

Brief Bio-data

1. Name: Dr. Rajeev Ranjan Singh

2. Date of Birth: 12.01.1963

3. Current Position and Address (Include Email ID and Contact Number)

Chief Scientist

Rock Excavation Engineering Group
CSIR-CIMFR, Dhanbad-826015.

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4. Educational qualifications: (Graduation and above)

Sl. No.	Degree	Year of Passing	University/Institute	Subject
1	B. Sc.	1983	Ranchi University	Phy., Chem., Math
2	M. Sc.	1986	Gorakhpur University	Chemistry
3	M. Tech.	1997	ISM University	Mining Explosives
4	Ph.D.	2010	Vinoba Bhave University	Mining Explosives

5. Work experience:

Designation	Institute / company	From	To	Nature of Work
Scientist-B	CMRS	07.12.1989	06.12.1994	Testing, evaluation, investigations and R&D work related to mining explosives & accessories.
Scientist-C	CMRI	07.12.1994	06.12.1999	
Scientist-E ₁	CMRI	07.12.1999	06.12.2004	
Principal Scientist	CSIR-CIMFR	07.12.2004	06.12.2010	
Sr. Principal Scientist	CSIR-CIMFR	07.12.2010	06.12.2016	
Chief Scientist	CSIR-CIMFR	07.12.2016	Till date	

6. Work Area(s)/ Specialization:

Mining Explosives and Accessories.

7. Major contributions: (Max. 100 words):

a) **Spacer-aided-initiation (SAI) technique for improved pull and yield in solid blasting:**

This method has been patented and technology has been transferred to M/s IDL Explosives Ltd., Hyderabad. A unique slurry P₅ explosive (Pentadyne-HP) with very high AGS (15 cm) has been developed and approved by DGMS first time with this method of blasting. A pull of 2.1m with modified burn cut pattern and around 1.5m with existing wedge cut pattern of solid blasting has been achieved in GDK-5 incline mine of SCCL. Thus, this method with Pentadyne-HP explosive has potential to change the economics of around 300 u/g coal mines in India.

b) **Development of new emulsion explosive and cord system for blasting gallery (BG) method in underground coal mines:** Development of this system has helped in resumption and continuation of production of coal from BG method of mining thick seams underground mines in India and awarded with prestigious **CSIR Technology Award-2012**. It was patented and earned royalty of Rs. 36.23 lakhs for CIMFR.

c) **Establishment of National Set-ups and Standard Methodology for Testing & Evaluation of Explosives and Accessories:**

- Evaluation of deflagration characteristics of permitted explosives.

- Incendivity characteristics of 32mm dia. cartridges of permitted explosives.
- Incendivity characteristics of permitted detonators in coal dust atmosphere and
- Determination of post detonation toxic fumes of permitted explosives.

8. No. of Research Publications: 40

- Papers in Journals: 16
- In conference proceedings: 24
- Invited lectures delivered: Nil

• **List of best 05 publications**

- i) **Singh, R. R.**, Bhattacharyya, M.M., Singh, P.K. and Roy, S.K. (2000): Deflagration studies with NG-based P₅ explosives, ERZMETAL, Vol.53, Pages:734-740.
- ii) Roy, S.K., **Singh, R. R.**, Kumar, R., Amrit, A.K. and Rao, V.V.R. (2006): Explosive-cord system for blasting gallery method, The Indian Mining and Engineering Journal, Vol.45, Pages: 37-40.
- iii) Roy, S.K., **Singh, R. R.**, Kumar, R. and Dey, U.K. (2007): Evaluation of velocity of detonation of permitted explosives, International Journal of Blasting and Fragmentation, Vol.1, Pages: 69-79.
- iv) Roy, S.K., **Singh, R. R.** (2011): Use of spacer aided initiation technique in solid blasting in Indian underground coal mines, International Journal of Transactions of the Institutions of Mining & Metallurgy, Section A: Mining Technology, Vol. 120, Pages:25-35.
- v) **Singh, R. R. (2020)**: Quality and performance of permitted explosives and detonators used in SCCL mines in India, International Journal of Aspects in Mining & Mineral Sciences, Vol. 4, Issue 3, Pages: 495-503.

- Books/Chapters authored/edited: Nil

9. **List of 5 Major Contract R&D Projects:**

- i) S&T project on “Control of pollution due to toxic gases produced during blasting operations with explosives in underground coal mines” [GAP/V/13/COAL/MMB/85].
- ii) S&T project on “Optimisation of production from underground coal mines by achieving longer pull” [GAP/01/MS/MOC/2003-04].
- iii) Collaborative project on “R&D assistance for development of emulsion explosive and cord system for use in blasting gallery method” [MS/COLLAB/01/2005-06].
- iv) S&T project on “Establishment of standard method for assessment of incendivity characteristics of 32mm diameter permitted explosives” [GAP/002/MS/MOC/2005-06].
- v) Collaborative project on “Development and evaluation of emulsion permitted (P₁, P₃ and P₅) explosives suitable for use in Indian underground coal mines” [CLP/55/2014-15].

10. (a) **Name of Patents/Copyrights applied /granted/commercialized:**

Title of the Patent	Patent/Application No. (Filed/Granted) & Date	Licensee if commercialized
A method for solid blasting in underground coal mines for improving pull using air decking.	1538DEL2005 dated 10.06.2005	M/s IDL Explosives Ltd., Hyderabad.
New emulsion and cord system suitable for use in blasting gallery method in underground coal mines.	2468DEL2006 dated 10.05.2007	M/s IEL, Gomia.
A cap sensitive water-gel permitted explosive with high air gap sensitivity and a method of	E-2/3065/2015 dated 21.10.2015	M/s IDL Explosives Ltd., Hyderabad.

manufacture thereof.		
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(b) **Technologies/Products /knowhow/Services developed:**

- i) **Spacer-aided-initiation technique** has been developed to achieve higher pull in underground coal mines in India.
- ii) **Emulcoal-100** as a P₁, **Emulcoal-300** as a P₃ and **Emulcoal-500** as a P₅ emulsion explosives have been developed and are being used in Indian underground coal mines vis-à-vis generating royalty for CIMFR.
- iii) **Development of standard methodology/Set-up** for evaluation of Deflagration propensity, Post detonation toxic fumes of permitted explosives and incendivity characteristics of permitted detonators in coal dust atmosphere.

11. Honors/Awards/Recognitions/Fellowships/Scholarships/Professional Memberships received:

CSIR Technology Award for Physical Sciences including Engineering-2012 for developing non-nitroglycerine based Explosive-Cord system suitable for use in Blasting Gallery method in underground coal mines.

Professional Membership: Principal Member of BIS Sub Committee on Explosives and Pyrotechnics.

12. Societal Contributions: Nil

(Dr. Rajeev Ranjan Singh)
Chief Scientist