

7th Asian Mining Congress & Exhibition

November 8-11th 2017 • Kolkata, India

Supported by :



सत्यमेव जयते

Govt. of India

- ▶ Ministry of Coal
- ▶ Ministry of Steel



HIGHLIGHTS & RECOMMENDATIONS



Organised by



**The Mining, Geological &
Metallurgical Institute of
India (MGMI)**

SNAPSHOTS OF 7th AMC & IME 2017



The Mining Geological and Metallurgical Institute of India (MGMI), which marked a century of its existence in 2006, is the oldest professional institute of its kind in Asia. Since its inception the MGMI has been **Promoting the cause of Mineral Industry** through multidisciplinary interactions among the scientists, technologists, engineers, industrialists, academicians and the policy makers in the government and private agencies. MGMI fulfils its objective of encouraging, assisting and extending knowledge and information connected with the earth sciences and associated disciplines through organising Lectures, Seminars, Publications, Training programmes and Technical services to the industry. The Institute, headquartered in Kolkata, presently has more than 2800 members in its 18 branches all over the country. In addition, there are also members from abroad. MGMI regularly organises National and International Conferences and brings out publications on topical subjects for the advancement of the mineral industry.



Background and Objective

The **Asian Mining Congress** is a prestigious biennial event of MGMI that commenced in 2006 to commemorate the centenary of the Institute. Recent trend indicates that economic growth of Asian countries will gain momentum in the near future. To enable such growth the mineral industry is also required to gear up and accelerate its own pace of development. This is of utmost importance in the backdrop of increased demand of raw materials, including those for the 'sunrise' sector, to boost the economy in this region. The Congress provides a forum for the miners, planners, policy makers, regulators, scientists, academicians and equipment manufacturers to discuss the various issues affecting the mining industry in the Asian region in particular, and the rest of the world in general. The Congress, along with the International Mining Exhibition, held concurrently at Kolkata provides an unrivalled opportunity for the manufacturers of mining machinery in the world to showcase their products and do business.

Theme

In view of the above background it was especially appropriate and timely to organize the 7th Asian Mining Congress on a topical subject as its theme:

International Cooperation in Innovative
Technology for Growth of Mineral Industry

Highlights

The **7th Asian Mining Congress (AMC)** was held at the hotel The Westin, Kolkata, Rajarhat, India, during **8th to 10th November, 2017**. Simultaneously with the Congress, the 7th International Mining Exhibition (IME 2017) was also organized in collaboration with Tafcon Projects (India) Pvt Ltd at nearby Eco Park, Rajarhat, Kolkata, during 8th to 11th November, 2017. The Congress was attended by more than **400 delegates, guests and participants** from India including some from abroad, from eleven countries like **Australia, China, Czech Republic, Iran, Italy, Japan, Malaysia, Poland, Russia, United Arab Emirates, United Kingdom, United States of America, Austria**. A total of **58 papers** on varied topics covering mining and processing of minerals were presented and discussed in **two Plenary, one Keynote and seven Technical sessions**. There were **four presentations** from companies on their products, activities and proficiencies. The soft copies of the papers and presentations were collated in **pen drive and provided to the delegates** along with the Souvenir and volume of Congress Proceedings.



INAUGURAL SESSION

On the morning of **8th November 2017** the opening of the **7th Asian Mining Congress** was marked by an invocation song from the late poet laureate Rabindranath Tagore, which was followed by the ceremonial lighting of lamps by the Chief Guest and Guests of Honour.

The Congress was inaugurated by **Mr. Susheel Kumar**, IAS, Secretary, Ministry of Coal, Govt. of India and **Chief Guest** of the event. The Guests of Honour at the occasion were:

- **HE Mr. Milan Hovorka**, Ambassador, Embassy of Czech Republic, Special Guest
- **Mr. Gopal Singh**, Chairman, Coal India Ltd (CIL)
- **Mr. AK Jha**, Chairman, Organizing Committee, 7th AMC & CMD, Mahanadi Coalfields Limited (MCL)

The session was chaired by **Dr. NK Nanda**, President, MGMI & Director (Tech), National Mineral Development Corporation (NMDC).

In his welcome address, Dr. N K Nanda gave an overview of MGMI, the vast reservoir of talent, experience and multiple expertise the Institute possesses and its activities, highlighting the special relevance of the Asian Mining Congress in the present day global scenario. Dr. Nanda extended a warm welcome to the delegates and participants and expressed special thanks to Mr. Susheel Kumar, the Chief Guest.

Mr. AK Jha, Chairman, 7th AMC Organizing Committee, gave a brief account of the Congress and introduced the theme of the Congress pointing out that Asia is the largest continent with all minerals and there is huge scope of mining and other mineral related activities.

Mr. Gopal Singh in his address mentioned about MGMI, a premier institute of the continent, its history spanning 111 years from the days of pit mining to the modern day of surface miners. He spoke about Coal India Limited that enjoyed monopoly earlier, but now being threatened with imports of coal and the roles of other sources of energy. He appreciated the transformation in Indian mining sector, which he considered is necessary. He compared India's coal and energy scenario with that of China whose coal resource is 1.5 times, but production is 5 times and per capita electricity consumption is 3 times. He emphasized that mineral production must increase and MGMI should play a significant role in this. He hoped that many actionable points would emerge in the course of the Congress and these should be presented at the Valedictory session. He concluded with thanks to the organizers.

His Excellency Mr. Milan Hovorka expressed gratitude to MGMI for the invitation to address the august gathering. He said that 3-4 decades back mining was destroying the environment. 21st century mining is no longer like that because of advancement in technologies. There has been an overall change in approach. Mining companies have become environment conscious. The social and political issues are now interlinked. He told mining of minerals is a necessity. The major issue is to extract without harming environment. He pointed out that seminars enhance knowledge, quality of high level professionalism, create partnerships between



Lighting of Lamp by Dignitaries



Inaugural Session



Welcome Address by Dr NK Nanda



Mr AK Jha addressing



Address by Mr Gopal Singh

countries. He talked of the close relationship between Czech Republic and India.

In the inaugural address, Mr. Susheel Kumar expressed pleasure to be at the 7th Asian Mining Congress. He said mining is a very old profession and industry. According to him, the two priorities of mining sector are to ensure preservation of the environment and safety of operations. While other concerns are generally taken care of, these two are not given due importance by miners. Public pressure on environment preservation is now-a-days enormous and the future is all the more challenging. Global community is now conscious and ever watchful, and the concerns of environmentalists need to be addressed seriously. In his opinion, however, things have improved, but not as much as it should have been. He suggested that institutes may take initiatives to produce good environmental managers / miners.

Mr. Kumar further informed that Government of India has created Comprehensive Environmental Pollution Index (CEPI) to measure pollution at mining and industrial areas. Mining is a great contributor to pollution. With some measures taken, the situation has improved marginally, but not to a satisfactory level. He suggested that MGMI might organize seminars focused on environment and safety and make recommendations to the Government for drawing up a suitable action plan.

He pointed out that safety record in Indian industries is not very good, compared to Australia. Why cannot India become a global leader in safe mining? According to him, the problem is in attitude, lack of training and skill, especially at lower level. He suggested no unskilled labour to be employed for skilled jobs. There should be regular training. His advice to Coal India authorities was to plan to achieve the position of global topper in safety by 2020 / 2022. His message was to 'Resolve with a new enthusiasm to work for sound environmental management and utmost safety'.

The **Souvenir and Proceedings volume** of **7th Asian Mining Congress** were released by the dignitaries on the dais. A book '**Application of Technology on Sustainable Mining**' written by **Dr. NK Nanda** was also released. The guests were then presented with mementoes.

The inaugural session concluded with a **Vote of Thanks** by **Mr. Prasanta Roy** who assured that deliberations on environment and safety will be arranged by MGMI.



Address by HE Mr Milan Hovorka



Inaugural Address by Mr Susheel Kumar



Mr Susheel Kumar addressing



Mr Susheel Kumar being felicitated by Dr N K Nanda



Release of Congress Proceedings Volume



Vote of Thanks by Prasanta Roy



The session was chaired by **Prof. SP Banerjee**, Past President MGMI & Former Director-in-Charge, IIT (ISM), Dhanbad and **Mr. SK Choudhury**, Former Controller General, Indian Bureau of Mines (IBM). **Mr. B.C. Bhattacharya**, Former Chief General Manager, CIL, coordinated the proceedings of the session.



Mr. N Kutumba Rao, Director General, Geological Survey of India (GSI), in course of his deliberation on **'GSI – In National Development through Exploration'** mentioned that Geological Survey of India, the harbinger of industrialization in India, was established in 1851 and is the second oldest geological survey in the world. He highlighted the achievements and ventures of GSI, the premier organization in the forefront of geoscientific activities in the country. Various activities for baseline data generation and assessment of natural resources were presented.



Mr. Ranjan Sahai, Controller General, IBM, spoke on **'Amended MMDR. Act, MCDR, MCR and Latest Status of Auctioning of Mineral Sites'**. According to him, Indian mining Sector is in a process of evolution to become world class. While discussing the recent reforms in the Act and sub-legislations, evolution of mineral legislation were reviewed. Latest status of auctioning of mines, status of e-auctioning of mining blocks, measures being taken to accelerate the process of auctioning and present status were discussed by him.



Mr. PK Sarkar, Director General, Directorate General of Mines Safety (DGMS), in his presentation **'Importance of Strategic Goal to Achieve Better Safety'**, gave an overview of mining disasters in India. According to him there has hardly been any improvement in coal sector, where the recent trend in disasters shows slope and dump failure. In non-coal sector bench failure is the main cause. The stone mines of Rajasthan, Jharkhand are of serious concern. He broadly discussed the Mines Act and Regulatory framework, present system to implement the provisions of the Act. Challenges and strategies to address mining disasters and importance of strategic plan/goal to address the concerns were suggested.



Mr. Binay Dayal, Director (Tech), Coal India Limited (CIL), spoke on **'Need of Innovation in Mineral Industry'**. He mentioned that India has made significant efforts in driving innovation and technological improvement in mineral sector, but there is still a long way to go. According to him international cooperation may shorten the process as there will be benefit from exchange of international knowledge. He suggested some areas of innovation to play key roles, like digital technology, robotics in mining to be developed through S&T, futuristic applications in coal mining, etc.



Dr. PK Singh, Director, Central Institute of Mining and Fuel Research (CIMFR), spoke on **'Controlled Blasting Practices in India – An Overview'**. Drilling and blasting are the most efficient method of excavation, but are associated with some adverse outcomes as ground vibrations, air-overpressure, fly-rocks, back-break, instability of the final wall of the benches, etc. Controlled blasting techniques represent one of the most important methods to counter these unwanted accompanying effects. Different controlled blasting methods successfully practised in India were summarized. A few techniques applied at some mines were also discussed. According to him the implementation and practice of controlled blasting methods not just reduces the unwanted effects of blasting but also significantly improves production of the valuable mineral resources with greater efficiency and safety.

Queries from the audience were answered by the speakers. The proceedings of the session were summarized by Prof. SP Banerjee. Mr. SK Choudhury thanked the speakers.



The Chairpersons of the session were **Mr. Partha S Bhattacharyya**, Former Chairman, CIL and **Mr. AN Sahay**, Past President, MGMI & Former CMD, MCL, and **Mr. Anup Biswas**, Former Dy. Director General, DGMS, was the coordinator.



In introductory remarks **Mr. Partha S Bhattacharyya** mentioned that the coal sector was facing a serious situation and its continued growth for thermal power generation appeared doubtful after a few years. He suggested looking into alternate uses of coal. He advised CIMFR to find suitable technology to recover locked up coal in pillars and abandoned mines.

Mr. BR Viswanatha, CGM, Bharat Earth Movers Limited (BEML), talked on the products, activities and capabilities of Bharat Earth Movers Limited. With the help of powerpoint presentation he displayed the new machines developed by BEML.



Mr. Atul Bhatt, CMD, MECON, talked about '*Raw Material Security in Steel Sector: Challenges Ahead*'. Production of iron ore is on the increase and is to go further up to meet the country's demand. He stressed the need to develop Special Mining Zones (SMZ) and larger sized blocks in iron ore rich freehold areas. According to him import of coking coal may be reduced and technology to use non-coking coal in place of coking coal should be developed. He then described services offered by MECON and support for solutions in meeting major challenges in the mining sector.

Mr. K Biswal, Director (Finance), NTPC, presented the power scenario in India. NTPC has taken up coal production and is now also a coal-mining company likely to produce 50 mt annually within 5 years. It is a pioneer in digital application with efficient and eco-friendly mining design and operations. NTPC is planning fuel mix linked end-use power projects of captive blocks by 2032. Mr. Biswal discussed some crucial environmental issues in coal mining sector.



Mr. B Bhaskar Rao, Director (Planning & Projects), Singareni Coal Company Limited (SCCL), mentioned SCCL was the oldest state-owned coal company in India. It is also the first coal company to venture into power sector. It is now mining coal with a stripping ratio of 1:7, and plans to do so up to stripping ratio of 1:12. He claimed that SCCL is the leader in application of Information Technology in mining sector.

Mr. Peeyush Kumar, Director (Tech), Ministry of Coal, Government of India, spoke on '*Innovative Technologies for the Growth of Coal Sector*'. He talked of challenges in energy supply. Nearly 30% of Indian population do not have access to electricity and use biomass as fuel. He presented demand – supply scenario, inventory and highlights of coal sector. In order to meet the domestic requirement, the country is planning to double the coal production in next 3-4 years and a number of initiatives have been taken up on policy front for adoption of newer technologies to ensure sustainable development of the sector. He talked of innovative technologies, like Vari jig in washing of coal, extraction of cleaner energy from coal like Coal Bed Methane (CBM) / Coal Mine Methane (CMM), development of Underground coal gasification (UCG) from inaccessible coal deposits, surface miners for blasting-free mining of coal, using tube conveyors for transportation, use of Unmanned Aerial Vehicles (UAV) / Drones for various measurement and surveying operations, Carbon Capture, Utilization and Storage (CCUS) methods and technologies.



Mr. PS Bhattacharya summed up the deliberations and lauded BEML, NTPC for use of innovative technologies. After a short question – answer spell the session concluded with Mr. AN Sahay offering thanks to the speakers.



The Keynote session was chaired by **Prof. BB Dhar**, Past President, MGMI & Former Director, Central Mining Research Institute (CMRI) and **Mr. NC Jha**, Past President, MGMI & Former Chairman, CIL, with **Dr. Kalyan Sen**, Former Director, CMRI as coordinator.

Dr. Abbas Parwresh, Professor, Mineral Economist, Technical Advisor and Consultant for Mines & Mining Industries, Iran, gave a discourse on *'The Future of Mining - Propelling to Underground'* and said the global mining industry is currently facing heaps of knotty problems, mostly in terms of environmental considerations and social responsibilities. Environmental impacts are serious today and there are big challenges requiring significant resources to reduce or mitigate the environmental problems caused by mining. There are sufficient and promising occurrences of minerals deeper down – some lying in proximity of the operating mines, some small but high grade, deep seated deposits and also those in the deep seas. Although going deeper can cause serious economic concern, there are some advantages because of less production of waste and has less damage compared to surface mining, which leave large environmental footprint. To remove these formidable problems the mining industry has to look for using appropriate technology and needs to be more innovative and above all consider underground mining as the way out in order to survive.



Prof. SP Banerjee, Former President, MGMI & Former Director-in-Charge, IIT (ISM), spoke on *'Green Mining, Climate Change and Mitigating Measures'*. He discussed the Paris Agreement on climate change and the impact of US withdrawal from the Agreement. Statistics of total and per capita Green House Gas (GHG) emissions of different countries were presented. India's commitments relating to GHG emissions and Energy saving measures as key to GHG reduction from the Indian mining sector were discussed. Main components of Green or Eco-friendly mining as practised in the Indian mining industry were addressed. According to him the mining industry is also taking various other eco-friendly initiatives through adoption of improved and innovative land reclamation and afforestation practices, air and water quality management, increased use of surface miners and implementing the 'Star rating Scheme' of the Government to progress towards more eco-friendly and sustainable mining. The mining industry in India is aware that mining is only an interim use of the land and a lot of stress is put now-a-days in preparing good quality progressive and final mine closure plans and implementing them in letter and spirit.



Mr. Tim Martin, Trade Commissioner, Australia, expressing his happiness to be present at the Congress, spoke on *'Australia – India Resource Relationship'* highlighting the need for interactions, cooperation in mining technology and services. He said there are government-to-government linkages, investment prospects, different bilateral mechanisms and agreements. There may be high level inter-ministerial dialogues. He talked about Indo-Australian collaborative initiative at Indian Institute of Technology (Indian School of Mines) [IIT – ISM], and also mentioned about some minerals like, coal, iron ore that Australia supplies to India.



Mr. U Kumar, Past President, MGMI & Former CMD, South Eastern Coalfields Limited (SECL), deliberated on *'Investment opportunities in Mineral Sector'*. According to him the most important mineral resource in India is coal, which is and will continue to play an important role in India's energy scenario, but there are challenges before the Indian coal industry that have to be faced. Apart from meeting the ever growing demand and making quality coal available, the industry will also have to establish additional extractable reserves, take care of the adverse environmental impact of coal mining and develop alternative usage. He discussed about these challenges and the manner in which these can be met and would create huge investment opportunities. Private Sector will have to play a predominant role. These investment opportunities, if successfully utilized, would enable the country to achieve the cherished ambition of becoming a developed nation.



Dr. Uday Kumar, Professor & Head, Division of Operation and Maintenance Engineering, Luleå University of Technology, Sweden, made a presentation on *'Transformative Maintenance Technologies and Solutions for the Modern Mining Systems'*. It was centered on the capability of enabling technologies – new and emerging that will facilitate development of transformative technologies for the maintenance of a modern-day mining system using the power of predictive and prescriptive analytics. The presentation was an overview of matured, new and emerging technologies useful for effective life cycle management of capital intensive mining equipment with focus on new maintenance technologies incorporating big data analytics, industrial internet, artificial intelligence, etc. It covered both technological aspects and management issues based on an ongoing R&D project with aim to implement eMaintenance solutions in a Swedish mine.



Mr. DV Pichamuthu, National Council Member, Institution of Engineers, spoke on *'India's Mineral Policy, Legislation and the Industry'*. He traced the journey of evolution of the Policy and the legislation and what it portends for the Mineral Industry. The formulation of India's Mineral Policy started with the Mineral Policy Conference held in 1947. This led to two landmark developments. First, the enactment of the Mines & Minerals (Regulations & Development) Act, MMRD Act for short, and secondly, the establishment of the Indian Bureau of Mines, both in 1948. This Act was superseded by the MMDR Act, 1957 which continues till date but with major amendments, the latest being in 2016. A National Mineral Policy (NMP) was first spelt out in 1993 and a New Mineral Policy was unveiled in 2008. The amendments to the MMRD Act were supposed to be in tune with the Policy and were in fact so till the recent amendment in 2016. According to him the recently amended Act seems to be completely at variance with the spirit of the National Mineral Policy (NMP), 2008. Mr. SK Choudhury pointed out that NMP-2008 is being revised by the end of this year (2017).



Prof. BB Dhar summarized the proceedings and Mr. NC Jha wound up the session by thanking the speakers.



TECHNICAL SESSIONS

There were altogether 7 Technical Sessions, besides the ones mentioned earlier, on various topics. In all 45 papers were selected for presentation in the 7 sessions, out of which 42 were presented by scientists, technologists and academicians from India and abroad. The sessions with lead topics, chairpersons, coordinators and the papers presented by authors / speakers are listed below. Names of speakers who presented the paper are marked bold.

Technical Session I

Policy Matters, Legislations, Investment Opportunities, Environment and Green Mining



Chairperson : **Mr. DV Pichamuthu**, National Council Member, Institution of Engineers

Coordinator : **Mr. SK Ghose**, Former Manager (Metallurgy), HCL

- **Prof. Jayanta Bhattacharya** – *Global Financing Methods of Mining Projects and Evolution of Alternative Finance*
- **Dr. Suvendu Bose** – *Investment in Indian Mining Industry - A Bright Future Ahead*
- **Dr. Shambhu Jha** – *Strategies for Green Mining at MCL*
- **Debashish Mishra** and Dr. Nageswar Sahay – *Mitigation of Problem of Spontaneous Heating During Liquidation of Thick Coal Seam*
- **Alok Kumar Singh** – *Kayakalp Model of Governance: A Silver Bullet for Coal Mining Industry*
- Ms Priti Saha and **Dr. Biswajit Paul** – *Geospatial Assessment of Mining Activities and Environmental Planning in a Populated Coal block of Jharia Coalfields, India*

Technical Session II

Mining Technology — Opencast



Chairpersons : **Mr. RK Saha**, Past President, MGMI & CMD, Central Coalfields Limited (CCL)

Mr. B Bhaskar Rao, Director (Planning & Projects), SCCL

Coordinator : **Mr. A Acharya**, Former Coal Controller

- **Prof. GK Pradhan** – *An Investigation Into the Use of Surface Miner for Hard Rock Surface Mining*
- **Prof. Indrajit Roy**, Mr. Abhishek Roy and Dr. Som Dutta – *Influence of Geo-Engineering Parameters on Stability of External Dumps of Western Coalfields Limited*
- **Dr. Abhiram Kumar Verma**, Prof. Debasis Deb and Prof. KUM Rao – *Dump Stability Analysis of a Coal Mine Dump with Foundation of Black Cotton Soil*
- **Mr. Pushendra Sharma**, Mr. Sahil Sardana, Mr. Manish Kumar Jha, Mr. A. K. Verma – *Stability of Rock Slopes Under Varying Thermo-Mechanical Condition in Fire Prone Area*
- **Dr. John Loui Porathur** and Dr. Pijush Pal Roy – *Highwall Mining – Current Scenario in India*
- **Mr. Keith Vining**, Research Group Leader, CSIRO Mineral Resources, Australia – *A Geometallurgical Approach to Iron Ore Processing*

Technical Session III

Mining Technology – Underground



Chairpersons : **Mr. AK Singh**, CMD, Bharat Coking Coal Limited (BCCL)
Mr. S Shankar, Director (E&M), SCCL

Coordinator : **Mr. Vijaypal Reddy**, General Manager, Ramagundam-I Area, SCCL

- Dr. Rajendra Singh, Arun K Singh, **Ashok Kumar**, Sahendra Ram, Rakesh Kumar and Amit K Singh – *Estimation of Roof Lowering Limit for an Efficient and Economical Strata Movement Study in Mechanised Depillaring*
- **Gopal Prasad**, Avijit Mallick, Ajay Kumar Sharma and Subrata Kundu – *Successful Implementation of Mass Production Technology at Jhanjra Project of Eastern Coalfields Limited - A Perspective*
- **Sidharth Talan** and Prof. Ashis Bhattacharjee – *Assessment of Relationship of Some Causal Factors Associated with Productivity of Longwall Mining: A Case Study in Australia*
- **AJ Das**, P K Mandal, A Kushwaha, S Tewari, Prof. P S Paul and Prof. R K Sinha – *Effect of the Strata Inclination during Underground Extraction of the Inclined Coal Seams*
- **Niraj Kumar** – *Mechanized Roof Bolting in Longwall Roadways Development – An Indian Geomining Perspective*
- **Dr. Satyendra K Singh** – *Stability Analysis of Underground Workings below the Proposed East-West Rail Corridor: Localised as well as Trough Subsidence Assessment*

TECHNICAL SESSIONS

Technical Session IV

Blasting Technology and Tunneling



Chairpersons : **Dr. PK Singh**, Director, CIMFR
Prof. GK Pradhan, Dean, AKS University

Coordinator : **Mr. BC Bhattacharya**, Former Chief General Manager, CIL

- **Dr. Pijush Pal Roy**, Dr. Chhangte Sawmliana, Rakesh Kumar Singh, Rama Shankar Yadav, Narayan Kr. Bhagat, Panchanan Hembram, Sudhamoy Ghanti and Anshuman Mazumder – *Demolition of Over-Bridges on Active Railroad Tracks in Populated Areas*
- **Mohd. Shahid** and Mr. Binay Kumar Singh – *Influence of Specific Energy Consumption & Productive Yield of Explosives on Percentage of Boulders at Different Blasting Practices: A Numerical Approach - A Case Study*
- **Sujit Kumar**, Praveen Ranjan, Dr. AK Mishra, Imran Ahmad, Alok Rai, Prasun Singha, Gulshan Kumar Sadwani – *Implementation of Flexigel. Bulk System - A Case Study of West Bokaro Colliery, Tata Steel Limited*
- Dr. Anindya Sinha, **Ashish Das**, Pritiranjana Singh, Dayamoy Garai – *Application of Precise Initiation System and Artificial Neural Network in Open Pit Coal Mine for Controlled Blasting Method*
- **Vivek K Himanshu**, MP Roy, Prof. AK Mishra and Mr. PK Singh – *Prediction of Blast Induced Vibration-Statistical and Simulation Approach*
- **Dr. RD Dwivedi** and Dr. RK Goel – *Challenges Faced in Construction of Chenani-Nashri Tunnels*
- **Dr. MP Roy** – *Geological Discontinuities, Blast Vibration and Fragmentation Control - A Case Study*

Technical Session V

Rock Mechanics and Oil & Gas

Chairpersons : **Mr. Smarajit Chakrabarti**, Former CMD, Eastern Coalfields Limited (ECL)
Dr. GP Karmakar, Professor, IIT, Kharagpur

Coordinator : **Mr. Ranjit Datta**, Former Director, GSI

- **Aditya Pandey**, Kattamuri Pavan Kumar and Dr. BS Sastry – *Determination of Thermal Conductivity of Rocks Using Lee's Method*



- **Dr. Vinod Atmaram Mendhe**, Dr. Pradeep Kumar Singh, Dr. Amalendu Sinha, Ms Subhashree Mishra, Ms Mollika Bannerjee – *Geological and Geochemical Characterization of Lower Gondwana Shale Beds of Damodar Valley for Hydrocarbon Potential and Development*
- **Dr. Basanta Kumar Prusty** – *Characterisation of Damodar Valley Shales of Shale Gas Exploration*
- **KK Chandan** and Dr. GP Karmakar – *Flocculation Studies of Oilfield Drilling Mud using Polymers*
- **Dr. Richard Blewett**, Geoscience Australia – *Australian Mining and Exploration - A National Perspective of Australia*

Technical Session VI

Mineral Processing and Information Technology



Chairperson : **Mr. AK Mishra**, Director (Tech), CCL

Coordinator : **Dr. JP Barnwal**, Former Chief Scientist, AMPRI

- **Arijit Deb** – *Mineral Processing and Beneficiation Plants - Problems Faced during Material Handling with Solutions*
- **Gurudas Mustafi** and Arpit Gupta – *Deshaling Run of Mine Coal through Romjig or BatacJig*
- **Amit Kumar Gorai** – *Adaptive Neuro-Fuzzy Inference System (ANFIS) for Classification of Iron Ore using Vision Based System*
- SK Chaurasiya and Dr. R Markandeya (paper read by **Mr. Rajan**) – *Utilization of Beneficiated Slimes and Fines for Pelletization*
- **B Kumar** – *E-Capital Fund Management Including Re-Appropriation*
- **TVS Subrahmanyam**, Somiran Mondal and Rajan Kumar – *Influence of Coal Size Distribution and Liner Surface Roughness on Wall Angle of Friction*
- Rajan Kumar, Vibhuti Roshan and **Anand Chandra** – *Utilization of Ultra Fines Size (-150 micron) of Iron Ore Fines in Sinter Making*

TECHNICAL SESSIONS

Technical Session VII

Health & Safety and Human Resource



Chairpersons : **Dr. Anindya Sinha**, Ministry of Coal, Government of India
Mr. S Chandrashekar, Director (Operations), SCCL

Coordinator : **Mr. AK Nath**, TS to Director (Tech), CIL

- **Rahul Upadhyay** – *Assessment of Whole-Body Vibration Exposure of Heavy Earth Moving Machine Operators in Chromite Mines: A Case Study*
- **Amrites Senapati** and Prof. Ashis Bhattacharjee – *Impact of Some Occupational Hazards and Individual Characteristics in Workers - Injuries at Continuous Miner Worksite*
- **Prof. RM Bhattacharjee** and AK Dash – *Review of Indian Inundation Disasters using Root Cause Analysis Techniques*
- **KP Khaitan** – *Shovel and Truck - Side-By-Side – Coordinated Training*
- **Dr. Tillman Rasche**, SIMTAR – *Risk Management and Risk Based Legislation - Foundations for Safe and Productive Mining*



The **7th Asian Mining Congress** concluded with the Valedictory Session in the afternoon of 10th November 2017. The **Chief Guest** was **Mr. Suresh Kumar**, IAS, Additional Secretary, Ministry of Coal, Govt of India and **Dr. Abbas Parwaaresh**, Professor, Mineral Economist, Technical Advisor and Consultant for Mines & Mining Industries, Iran, was the Guest of Honour. Others on the dais were **Dr. NK Nanda**, President, MGMI, **Mr. LK Bose**, Chairman, Technical Committee, 7th AMC and **Mr. Rajiw Lochan**, Convener, Conference and Jt Secretary, MGMI.

The guests were welcomed with flower bouquets by Dr. NK Nanda. He welcomed the dignitaries and thanked the delegates and participants for successful completion of the event. He spoke on the Asian Mining Congress (AMC) and International Mining Exhibition (IME), highlighting some of the important topics discussed, like sustainability, environment, surface miners, safety, dump stability, international cooperation, etc.

Mr. LK Bose presented a brief summary of the technical sessions. He mentioned that a total of **58 papers** on varied aspects of mining have been presented and discussed in ten Congress sessions. He expressed his satisfaction as significant research was continuing on mining technologies, which is apparent as most of the papers in the Congress were from institutes like CIMFR, IIT (ISM), IIT Kharagpur.

Mr. IP Wadhwa, Director, Tafcon Projects (India) Pvt Ltd, talked about the IME held at Eco Park, Rajarhat, Kolkata, concurrently with the AMC. He said there has been a very good and encouraging response from the participants and this time more than 50% of the participants were new. Dr. Abbas Parwaaresh, who has been attending all the AMCs held so far, congratulated MGMI and the organizers for successful completion of the event. He said that Asia produces 11 billion tonnes of minerals annually and the AMC and IME offer great scope for planners, scientists, miners and manufacturers to exchange knowledge and help to keep abreast of latest developments.

Mr. Suresh Kumar, in his valedictory speech, congratulated the participants and organizers for successful conclusion of the event. He considered that events like the AMC help the growth of mineral industry adding that mining of minerals will continue to play a significant role in nation building. He mentioned that coal now caters to 58% of energy consumed in our country and will continue to be the main source of energy for many more years. He pointed out about the recent power crisis due to shortfalls in other sources of energy, when coal saved the situation to a large extent. Mr. Kumar drew attention to the shortage of coking coal in the country, which is resulting in import. He stressed the need for pollution-free mining and spoke about challenges in mining sector like, environment protection, cost of extraction and safety measures. He stressed on efficient mining by new technology to lower price of coal to make electricity generation cheaper. He was happy to visit the International Mining exhibition. He mentioned that many polluting industries from western world have shifted to the so called third world countries.



Mr LK Bose summing up Congress proceedings



Dr. Abbas Parwaaresh addressing at Valedictory Session



Mr Suresh Kumar delivering Valedictory Address



Mr Rajiw Lochan giving Vote of Thanks



Release of Pen Drive



The pen drive containing soft copy of the proceedings with papers presented in the Congress was released by the dignitaries. This has been given to the delegates in their kit.

President, MGMI presented mementoes to the guests.

Mr. Rajiw Lochan proposed the Vote of Thanks.

Company Presentations

Representatives from four companies made presentations in the Congress.

Mr Sudhanshu K Singh, Global Product Manager, **Caterpillar India**, delivered presentation on 'An overview of Surface Mining and Technology' on 8th November at the end of Plenary Session-I. He talked on the products and capabilities of the company, highlighting the usage, efficiency & economy of the different products manufactured by them.



Mr Prabhat Mittal, Business Line Manager (Mechanical Cutting), **Sandvik Mining & Rock Technology**, presented the products, activities and capabilities of his company on 8th November at the end of Plenary Session-II. He mainly introduced, with projections, the Low Capacity Continuous Miner (LCCM) technology for underground coal mines. He explained that LCCM is a solution for sustainable growth of small capacity UG coal mines up to 1000 tpd.

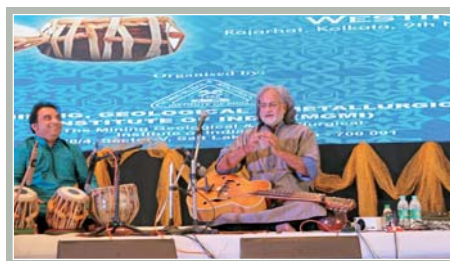
On 8th November at the beginning of Keynote Session Mr Dennis Narozhnyi, Mining sales engineer, talked on the products, activities and capabilities of **Howden Air & Gas India Pvt Ltd**. He highlighted development of Software Solutions as per requirement of their clients. They also design and construct large turnkey ventilation, refrigeration, gas cleansing systems and retrofitting in mining industries both for underground and open cast Mines.



Mr Rainer Raberger, Sales Manager, made a presentation on the product, activities and capabilities of **Andritz Separation & Pump Technologies India Pvt Ltd** (of Andritz, Austria) on 10th November at the end of Technical Session-VII. He highlighted their product in Heavy Duty Belt Press and the benefits to the customers such as highest throughputs, lowest required residual moisture, optimized flocculants consumption, reliable non-stop operations, flexible operation parameters & easy access and maintenance.

Cultural Programme

A cultural programme was organized at the evening of 9th November 2017. **Padma Bhusan Maestro Pt. Vishwamohan Bhatt**, Grammy-winning Hindustani classical music instrumentalist and **Maestro Pt. Prodyut Mukherjee**, an eminent percussionist, enchanted the audience with masterly playing of Mohan Veena and Tabla.



In line with the theme 'International Cooperation in Innovative Technology for Growth of Mineral Industry', the Congress provided a forum for the miners, planners and policy makers to discuss the various issues affecting the mining industry in the Asian region in particular, and also in the rest of the world. The speakers, experts in their own fields of activities, deliberated various aspects of mining and mineral industries during their presentations. A committee taking note of deliberations during the technical sessions formulated the following recommendations primarily for India, and other mineral rich countries of the region.

1.0 Exploration

- 1.1 In view of the increasing demand for minerals and depletion of shallow or easily accessible deposits, the Congress strongly recommends to intensify exploration efforts for assessment of mineral resources, even small and deeply buried deposits, and including oil shales, shale gas and gas hydrates, by adopting advanced exploration techniques, like remote sensing, multi-sensor aero-geophysical survey and other geophysical and geochemical tools if necessary by collaborating with international expert agencies.
- 1.2 The Congress recommends implementation of the National Mineral Exploration Policy (NMEP) by stepping up exploration activities, both over land and offshore, including deep sea, for all minerals, by enhancing the use of state-of-the-art geophysical and geological techniques so that all concerned stakeholders are geared up to contribute to the proposed National Geoscientific Data Repository.
- 1.3 The Congress also recommends intensification of exploration using advanced and innovative techniques for rare earth and strategic minerals, including those essential for emerging technologies, both in public and private sectors. Such minerals trapped in buried channels in coastal areas and under different land covers also should be categorically assessed and information made available to the relevant data repository.
- 1.4 The Congress recommends suitable Government intervention in the form of incentives and liberalized policies for rapid expansion of mineral exploration in the country with due consideration for environmental and economic aspects. Utilization of the fund as being collected in the form of exploration cess and lying with the state governments concerned needs to be expedited.

2.0 Underground and Opencast Technologies

- 2.1 The Congress recommends to avoid large fleets of small diesel operated transporting equipment for coal and mineral transport using outsourced contractors and recommends adoption of other environment friendly modes like closed circular conveyor systems for short distances and covered rail, pipeline or river transport over long distances.
- 2.2 Adoption of blast-free mining techniques as much as practicable is recommended to avoid adverse impact on neighbouring areas.
- 2.3 For optimal energy utilization, ensuring safety of equipment and personnel and to maximize capacity utilization of machinery, the Congress recommends that the industry should adopt innovative and tailor-made monitoring and tracking systems using advanced Information and Communications Technology, Remote Sensing and intelligent sensor deployment.
- 2.4 Emphasis on human resource planning has been underscored by the Congress so that skill and competence developed within the industry can ensure availability of well-trained and skilled manpower for safe, environment-friendly and socially responsible mining operations.
- 2.5 Considering bad economy, technical obsolescence, lack of productivity and potentially unsafe conditions, the Congress recommends that the coal mining companies operating small underground mines should make efforts to either modernize or close such operations.
- 2.6 The Congress recommends highwall mining for extraction of coal in left-out areas or unapproachable areas wherever possible.
- 2.7 Use of mass-production technologies employing powered-support longwall or continuous miner is recommended, wherever feasible, so that internationally comparable standards of productivity and safety can be achieved.
- 2.8 Suitable R&D and pilot-scale trials may be undertaken for improving productivity and safety by mining companies with funds especially earmarked for such activities and from Government schemes if available. Such projects may be carried

RECOMMENDATIONS

out in collaboration with academic/ research institutes within the country or elsewhere if necessary. For the coal industry the trials may include introduction of proper technology and equipment for extraction of coal reserves lying locked in pillars, extraction of Coal Bed Methane (CBM) / Coal Mine Methane (CMM) / Abandoned Mine Methane (AMM) from gassy seams and from un-mineable and abandoned mine reserves, improve extraction percentage from thick seams, monitoring of stability of subsidence-prone surface and dump or pit slopes in vulnerable areas and for dealing with other constraints in both opencast and underground operations.

- 2.9 The Congress recommends special attention to be taken by all stakeholders to combat the coal fires that are causing huge loss of coking coal reserves and threatening safety, if necessary with assistance from expert agencies in India or abroad. It is recommended to speed up the long-drawn process and save precious national resources.
- 2.10 The Congress recommends gearing up R&D activities to develop technology to use good quality non-coking coal in place of coking coal as well as looking into alternate uses of coal to reduce import dependence as much as possible.

3.0 Mineral / Coal Processing and Beneficiation

- 3.1 The Congress recommends adequate regulatory control to be evolved for disposal of washery rejects. It further emphasizes that the excessive quantity of extraneous matter in raw coal mainly from opencast mines can be deshaled economically in Jigs (pulsating screens or air chamber underneath the coal bed). Such deshaled coal can either be consumed in thermal power plants resulting in reduction of air pollution or re-washed in deep coal washers to produce high value clean feed for gasification, liquefaction or for the production of Activated Carbon.
- 3.2 Considering the problem of handling small particles that aggravates during monsoon or after wet washing, the Congress recommends installing synthetic liners at the silo and bunker bottoms, or air blasters may be incorporated in suitable places to improve flow characteristics of sticky minerals and coal.

- 3.3 The Congress recommends utilization of iron ore fines from tailing ponds using available and advanced techniques.
- 3.4 The Congress recommends R&D initiatives for using online image analysis classifying iron ores into different types like hematite, magnetite, limonite and siderite for selection of specific beneficiation techniques for optimal final product.

4.0 Environment

- 4.1 The Congress recommends controlled blasting to reduce noise and fly-rock, or use of ripper-dozers and surface miners wherever possible. Establishing a green verge around the operational area to arrest movement of dust, setting up welfare facilities and other channels of communication with the affected locality were considered important and were reiterated in order to improve the overall environment around mining areas.
- 4.2 While highlighting the remarkable work done for land restoration in mined-out areas in some Indian states, various deficiencies and constraints at many places were discussed in course of deliberations. In areas where mineral extraction has been partially carried out but deeper resources remain for the future, which do not allow full land reclamation, the Congress recommends converting the extracted zone to some form of public use in consultation with the local authorities instead of keeping the void open.
- 4.3 Deliberations in the Congress suggested greater emphasis on eco-friendly mining and handling of tailings / rejects were essential for sustainable growth of the industry.
- 4.4 The Congress recommends that the mining industry pays adequate attention to create social and environmental benefits by carrying out production and marketing of minerals using greener and efficient technologies that leave minimal adverse environmental footprints.

5.0 Workplace Safety and Health

- 5.1 In spite of substantial improvement in safety standards resulting in decline in fatality rates in mines, the pace of improvement has slowed down considerably and the rates are still unacceptably higher than some of the other mining countries.

The model of outsourcing and contract work has been on the rise, and contractual and hired workforce have been found more prone to accidents. These aspects were discussed in the Congress, which urges the authorities to take appropriate remedial measures.

- 5.2 The Congress recommends changing the present compliance based culture to self-regulatory culture, so as to effect a comprehensive change in attitude and policy from reactive to operative mode to bring about further improvement in Safety Standard.
- 5.3 The Congress recommends adopting Risk Assessment Based Safety Management System and monitoring implementation of the same for achieving Zero Harm in the Mining Sector.
- 5.4 Learning a lesson from past accidents / incidents along with active implementation of corrective measures should be considered essential for reducing accidents of repetitive nature in future. The Congress further recommends adoption of advanced hazard monitoring and detection systems to reduce incidents of mining disasters.
- 5.5 The Congress recommends that adequate steps should be taken for a quantum jump in quality of training and education and periodic refresher training for all categories of workmen, including the contractual workforce. Greater use of modern training aids, like simulators of mining equipment, is required to build up necessary skill and familiarity with safe practices in all conceivable scenarios.
- 5.6 Strict supervision of safety and health standards by use of mandatory appliances for protection against noise, dust and other protective devices along with strict adherence to working hours, including mandatory health checkups must be followed widely.

6.0 Policy Matters

- 6.1 In view of the recent Mineral (Auction) Rules 2015, the state governments are urged to see that mineral blocks on offer have adequate resources to enable economic viability and are available to developers for sufficiently long periods to encourage further exploration and exploitation from deeper horizons.
- 6.2 The Congress recommends initiating a study by the appropriate authority for rationalization of royalty

rates in order to make the indigenous industry globally competitive.

- 6.3 The Congress recommends steps should be taken to encourage value addition locally to derive maximum benefits from natural resources of the country and export of minerals should be through strict regulatory control.
- 6.4 The Congress recommends a review of the recently introduced system of competitive bidding for mineral resources. Bidding for prospecting-cum-mining lease without adequate knowledge of the deep-seated reserves was considered unlikely to be beneficial for either the state or the miner. Similarly, non-exclusive reconnaissance permit without any assurance of further leases later also appeared in the opinion of some not an attractive enabler for healthy growth of the mineral sector. A review of these provisions by the appropriate authorities was sought.
- 6.5 Regarding transport of coal and other major minerals, it was recommended that reliance on roads should be reduced as much as possible. Besides augmenting rail infrastructure wherever feasible, development of inland waterways should be undertaken as these are likely to offer cheaper and a more environment-friendly alternative.
- 6.6 The Congress recommends long-term leasing of land for the duration of mining, and return of the fully reclaimed land after mining to the owners so as to facilitate original or other productive use. Regulatory authorities should permit mining without insisting on land ownership by the mining company.
- 6.7 The Congress recommends that the State governments should delineate potential mining areas as early as possible so that mineral extraction in the future is not hampered due to expansion of residential localities, setting up of road / rail infrastructure or other public facilities or other industries over mineral-bearing land.
- 6.8 The Congress recommends revisiting the taxation policy to reduce unduly high effective tax rates of up to 57% in some cases, which include contributions to National Mineral Exploration Trust, District Mineral Foundation and Corporate Social Responsibility in addition to royalty, Forest Development Tax and other local taxes and levies.

INTERNATIONAL MINING EXHIBITION (IME 2017)

ORGANISED BY



Ministry of Coal
Ministry of Mines
Ministry of Steel
Ministry of Power
Department of Heavy Industry
Government of India



Coal India Limited
(A Maharatna Company)

Focus Country Australia



Focus Country China



Focus Country Czech Republic



CzechRepublic

Focus State Jharkhand



Focus State Odisha



The 7th International Mining, Equipment, Mineral & Metals Exhibition (7th IME), concurrently held with 7th Asian Mining Congress, organized during 8 – 11 November 2017, was a grand success, as informed by the Exhibitors, Delegates, VIPs and Visitors.

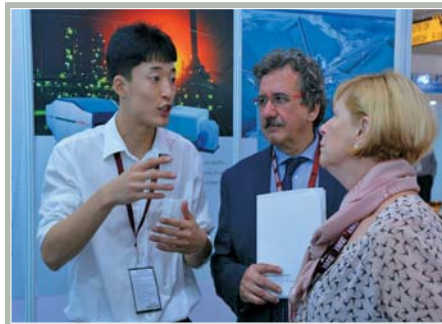
The event has been envisaged as a catalyst for the development of mining, mineral, metal and allied sectors in India. This prestigious international event of the sector is one of the largest shows of its kind in this part of the world. It is an ideal platform for the global mining, mineral and metal producers, and other stakeholders of these industries to congregate, display products, exchange technology, negotiate business for mutual development.

The event was inaugurated by **Mr. Susheel Kumar**, IAS, Secretary, Ministry of Coal, Government of India on 8th November 2017 at Eco Park, Rajarhat. Other eminent dignitaries present on the occasion included **H.E. Mr. Milan Hovorka**, Ambassador, Czech Republic, **Mr. Gopal Singh**, Chairman, Coal India Limited, **Dr. NK Nanda**, President MGMI & Director (Tech), NMDC, **Mr. AK Jha**, CMD, MCL, **Mr. KS Biswal**, Director (Finance), NTPC and **Mr. IP Wadhwa**, Managing Worker, Tafcon Projects (India) Pvt Ltd.

High level delegations from Australia China, Czech Republic, India, Iran, Italy, Japan, Malaysia, Poland, Russia, United Arab Emirates United Kingdom, United States of America and many other countries visited the exhibition.

Concurrently 'Buyer Seller Meet' was organized with presentations from stakeholders namely, CIL, NTPC, NMDC etc. It received very enthusiastic response from India and overseas.

The exhibition encompassed 200 exhibitors spread over 25,000 sq m display area. There were five country pavilions. It enjoyed 16,654 footfalls from various countries.



PREVIOUS ASIAN MINING CONGRESSES (AMC) AND INTERNATIONAL MINING EXHIBITIONS (IME)

The 1st AMC was organized in 2006 as the culminating function of year-long eventful centenary programmes. It was inaugurated on 16th January 2006, the 101st foundation day of MGMI. Concurrently, IME 2006 was also arranged. Since then, the subsequent AMCs and IMEs are being held biennially. The salient features of the AMCs are listed below.

1st Asian Mining Congress & IME 2006

Theme : **Asian Mining – Towards a New Resurgence**
Dates : 16th - 18th January 2006
Venue of AMC : Hotel The Oberoi Grand, Kolkata
Venue of IME : Netaji Indoor Stadium, Kolkata

Inaugurated by

Dr. Desari Narayan Rao, Hon'ble Minister of Coal & Mines, Govt of India, Chief Guest

Papers presented – 84

Foreign Participation from – China, Iran, Mongolia, Nepal, Oman, Pakistan, Russia, Thailand, Turkey, Australia, Germany, South Africa, Sweden, UK, USA

2nd Asian Mining Congress & IME 2008

Theme : **Mineral Resources in Asian Countries: Innovative Solutions for Exploitation**
Dates : 16th - 19th January 2008
Venue of AMC : Hotel The Oberoi Grand, Kolkata
Venue of IME : Netaji Indoor Stadium, Kolkata

Inaugurated by

Shri H. C. Gupta, Secretary, Ministry of Coal, Govt of India, Chief Guest

Papers presented – 73

Foreign Participation from – China (partner country), USA (focus country), Australia, Belarus, Canada, Germany, Iran, Japan, Poland, Russia, Sweden, UK

3rd Asian Mining Congress & IME 2010

Theme : **Resurgence of Mining in Asia: Prospects & Challenges**
Dates : 22nd - 25th January 2010
Venue of AMC : Hotel Taj Bengal, Kolkata
Venue of IME : Netaji Indoor Stadium, Kolkata

Inaugurated by

Mr. Sriprakash Jaiswal, Hon'ble Minister of State for Coal and Statistics & Programme Implementation, Govt of India, Chief Guest

Papers presented – 73

Foreign Participation from – China, Iran, Pakistan, Russia, Australia, Germany, Netherlands, Poland, Switzerland, UK, USA

4th Asian Mining Congress & IME 2012

Theme : **Sustainable Mining in Asia - Challenges and Opportunities**
Dates : 29th – 31st January 2012
Venue of AMC : Hotel Hyatt Regency, Kolkata
Venue of IME : Salt Lake Stadium, Kolkata

Inaugurated by

Mr. NC Jha, Chairman, Coal India Ltd, Chief Guest

Papers presented – 50

Foreign Participation from – USA (partner country), Australia (focus country), Austria, Belarus, Belgium, Canada, China, Czech Republic, Denmark, France, Germany, Indonesia, Iran, Itali, Japan, Norway, Poland, Russia, South Africa, South Korea, Spain, Sweden, Switzerland, Turkey, Ukraine, UAE, UK

The 5th Asian Mining Congress & IME 2014

Theme : **Scenario of Mining in Asia and Investment Opportunities**
Dates : 13th – 16th February 2014
Venue of AMC : Hotel Hyatt Regency, Kolkata
Venue of IME : Salt Lake Stadium, Kolkata

Inaugurated by

Mr. Shriprakash Jaiswal, Hon'ble Minister of Coal, Govt of India, Chief Guest

Guests of Honour

Ms. Katarzyna Kacperczyk, Hon'ble Dy. Min., Foreign Affairs, Republic of Poland

Dr. Jerzy Witold Pietrewicz, Hon'ble Dy. Min. of Economy, Republic of Poland

Prof. Piotr Klodkowski, His Excellency Ambassador, Republic of Poland

Dr. A.K. Dubey, IAS, Addl. Secretary, Ministry of Coal, GOI
Mr. S. Narsing Rao, IAS, Chairman, Coal India Limited

Papers presented – 53

Foreign Participation from – Poland (partner country), Czech Republic (focus country), China, Germany, USA, Iran, Australia, Egypt, Ethiopia, Singapore, Ukraine

The 6th Asian Mining Congress & IME 2016

Theme : **Resurgence of Mineral Industry in Asia**
Dates : 23rd – 27th February 2016
Venue of AMC : Hotel Hyatt Regency, Kolkata
Venue of IME : Eco Park, Rajarhat, Kolkata

Inaugurated by

Mr. Anil Swarup, IAS, Secretary, Ministry of Coal, Govt of India, Chief Guest

Guests of Honour

Mr. Sutirtha Bhattacharya, Chairman, Coal India Limited

Mr. Radoslaw Domagalski Labedzki, Hon'ble Deputy Minister of Development, Republic of Poland

Mr. Tim Martin, Trade Commissioner, Australian High Commission

Papers presented – 66

Foreign Participation from – Australia, Belarus, Belgium, China, Czech Republic, Finland, Germany, Indonesia, Iran, Israel, Italy, Japan, Poland, Russia, South Africa, Spain, Sweden, Switzerland, USA, United Kingdom.

Principals Coordinators

Dr. N K Nanda, President, MGMI & Director (Technical), NMDC
Mr. Prasanta Roy, Sr Manager (CV), CIL & Hony. Secretary, MGMI

Organisers

Conference (7th AMC)

Mr. A K Jha, Chairman, Conference & CMD, MCL
Mr. L K Bose, Chairman, Technical Committee & Former ED, CIL
Dr. Amalendu Sinha, Co-Chairman Technical Committee & Former Director, CIMFR
Mr. Rajiw Lochan, Convenor, Conference & Chief Manager (Geol), CMPDI

Technical Committee

Mr. L K Bose, Former ED, CIL & Chairman
Dr. Amalendu Sinha, Former Director, CIMFR & Co-Chairman
Mr. S K Choudhury, Former Controller General, IBM
Mr. Amrita Acharya, Former Coal Controller
Mr. Anup Biswas, Former DDG, Mines Safety, DGMS
Mr. B C Bhattacharya, Former CGM (WBPD), CIL
Mr. Smarajit Chakrabarti, Former CMD, ECL
Mr. Ranjit Datta, Former Director, GSI
Dr. Kalyan Sen, Former Director, CMRI
Prof. Ashis Bhattacharjee, Professor, IIT Kharagpur
Mr. Ranajit Talapatra, Sr Manager (CP), CIL
Mr. Prasanta Roy, Sr Manager (CV), CIL & Hony. Secretary, MGMI
Mr. Samir K Ghosh, Former Manager (Met), HCL
Supported by : Prof. (Dr) Khanindra Pathak, HoD, Mining Engineering, IIT Kharagpur

Review Committee

Prof. S P Banerjee, Former Director, ISM
Mr. S K Choudhury, Former Controller General, IBM
Mr. B C Bhattacharya, Former CGM (WBPD), CIL
Mr. Smarajit Chakraborti, Former CMD, ECL
Dr. Amalendu Sinha, Former Director, CIMFR
Mr. Anup Biswas, Former DDG, Mines Safety, DGMS
Prof. Subrata Choudhury, IIT (ISM) & Former CMD, CMPDI
Prof. R M Bhattcharjee, Mining Dept, IIT (ISM)
Dr. V K Singh, Chief Scientist, CSIR-CIMFR
Dr. Jai Prakash Barnwal, Former Chief Scientist, RRL
Dr. Kalyan Sen, Former Director, CMRI
Mr. Samir Kr. Ghosh, Former Manager (Metallurgy), HCL
Prof. Ashis Bhattacharjee, Professor, IIT Kharagpur
Dr. Amit Kumar Verma, Mining Dept, IIT (ISM)

Exhibition (IME - 2017)

Mr. B R Reddy, Chairman, Exhibition & CMD, SECL
Mr. V K Arora, Chairman, Buyer Seller Meet & Chief Manger, KCT Bros. Ltd.
Mr. J P Goenka, Convener, Exhibition & MD, NMC

SPEAKERS AT CONGRESS SESSIONS



Plenary Session I



Plenary Session II



Keynote Session



Technical Session I



Technical Session II



Technical Session III



Technical Session IV



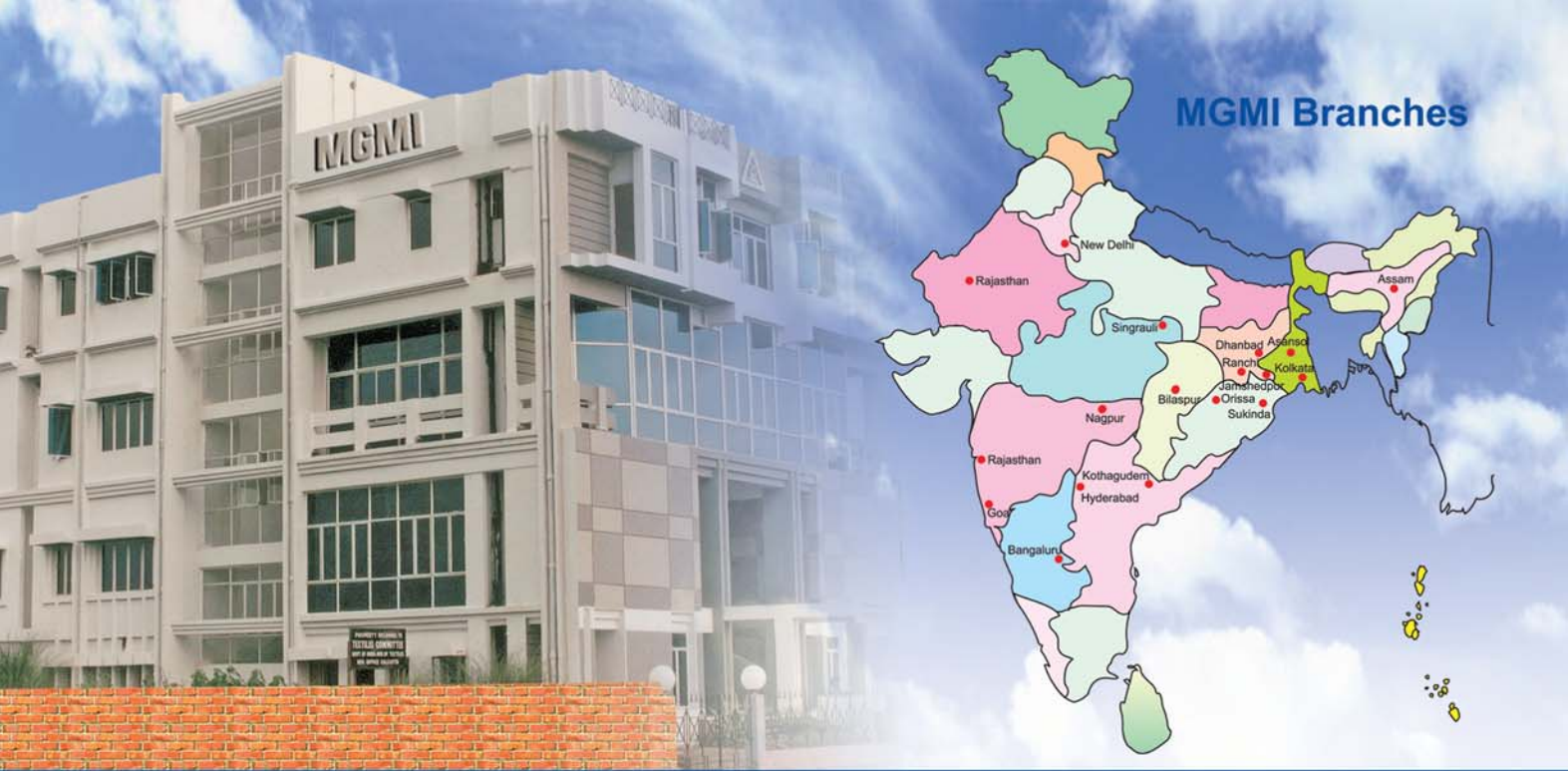
Technical Session V



Technical Session VI



Technical Session VII



MGMI Branches

MGMI HEADQUARTERS

MGMI Corporate Members



MGMI Patron Members



MGMI Donor Members



Organised by:



The Mining, Geological & Metallurgical Institute of India (MGMI)
 GM - 38/4, Salt Lake, Sector V, Kolkata 700 091, INDIA
 Phone : +91 33 2357 3482 / 3987 / 6518 | Fax : +91 33 2357 3482
 E-mail : mgmsecretary@gmail.com / mgmihonysecretary@gmail.com
 Website : www.mgmiindia.in / www.asianminingcongress.com