of socialization*

As per my academic qualifications, R&D experiences and professional achievements (mentioned above), three highlights for my candidature are:

- Proven scientific, technical and management abilities and contributions,
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12. *No. of Books authored/edited*:

Edited two published proceedings of Seminars.

Manuscript of a book titled "Strata mechanics in underground extraction of coal pillars" is in progress.

Frequent reviewer of papers submitted for publication in different Geo-technical journals of country and abroad.

13. a. *No. of patents/Copy-right/Trade mark/IPR granted/applied for & highlights of translational research contributions*:

Following four patents and one Copyright are filed/granted:

Sl. No.	Inventors	Title	Country	Year	Number
1.	P. K. Mandal, **R. Singh**, T. N. Singh, B. K. Dubey and A. K. Singh	A novel method for underground extraction of coal from contiguous seams/sections	India	2000	222430
2.	**R. Singh**, P. K. Mandal and A. K. Singh	A novel method for underground extraction of coal from a critically thick coal seam standing on pillars and the development made along the roof horizon	India	2002	215649
3.	**R. Singh**, P. K. Mandal, A. K. Singh, R. Kumar, A. Sinha	Combined-Instrument-Approach (CIA) for analysis of underground instrumentation data." (Copyright).	India	2009	Copyright
4.	**R. Singh**, A. K. Singh, S. Ram, A. Kumar, R. Kumar, A. K. Singh.	A model for rib/snook design in mechanised depillaring under moderate roof strata	India	2015	3765DEL 2015 (Filed)
5.	S. Ram, **R. Singh,** D. Kumar, A. K. Singh, A. Kumar, R. Kumar, A. K. Singh.	A method for efficient design of roof bolt based breaker line support in mechanised depillaring	India	2017	0244NF2016 (Filed)

All the above mentioned methods/processes are being used extensively by the coal mining industry and with good techno-economic impact as mentioned above under *"list of professional outputs/outcomes"*. These developments are based on fundamental rock mechanics principles and large-scale investigations in field and laboratory. It is very difficult to have any "typical" geo-mining condition, which can be used as a benchmark to standardize different parameters associated with these developments. Therefore, all these developed technologies are directly provided to the mining industry by CSIR-CIMFR only *after a suitable endorsement/tuning in the design parameters* (as per the selected site conditions). The requirement of good knowledgebase of the rock-mass (natural material)

properties, geology and stress conditions for each implementation site are important inputs for the endorsement/tuning of these developed technologies. Therefore, it is difficult for a company to openly market these technologies for the industry and no license is issued to any industry, except their site-specific application.

Scientific and technical services, related to implementation of these developments under the given site conditions, have been rendered by CSIR-CIMFR (in terms of sponsored/ consultancy projects) to more than 100 coal mines with considerable success. We patented these methods due to their novelty and IPR for business purpose. Due to above discussed reasons, CSIR-CIMFR opted to provide these developments directly to the industry.

b. Technologies developed, Licensed and/or commercialised with details:

Developed following eight *(five patented)* mining methods and processes for efficient and safe underground coal mining -

a) Wide Stall mining for optimal recovery of coal from thick seams locked under the surface features.
b) Cable bolting based semi-mechanised depillaring of total thickness of a thick coal seam in single lift.
c) Staggered development of a thick coal seam (already developed along roof horizon) for full height working in single lift by blasting gallery method.
d) Underpinning based simultaneous extraction of contiguous sections of a thick coal seam consists of the weak and laminated parting.
e) Combined-Instrument-Approach (CIA) for analysis of underground instrumentation data for strata dynamic study during final extraction.
f) Empirical model to assess nature and amount of mining induced stress development over the coal pillars during a depillaring operation.
g) Design model for rib/snook in mechanised depillaring under moderate roof strata.
h) A method for efficient design of roof bolt based breaker line support in mechanised depillaring.

Under uniqueness constraint of the geo-mining conditions; these developed technologies are difficult to be directly licensed to a company but are commercialised on large scale with some adoptive changes in parameters under the supervision of this institute.

14. *Dissertation supervised*:

(a) Ph. D. :Supervised four doctoral theses and one more is on the verge of completion.

(b) Post Graduation: Guided a number of M. Tech. students of different institutions like AcSIR, IIT (ISM), IIT (Kgp), CSM(UK) etc. for their final dissertation theses.

15. *Future plan of study*

The ability of scientific and industrial research to address the problems of a common man is well recognised and, accordingly, academicians and researchers are playing a vital role for the transforming Indian society. Mining is one of the important sectors for Indian economy, where translational research: especially to promote and practice sustainable developments is important for the country. Economic growth driven energy demand is a primary concern in India, where coal is the major natural resource in the country to meet the growing energy demand. Nearly, 60% of the total energy consumption in the country is being met by coal, which is likely to grow further. It is projected that the dependency of energy necessity in the country on coal is likely to remain unchanged for, at least, next 20 years. At the moment, most of the coal requirement is being met by opencast mining. However, the coal reserve mineable by the opencast mining is exhausting and facing enormous environmental challenges. Therefore, a considerable growth in underground coal mining is expected to meet the increasing demand of coal. Accordingly, different futuristic areas of underground mining are planned to be investigated for development of a suitable underground coal mining method:

Signature of the Applicant

Date: November 27, 2020.
Place: Dhanbad.

List of Publications of Rajendra Singh

Foreign Journals and proceedings:

1. Rakesh Kumar, Arvind Kr. Mishra, Ashok Kumar, Arun Kr. Singh and **Rajendra Singh**, 2020. Hard roof management based single lift depillaring of total thickness of a thick coal seam. Communicated to Journal of the Geological Society of India.
2. Arun Kumar Singh, Ashok Kumar, Dheeraj Kumar, Rajendra Singh, Sahendra Ram, Rakesh Kumar and Amit Kumar Singh, 2020. Field and Simulation Studies for Mechanised Depillaring Below Weak and Laminated Geology in Indian Coalmines. Communicated to Journal of the Geological Society of India.
3. A.K. Singh, A. Kumar, D. Kumar, **Rajendra Singh**, S. Ram, R. Kumar, & AK Singh, Coal Pillar Extraction Under Weak Roof. *Mining, Metallurgy & Exploration* **37,** 1451–1459 (2020). https://doi.org/10.1007/s42461-020-00277-8
4. Ashok Kumar, Dheeraj Kumar, Arun Kumar Singh, Sahendra Ram, Rakesh Kumar, Abhishek Gautam, **Rajendra Singh**, Amit Kumar Singh. 2019. Roof sagging limit in an early warning system for safe coal pillar extraction. *International Journal of Rock Mechanics and Mining Sciences.* 123(2019): 104131. https://doi.org/10.1016/j.ijrmms.2019.104131
5. Ashok Kumar, Peter Waclawik, **Rajendra Singh**, Sahendra Ram and Jiri Korbel. Performance of a coal pillar at deeper cover: Field and simulation studies. *International Journal of Rock Mechanics and Mining Sciences.* 113(2019):322–332. doi.org/10.1016/j.ijrmms.2018.10.006
6. Ashok Kumar, Rakesh Kumar, Arun Kumar Singh, Sahendra Ram, Pradeep Kumar Singh & **Rajendra Singh**, 2017. Numerical modelling-based pillar strength estimation for an increased height of extraction. Arabian Journal of Geosciences, Vol. 10, Issue. 18. (20th September, 2017) doi: 10.1007/s12517-017-3179-6.
7. Singh R., Ram S., Singh A. K., Kumar A., Kumar R., Singh A. K. 2017. Rock Mechanics Considerations for Roof Bolt-Based Breaker Line Design.*Procedia Engineering*, 191**, 2017: 551-559**.
8. Ram, S., Kumar, D., Singh A. K., Kumar, A. and **Singh, R. 2017.** Field and laboratory studies for an efficient placement of roof bolts as breaker line support.*International Journal of Rock Mechanics and Mining Sciences*,93(2017):152–162.
9. **R. Singh**, A Kumar, A. K. Singh, J. Coggan and S. Ram. 2016. Rib/snook designin mechanised depillaring of rectangular/square pillars. *International Journal of Rock Mechanics and Mining Sciences*,84(2016):119–129.
10. R Kumar,AK Mishra, AK Singh, AK Singh, S Ram and **R Singh**, 2016. Depillaring of total thickness of a thick coal seam in single lift using cable bolts: a case study. *International Journal of Mining Science and Technology*, 26(2)**:** 223–233.
11. S. Ram, A. K. Singh, D. Kumar and **R. Singh**, "Design of Roof Bolt based Breaker Line Support in a Mechanised Depillaring Panel," In: Proceedings of 35th International Conference on Ground Control in Mining, 26-28 July 2016, Morgantown, WV, USA, pp. 155-61.
12. R. Kumar,A.K.Singh, A.K. Mishra, and **R. Singh**, 2015.Underground mining of thick coal seams. International Journal of Mining Science and Technology, 25 (6): 885–896.
13. **R. Singh,** S. Ram, Amit K. Singh, R. Kumar and Arun K. Singh. Strata control investigations during fully mechanized coal pillar extraction in Indian coalfields. In Proc. 33rd International Conference on Ground Control in Mining (ICGCM), Morgantown, USA, July 29-31, 2014: 158-164

14. P.Konicek, K.Soucek, L. Stas and **R. Singh**, 2013. Long-hole destress blasting for rock-burst control during deep underground coal mining.*International Journal of Rock Mechanics & Mining Sciences*, UK, 61(2013): 141–153.
15. **R. Singh**, Amit K. Singh and Sahendra Ram, 2012. Some practical rock mechanics considerations during underground pillar extraction from deep coal seams. Proc. 7th Asian Rock Mechanics Symposium, ARMS-2012, 15-19 October, Seoul: 10 pages.
16. **R. Singh,** A. K. Singh,J. Maiti, P. K. Mandal, Rashmi Singh and R. Kumar, 2011. An observational approach for assessment of dynamic loading during underground coal pillar extraction. *International Journal of Rock Mechanics and Mining Sciences*, UK, 48(5): 794-804.
17. A. K. Singh, **R. Singh**, J. Maiti, R. Kumar, and P. K. Mandal, 2011. Assessment of mining induced stress development over coal pillars during depillaring. *International Journal of Rock Mechanics and Mining Sciences,*UK, 48(5): 805-818.
18. **R. Singh,** P.K. Mandal, A.K. Singh, R. Kumarand A. Sinha. 2011.Coal pillar extraction at deep cover: with special reference to Indian coalfields.*International Journal of Coal Geology*, Netherland, **86**(2-3): 276-288.
19. **R. Singh**, 2009. Instrumentation and monitoring for strata behaviour investigation during underground coal mining in India. Proc. of the ISRM-Sponsored International Symposium on Rock Mechanics: SINOROCK2009, (Editors: J. A. Hudson, L. G. Tham, Xia-Ting Feng & A. K. L. Kwong.) University of Hong Kong, China: 868-872.
20. A. K. Singh and **R. Singh,** 2009. Indian Experiences of Mechanised Coal Pillar Extraction. Proc. of 28th International Conference on Ground Control in Mining, *July28-30,* Morgantown, West Virginia, U.S.A.
21. **R. Singh,**P. K. Mandal, A. K. Singh, R. Kumar and A. Sinha, 2008. Optimal underground extraction of coal at shallow cover beneath surface/subsurface objects: Indian practices. *International Journal of Rock Mechanics and Rock Engineering,*Italy,**41**(3): 421-444.
22. **R. Singh**, P. K. Mandal, A. K. Singh, R. Kumar, J. Maiti and A. K. Ghosh, 2008. Upshot of strata movement during underground mining of a thick coal seam below hilly terrain. *International Journal of Rock Mechanics and Mining Sciences,*UK, **45**(1): 29-46.
23. P. K. Mandal, **R. Singh**, J. Maiti, A. K. Singh, R. Kumar and Amalendu Sinha, 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,*UK, **45**(1): 11-28.
24. **R. Singh** and R. Kumar, 2007. Pillar stability during underground mining of the complete thickness of a thick coal seam in a single lift – Indian experiences. Proc. of the 1st Canada-US Rock Mechanics Symposium, (Editors: E. Eberhardt D. Stead & T. Morrison) Vancouver, Canada: 1463-68.
25. **R. Singh,** 2004. Staggered development of a thick coal seam for full height working in single lift by blasting gallery method. *International Journal of Rock Mechanics and Mining Sciences,* UK, **41**(5): 745-759.
26. **R. Singh,** S. Ram, A. K. Singh, S. Prasad and J.Buragohain 2004. Underground extraction of contiguous coal seams/sections consisting thin parting: a case study. Journal of South African Institute of Mining and Metallurgy (SAIMM), SA**,104**(1): 17-27.
27. **R. Singh**, P K Mandal and A K Singh 2003. Mining induced stress estimation for pillar extraction at shallow cover. *Proceedings of ISRM Congress 2003: Technology roadmap for rock mechanics,* South African Institute of Mining and Metallurgy, South Africa: 1087-1091.

28. **R. Singh**, 2003. Mechanised gallery drivage in coal seams with igneous intrusions. *Proceedings of ITA World Tunnelling Congress: (Re)Claiming the Underground Space, Saveur J. (ed.),* Amsterdam, Netherlands: 469-476.
29. **R. Singh**, A K Singh and P K Mandal, 2002. Cuttability of coal seams with igneous intrusion. *Engineering Geology, an international journal*. Netherland, 7(2002), 127-137.
30. A. K. Singh**, R**. **Singh**, M. Sarkar, P. K. Mandal, and D. Sharma, 2002. Inclined slicing of a thick coal seam in ascending order – A case study. *CIM Bulletin*, Canada, **95**(1059): 124-128.
31. **R. Singh,** P K Mandal, A K Singh and T. N. Singh, 2001. Cable bolting based mechanised depillaring of a thick coal seam. *International Journal of Rock Mechanics and Mining Sciences, UK,* **38***(2), 245-257.*
32. **R. Singh,** 2000. Underground extraction of thick coal seams of India. Proceedings of 12th International Conference on Coal Research (ICCR) inassociation with SAIMM, 12-15 Sept., 2000, Marshaltown, South Africa: 5-9.
33. **R. Singh,** 1999. Mining methods to overcome geo-technical problems during underground winning of thick coal seams – case studies. *Transactions of Institute of Mining and Metallurgy (IMM), UK, 108:A121-A131.*
34. **R. Singh** and T. N. Singh, 1999. Wide stall mining for optimal recovery of coal from a thick seam under surface features. *International Journal of Rock Mechanics and Mining Sciences, UK,* 36(2), 155-168.
35. **R. Singh** and T. N. Singh, 1999. Investigation into the behaviour of a support system and roof strata during sublevel caving of a thick coal seam. *Geotechnical and Geological Engineering an International Journal, UK, 17(1): 21-35.*
36. **R. Singh** and T. N. Singh, 1998. Oblique longwalling of a developed coal seam. *Proceedings of International Conference on Geomechanics/Ground Control in Mining and Underground Construction, Editors: N. Z. Aziz and B.Indraratna, University of Wollongong, Wollongong, Australia*: 377-386.
37. **R. Singh**, D. P. Chapman and K. B. Atkinson, 1997. Machine vision for dimensional measurements in mines. *Geotechnical and Geological Engineering an International Journal*, UK, 15(3): 185-203
38. **R. Singh**, D. P. Chapman and K. B. Atkinson, 1997. Digital photogrammetry for automatic close range measurement of textureless and featureless objects. *Photogrammetric record; an International Journal of Photogrammetry, UK,* 15(89): 691-702.
39. **R. Singh**, T. N. Singh and B. B. Dhar, 1996. Coal pillar loading for Shallow mining conditions. *International Journal of Rock Mechanics and Mining Sciences*, UK, 33(8): 757-768.
40. **R. Singh**, D. P. Chapman and K. B. Atkinson, 1996. Laser dot matrix based digital system for monitoring textureless roof strata of mines. *International Archives of Photogrammetry and Remote Sensing, Austria,* **35**(5): 540-545.
41. **R. Singh**, D. P. Chapman and K. B. Atkinson, 1995. CCD based active triangulation for rock surface measurement. *VideometricsIV, SPIE, Philadelphia, USA,* Vol. 2598: 233-244.
42. **R. Singh**, D. P. Chapman and K. B. Atkinson, 1995. Applications of photogrammetry in mining measurement. *Proceedings of UK Mineral Industry Conference on Mineral Extraction towards the Millennium, University of Leeds, UK*: 22 pages.
43. **R. Singh**, J. K. Singh, T. N. Singh and B. B. Dhar, 1995. Cuttability assessment of hard coal seams. *Geotechnical and Geological Engineering an International Journal UK,* 13(2): 63-78.

44. **R. Singh**, 1993. Photogrammetric monitoring of strata deformation. *Proceedings of7th International FIG Symposium on Deformation Measurements, Banff, Alberta, Canada*: 57-64.
45. T. N. Singh, **R. Singh**& J. K Singh, 1992. Investigation into cutting characteristic of Indian coal seams. *Proceedings of 11th International Congress on Ground Control in Mining, 7-10 July, 1992, Wollongong University N.S.W, Australia*: 652-659.
46. **R. Singh**, D. Prasad, M. A. Rafiqui & T. N. Singh, 1991. The Influence of geomining parameters over stress redistribution in and around depillaring faces. *Proceedings of 10th International Congress on Ground Control in Mining , June 10-12, 1991. West Virginia University, U.S.A.*: 281-286.
47. **R. Singh**, A. Kushwaha & T. N. Singh, 1991. Impact of overlying strata on chock shield performance: A case study. *Proceedings of 1st International Symposium on Mine Mechanisation and automation, Golden, Colorado, U.S.A*: 13-39.
48. **R. Singh**& T. N. Singh, 1990. Strata deformation and subsidence study by close-range photogrammetry. *Proceedings of ISPRS Symposium on Close Range Photogrammetry and Machine Vision, Zurich, Switzerland*: 1164-1170.
49. T. N. Singh & **R. Singh**, 1990. Investigation into stress and deformation around depillaring face - A case study. *Proceedings of MMIJ/IMM joint Symp. on Today's Technology for the Mining & Metallurgical Industries, Oct. 2-4, 1990, Kyoto, Japan*: 229-235.

Ph. D. Thesis

50. **R. Singh,** 1996. CCD based active triangulation for automatic close range monitoring of rock movement. *Ph. D. Thesis, UniversityCollegeLondon*: 217 pages.

International proceedings (Published in India)

51. Ashok Kumar, Arun K Singh, Sahendra Ram, Amit K Singh, Rakesh Kumar &**Rajendra Singh.** 2017.Estimation of roof lowering limit for an efficient and economical strata movement study in mechanised depillaring. Proc. Of 7th Asian Mining Congress. 08-11 November, 2017, MGMI, Kolkata, 11 pages.
52. V K Vohora and **R Singh**, 2017. Monitoring and measuring ground surface deformationusing Sentinel-1 satellite data. International Conference on NexGen Technologies for Mining and Fuel Industries (NxGnMiFu) Vigyan Bhawan, New Delhi, India. pp.509-514.
53. A. K. Singh, A. Kumar, **R. Singh** and S. Ram, 2017. Indigenous developments for the design of geo-technical elements of the continuous miner based mechanised depillaring. International Conference on NexGen Technologies for Mining and Fuel Industries (NxGnMiFu) Vigyan Bhawan, New Delhi, India. pp.117-128
54. P. Waclawik,L. Stas, P. Konicek and **R. Singh**, 2017. Failure assesment of a coal pillar during room and pillar mining. International Conference on NexGen Technologies for Mining and Fuel Industries (NxGnMiFu) Vigyan Bhawan, New Delhi, India. pp.514-520.
55. **R. Singh**, A. Kumar A,R. Kumar R, A. K. Singh and A. K. Singh. 2017 Underground mining of deep seated thick coal seams: an analysis from rock mechanics prospective.International Conference on NexGen Technologies for Mining and Fuel Industries (NxGnMiFu) Vigyan Bhawan, New Delhi, India. pp.433-440.
56. A. Kumar, A. K. Singh, S. Ram, A.K. Singh and **R. Singh**. 2016. Practical experiences of instrumentation and monitoring for depillaring. Proc. of International Conference on Recent Advances in Rock Engineering Bengaluru, India. pp. 578-583.

57. S. Ram, R. Kumar, A. Kumar, Dheeraj Kumar and **R. Singh**. 2016. Numerical modelling based rock load height estimation at the goaf edge in a mechanised depillaring panel. Proc. of International Conference on Recent Advances in Rock Engineering Bengaluru, India. pp. 330-334
58. A. Kumar, S. Ram and **R. Singh** 2015.Some practical rock mechanics considerations for rib/snook design in mechanised depillaring J of EG (Special Publication October 2015); ISSN: 0970-5317: 394-410.
59. Rajendra Singh, Arun Kr. Singh, Sahendra Ram, Amit Kr. Singh and Rakesh Kumar, 2014. Underground instrumentation based strata mechanics investigations for safe coal pillar extraction in Indian coalfields. Proc. Int. Symp ROCK INDIA 2014-Present Technology and Future Challenges and Workshop on Open Pit Mining, 20-22, August, CBIP- N. Delhi, 139-153.
60. A. K. Singh, P.K. Mandal, S. Ram, A. K. Singh, R. Kumar, and R. Singh, 2011. Influences of geo-mining conditions on strata control studies during underground pillar extraction: some Indian experiences. *Proc. of the International Conference on "Underground Space Technology"*, 17th - 19th January, 2011, Bangalore - India, pp. CM-01-1 - 19.
61. P. Konicek, K. Soucek,L. Stas,**R. Singh**& A. Sinha. 2010. Practices to control rock burst in deep coal mines of Upper Silesian coal basin and their applicability for Disergarh seam of Raniganj coalfield. Proc. of the ISRM International Symposium 2010& 6th Asian Rock Mechanics Symposium on "Advances in Rock Engineering", New Delhi, India.
62. P. K. Mandal, **R. Singh**, A. K. Singh and R. Kumar, 2010. Study of stability status and strengthening of weak and laminated parting for superimposed development of contiguous seams/sections. *Proc. of the ISRM International Symposium 2010 and 6th Asian Rock Mechanics Symposium on "Advances in Rock Engineering"*, 23 - 27 October, 2010, New Delhi, India, pp. 265-267.
63. **R. Singh,**A.K. Singh, P.K. Mandal and R. Kumar. 2010. Rock mechanics considerations for the success of mechanised coal pillar extraction in India. Proc. of the ISRM International Symposium 2010 & 6th Asian Rock Mechanics Symposium on "Advances in Rock Engineering", New Delhi, India.
64. **R. Singh**, A. K. Singh, P. K. Mandal and Rakesh Kumar 2008. Pillar stability during underground mining of complete thickness of a thick coal seam in single lift. *Proceedings of the second Asian Mining Congress, 16th January to 19th January, 2008, Organised by MGMI of India, Kolkata. 399-406.*
65. A Sinha, **R. Singh** and A. K. Singh, 2006. R&D effort to ease the challenges of underground coal mining. *Proceedings of the International Coal Congress and Expo on sustainable development of coal for energy security, 11th December to 13th December, 2006, New Delhi India. 369-376.*
66. **R. Singh**, A. K. Singh, P. K. Mandal, and R. Kumar, 2006. Measurement and analysis of mining induced stress for strata control during underground coal mining. *Proceedings of the first Asian Mining Congress, 16th January to 18th January, 2006, Organised by MGMI of India, Kolkata. 105-112.*
67. I. Satyanarayana, D. Deb, R. Singh, Antony Raja, 2005. Strata monitoring and analysis of blasting gallery panels – A case study. *Proceedings of International Symposium on Advances in Mining Technology and Management (Editors: A. Bhattacharjee, S.K. Das & UM Rao Karanam), IIT, Kharagpur, Nov. 30th to Dec. 2, 2005:* 203-217.
68. **R. Singh**, 2005.Some developments at CMRI to meet the global challenge of productivity and safety of underground coal mines *Proceedings of International*

Seminar on Coal Science and Technology – Emerging Global Dimensions, 12th to 13th April, New Delhi, India. 98-109.

69. **R. Singh**, P. K. Mandal, Arun K. Singh and A. Sinha, 2005. Application of roof bolt as systematic and breaker line supports for continuous miner based mechanized depillaring. *Proceedings of the first Indian Mineral Congress, 28th February to 1st March, 2005, ISM, Dhanbad. 295-308.*
70. **R. Singh,** P. K. Mandal, Arun K. Singh, Amit K Singh, Sahendra Ram and Nirmal Kumar, 2004. Mechanisation to meet the challenges of underground coal mining in India: a success story. *Proceedings of International conference on Future of Indian Mineral Industry: Challenges and Opportunities, 17th to 18th Sept., Organised by MGMI, India. 21-28.*
71. **R. Singh,** P. K. Mandal, and A. K. Singh, 2003. Technical innovation for intermediate mechanisation based underground mining of thick and contiguous coal seams of India. Proceedings of the 19th World Mining Congress , 1-5 November 2003, New Delhi,*(Editors: A K Ghose and L. K. Bose)*: 719-732.
72. **R. Singh,** M K Singh, P. K. Mandal, and A. K. Singh, 2002. Role of stress for optimal underground extraction of coal. *Proceedings of ISRM India Symposium on Advancing Rock Mechanics Frontiers to meet the Challenges of 21st Century*, 24 to 27 Sept., 2002, New Delhi, III 26-34.
73. P K Mandal, A K Singh, **R. Singh**, and J. Maiti,2002. Continuous monitoring of strata behaviour during depillaring operation in India. *Proceedings of International conference on Mineral Industry: Issues on Economics, Environment and Technology, 26th to 28 Sept., Organised by MGMI, India. 120-131.*
74. **R. Singh,** Arun K. Singh and P. K. Mandal, 2000. Policy driven technological developments for optimal underground extraction of coal *Proceedings of International Symposium on Mining Policy Initiatives (Editors: B. B. Dhar and N N. Gautam), New Delhi:* 204-213
75. **R. Singh,** P. K. Mandal**,** and A. K. Singh, 2000. "Technology Management for Optimal Underground Extraction of Coal from Thick Seams of India", *Proceedings of the International Conference on Technology Management for Mining Processing and Environment (TMMPE – 2000), 1-3 December, organised by Dept. of Mining Engineering, Indian Institute of Techology, Kharagpur:* 23-34
76. **R. Singh**, and B. K. Dubey, 1999. Thick seam mining and associated strata control problems of indian coal mines. *Proceedings of International Symposium on Clean Coal Initiatives (Editors: T.N. Singh and M. L. Gupta), New Delhi:* 191-202.
77. **R. Singh** and T. N. Singh, 1993. Influence of Mining dimension on overlying strata deformation. *Proceedings of the 4th Asian Mining, International Conference on Geology, Mining, Mineral Processing, Calcutta, India*: 349 - 360.
78. T. N. Singh, A. Kushwaha, **R. Singh**&Raghwendra Singh, 1992. Strata control observation around longwall-sublevel caving face of East Katras colliery. *Proceedings of International Symposium on Thick Seam Mining - Problems and Issues, Nov. 1992 C.M.R.S. Dhanbad*: 237-250.
79. **R. Singh**& T. N. Singh, 1988. Photogrammetric monitoring of mining environment. Proceedings of Indo-*British Workshop, Nov., 1988, Indian School of Mines, Dhanbad*: 91-98.

National Journals and Proceedings*:*

80. AK Singh, S Ram, **R Singh** and Ashok Kumar, 2016. Rib/snook competency in mechanised depillaring of the conventionally developed coal seams. *Journal of Mines Metals & Fuels, Sept.* 2016: 414-423.
81. Sahendra Ram, Dheeraj Kumar, P. Konicek, Amit Kr. Singh, Rakesh Kumar, Arun Kr. Singh and **Rajendra Singh**. 2015. Rock mechanics studies during continuous miner based coal pillar extraction in Indian coalfields.*Transactions, A technical publication of the MGMI, India, 111: 89-104.*
82. Rakesh Kumar, Arvind Kumar Mishra, Arun Kumar Singh, Amit Kumar Singh, Sahendra Ram and **Rajendra Singh**. 2015. Depillaring of total thickness of a thick coal seam in single lift using cable bolts: a case study. *Transactions, A technical publication of the MGMI, India, 111:66-88.*
83. □□□□□□□□ □□□□, □□□□ □□□□□ □□□□, □□□□ □□□□□, □□□□□ □□□□□ □□□ □□□□□□□□ □□□, 2015. □□□□□□ □□□□□ □□□□□□□ □□ □□□□□ □□□□□□□ □□□□□ □□ □□□□□□□□□ □□□□□□ □□ □□□ □□□□□□□ □□□□□□□□□ □□ :□□□□□□□□□□□□□□□□□ □□□□□□□□, □□□□ □□□ □□□□□ □□□□□□ □□□ □□□□□□ □□ □□□□□□□□□ □□□ □□□□□□ 11 □□ 2015 □□□□□□□□□□□□, □□□□□□□□-□□□□□□□□□□□, □□□□ □□□, □□□□□,□□□□□□□□□
84. SahendraRam, Arun Kr. Singh, Rakesh Kumar, Amit Kr. Singh, Dheeraj Kumar and **Rajendra Singh**.2014. Roof bolt based breaker-line design during underground coal pillar extraction. Presented in Workshop on design of goaf edge support system in Indian coal mines (SAGES): 25th April, 2014, ISM, Dhanbad.
85. A. K. Singh, R. Kumar, S.Ram, Amit K. Singh and **Rajendra Singh**, 2013. Rock mechanics considerations during continuous miner based coal pillar extraction in Indian coalfields. Proc. of National Workshop on Continuous Miner, 1-2 August DGMS, Dhanbad, 107-118.
86. □□□□□□□ □□□, □□□□ □□□□□ □□□□ □□□ □□□□□□□□ □□□□ (2012): □□□□ □□□-□□□□□□□ □□ □□□□□□ □□□□□□ □□□□□ □□ □□□□ □□ □□□□□ □□□□□□: □□□ □□ □□□ □□□□□, □□□□□ □□□□□: □□□□□□ 2025 □□□□□□□□□ □□□□□□□□, □□□□□ □□□□□□ □□□□ □□□□□□ □□□□□□□□□, 4-5 □□, 2012. □□□□□: □□ □□ □□ □□– □□□□□□□□ □□□□□□ □□□□□□□□□□□□□□□□□□□□(□□□□□□□□ □□□□□), □□0 □□ □□□□828108, □□□□□, □□□□□□□□
87. **R. Singh**& A. Sinha. 2010. Rock mechanics challenges and opportunities for deep underground coal mining. Proc. of National Seminar on " Meeting Rock Mechanics Challenge of deep underground Mining", 22-24 April, Dhanbad, 136-149.
88. A. K. Singh, **R.Singh**, P. K. Mandal, R. Kumar, A. K. Singh and S. Ram, 2009. Rock mechanics challenges of depillaring at deep cover. Journal of Mines, Metals & Fuels, **57**(9): pp.298-306.
89. S. K Jena, R.S. Singh, T. K. Mandal**, R. Singh,** A K Singh P. K. Mandal, A. K. Singh, Rakesh Kumar, S. Ram and A. K. Singh, 2008. Interaction of ground movement with underground mining of thick and contiguous sections below hilly terrain: a case study. *Minetech,***28**(2-3): pp.33-44.
90. Rakesh kumar,Arun Kumar Singh, P K Mandal and **R. Singh,** 2007. Stability of pillars during underground extraction of thick coal seam in single lift-case studies. *Minetech,***28**(1): pp.3-10.
91. P. K., Mandal, **R. Singh**, A. K. Singh, Rakesh Kumar and A. Sinha, 2006. State of art vis-à-vis Indian scenarion of application of continuous miner based mass production technology. *Journal of Mines Metals and Fuels,* 54(12): pp. 332-336.
92. A. Sinha, A. K. Ghosh and **R. Singh**, 2006. Underground mining of coal: Where are we and where are we heading?. *Proceedings of XVIII National Convention of Mining Engineers and National Seminar on Emerging Trends in the Mining Industry*, October 27-28, Hyderabad; 26-34.

93. P. K., Mandal, A. K. Singh, S. Ram, Rakesh Kumar and **R. Singh**, 2006. Instrumentation and monitoring strategies for study of ground movement during underground extraction of coal. *Mining and Engineering Journal,***8**(5): pp.15-27.
94. **R. Singh,** Rakesh kumar, P K Mandal, and Arun Kumar Singh, 2006. Mechanised depillaring using roof bolts as SSR and breakerline support: a success story. Proc. of the *National Seminar on Underground Coal Mining (Editors: M Jawed & P. K. Behra),* ISM, Dhanbad: 41-51.
95. A. K. Singh, P. K. Mandal, Rakesh Kumar and **R.Singh,** 2006. Stability assessment of an old underground working below a populated village: a case study. Proc. of the *National Seminar on Mine Subsidence Damages and Mine Subsidence Insurance Scheme (Editor: Dr. S. K. sarkar), Diesergarh, Asansole*: 50-55.
96. J. Maiti, P. K. Mandal, **R. Singh** and B. M. Kumar, 2006. Impact of stress redistribution on stability of workings during depillaring. *Journals of the Institutions of Engineers*, **87**: 10-22.
97. **R. Singh,** P K Mandal, A. K. Singh, R. Kumar, Sahendra Ram and S. K. Jena, 2005 Encountering induced horizontal stress during simultaneous depillaring of thick and contiguous sections below hilly terrain: a case study. *Transactions of MGMI, India,***102**(1&2): 37-61.
98. **R. Singh,** M. K. Singh, S. Ram and Amit K. Singh, 2005. Automation and automatic measurements for mining: CCD based approach. *Minetech,***26**(6): pp.37-45.
99. **R. Singh,** Rakesh Kumar, A K Singh and P K Mandal, 2005. Emerging technological scenarios and policies for efficient underground coal pillar extraction. Proceedings of POSTALE-2005, CMRI, Dhanbad: 169-178.
100. **R. Singh,** A K Singh P K Mandal, M K Singh and A. Sinha, 2004. Instrumentation and monitoring of strata movement during underground mining of coal. *Minetech,***25**(5): pp.12-26.
101. P. K., Mandal, A. K. Singh, S. Ram, Amit K. Singh, N. Kumar and **R. Singh**, 2004. Strata behaviour investigation of India's first depillaring face with continuous miner and shuttle car. *Minetech,***25**(6): pp.3-12.
102. **R. Singh,** P K Mandal and A K Singh 2004. Partial underground extraction of coal at shallow cover. The Indian Mining and Engineering Journal, **43** (2-3): pp. 29-44.
103. P. K. Mandal, A. K. Singh, S. Ram, Amit K. Singh and **R Singh**, 2004. Depillaring of a thick coal seam using cable bolts under shallow depth cover- A case study. The Indian Mining and Engineering Journal, 43 (7): pp. 11-18.
104. **R. Singh,** P K Mandal and A K Singh 2003. Geo-technical considerations for underground extraction of thick coal seams in India. Proceedings of Geo-mechanics and Ground Control, CMRI, Dhanbad: 205-218.
105. P. K. Mandal, A. K. Singh and **R. Singh,** 2003. Closure of a coal mine after underground extraction of thick seams: some geo-technical considerations. Proceedings of the National Seminar on Strategies for mine closure, CMRI, Dhanbad, October 11 - 12, 2003: 127-138.
106. **R. Singh,** B. P. Ahuja, K. Guruvaihaand M. Ramesh, 2003. Geo-technical considerations for full height extraction of a developed thick coal seam in one lift by blasting gallery method. *Transactions of MGMI, India,***100**(1+2): 102-116.
107. **R. Singh,** P. K. Mandal and A. K. Singh, 2002. Geo-technical considerations for long-term stability of developed coal seams below important surface features. Minetech, 23 (6), pp. 15-25.
108. **R. Singh**, A. K. Singh, P. K. Mandal, O. P. Singh & J. Buragohain, 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, Ranchi, Vol. 23, No. 1&2, pp. 3-11.

109. P. K. Mandal, A. K. Singh, O. P. Singh, J. Buragohain and **R. Singh,** 2002. A novel method of mining for underground winning of contiguous sections of a coal seam under fragile parting. *Journal of Mines, Metals and Fuels, 50(1&2),* pp 25-33.
110. A. K. Singh, P. K. Mandal, **R.Singh,** and S. Ram, 2002. Stability investigations during inclined slicing of thick coal seam by longwall method – A case study. Proceedings of the National Symposium on Sustainable Mining Technology : Present and Future, March 14-15, 2002, organised by AnnaUniversity, Chennai, , (Editors: K. Srinivas & K. V. Shanker), pp. 274-284.
111. P. K. Mandal, A. K. Singh and **R. Singh,** 2001. Underground mining technologies for optimal extraction of thick coal seams – case studies. Proceedings of the National Seminar on Problems and Prospects of Bord and Pillar mining in the New Millennium, November, 23 – 24, 2001, Organised by B. E. College (D.U.), Howrah, pp. 87 - 100.
112. **R. Singh,** P. K. Mandal, A. K. Singh, Rakesh Kumar, J. Buragohain, and O. P. Singh, 2001. Underground extraction of a critically thick coal seam standing on pillars and the development made along the roof horizon. Proceedings of national conference on strata control in coal mines, Rmamagundam, SCCL (AP), pp. 89-103.
113. **R. Singh,** 2001. Laser pattern based active triangulation: a method to achieve sub-pixel accuracy for automatic close range industrial measurements. Proceedings of national symposium on advances in remote sensing technology, SAC, Ahmedabad: IP16.
114. J. Buragohain, R. Kumar, O. P. Singh and **R. Singh**, 2001. Underground mining of thick and steep coal seams of NEC, The Indian Mining & Engineering Journal, Vol. 40, No. 4, pp.-31-40.
115. J. Buragohain, **R. Singh**, A. K. Singh and S. Ram, 2001. *In-situ* investigations to study interaction between two close seams/sections extracted with critical interburden thickness, Minetech, Vol. 22, No. 4, July-August, Ranchi, pp.13-23.
116. **R. Singh**, P. K. Mandal, and A. K. Singh, 2000. Cable Bolt Based Mechanised Depillaring of a Thick Coal Seam. Minetech, Vol. 21, No. 3 & 4, May-August, Ranchi, pp.3-9.
117. **R. Singh,**P. K.Mandal, and A. K. Singh, 2000.Wide Stall Mining: A Method to Optimise Coal Recovery from a Seam under surface features. Minetech, Vol. 21, No. 3 & 4, May-August, Ranchi, pp.10-17.
118. **R. Singh**and B. K. Dubey, *2000.* Cable bolting based mechanised depillaring of a thick coal seam. Proceedings of National Symposium on Rock mass reinforcement, BHU, Varanashi.
119. **R. Singh** and B K Dubey, 1998. Photogrammetric monitoring of surface and subsurface deformation during underground mining. *Proceedings of an special course on Subsidence Management, CMRI, Dhanbad:* 7 pages.
120. **R. Singh** and B K Dubey, 1998. Numerical modelling for parting stability during underpinning based depillaring of co*ntiguous sections of a coal seam. Proceedings of an special course on Roadway Support, CMRI, Dhanbad:* 11 pages.
121. **R. Singh**, D. P. Chapman and K. B. Atkinson, 1997. Digital photogrammetry based automatic measurement of sandstone roof of a mine. *Journal of Indian Society of Remote Sensing,* 25(1): 47-60.
122. **R. Singh,** 1996.Influence of goaf treatment over the behaviour of yielding foundations: an analysis based on case studies. *Proceedings of an special course on Stabilisation and Consolidation problems in Raniganj and Barakar Measure Coal seams, CMRI, Dhanbad: 15 pages*
123. **R. Singh**, A. Kushwaha, and T. N. Singh, 1993. Geotechnical evaluation of a mechanised Longwall - Soutirage face. *Minetech,* 14(5,6), 42-45.

124. T. N. Singh, S. Jayanth, A. Kushwaha, **R. Singh** andB. V. S. Parihar, 1993. Experimental trial of Chirimiri caving method of a thick coal seam. *Proceedings of Seminar on Improvement in Underground Coal Production, CMPDIL, Ranchi*, 8 pages.
125. T. N. Singh, D. Prasad, M. A. Rafiqui and **R. Singh**, 1993. Wide stall mining in Jharia coalfield - a case story. *Proceedings of the Workshop on Wide Stall Mining of Coal Seams under Constraints, CMRI, Dhanbad*: 12 pages.
126. **R. Singh**& T. N. Singh, 1989. Photogrammetry in geotechnical engineering. *Proceedings of ISRS National Symp. on Engineering Application of Remote Sensing & Recent Advance, Dec. 21-23, 1989, Indore*: 7 pages.
127. **R. Singh**& T. N. Singh, 1988. Motion parallax for strata deformation around mining excavation. *The Indian Mining & Engineering Journal*: 5-10.
128. **R. Singh**& T. N. Singh, 1987. Close range remote sensing for impact mining. *Proceedings of ISRS Symp. Dec., 1987., NRSA, Hyderabad*: 181-186.
129. **R. Singh**& T. N. Singh, 1987. Terrestrial photogrammetry for open pit monitoring. *Transaction of institution of Engineers, (Mining Div.)*, Vol. 67: 1-10.
130. **R. Singh**& T. N. Singh, 1986. Photogrammetry for mining studies. *Journal of Mines, Metals and Fuels, May-June*: 280-289.
131. **R. Singh**& T. N. Singh, 1986. Aero-space monitoring of natural resources. *National Symposium on Natural Resources Monitoring, December, 1986, ManipurUniversity, Imphal.*

Invited lectures/talk

132. **R. Singh,** 2001. Underground winning of thick coal seams: some recent developments at CMRI, Delivered at MGMI conference on 20th April, 2001, Yellendu Club, SCCL, Kothagudem.
133. **R. Singh,** 2005. Instrumentation and monitoring of strata movement during underground coal mining.Delivered at National Workshop on Rock Instrumentation: Practice and Possibilityes, on 17thMarch, 2005, Centre of Advance Study, Mining Engineering Dept., IT, BHU, Varanashi.
134. **R. Singh,**2007.Strata control during underground extraction of 3 seam in RG area by Blasting Gallery method. Delivered at Executive Trainee Centre, 18thJuly. 2007, Ramagundam, SCCL.
135. **R. Singh,** 2007. Underpinning based simultaneous extraction of contiguous coal seams.Delivered at National Workshop on Application of Numerical Modelling in Strata control for Coal mines, on 29 - 30thOctober, 2007, Dept. Of Mining Engineering, ISMU, Dhanbad.
136. **R. Singh,** 2007.Strata Monitoring in Thick Seam Mining. Delivered at Technology Exchange Programme on Rock Instrumentation on 27 - 29th Dec. 2007, Mining Engineering Dept., IT, BHU, Varanashi. `
137. **R. Singh,**2008.Future R&D needs for underground coal mining in India. Delivered at National Conference onEmerging Trends in Mining and Allied Industries, 2 – 3rdFeb. 2008, NIT, Rourkela.
138. **R. Singh**, 2009. Geo-mining Scenario of Indian Coalfields.Presented in7th Czech-Polish Conference (CZPK‘09)on *Geology of Coal Basin*,October 21 - 23, 2009 at the Institute of Geonics, Ostrava, The Czech Republic.
139. **R. Singh,** 2012.Rock mechanics considerations for the success of mechanised coal pillar extraction in India. Delivered at RG-1 area on 22-5-12, SCCL,Ramagundam.

140. **R. Singh,** 2013. Exploring mining method for a thick seam (10-15 m) at a depth of cover > 350 m. Delivered at SCCL HQ on 23rd March, 2013, SCCL, Kothagudem.
141. **R. Singh** and A. Sinha, 2013. Some important experiences of underground mining of thick coal seams in India. September 18, 2013 at the Institute of Geonics, Ostrava, The Czech Republic.
142. **R. Singh** and A. Sinha, 2013. Rock mechanics considerations during Continuous Miner based coal pillar extraction in Indian coalfields.September18, 2013 at the Institute of Geonics, Ostrava, The Czech Republic.