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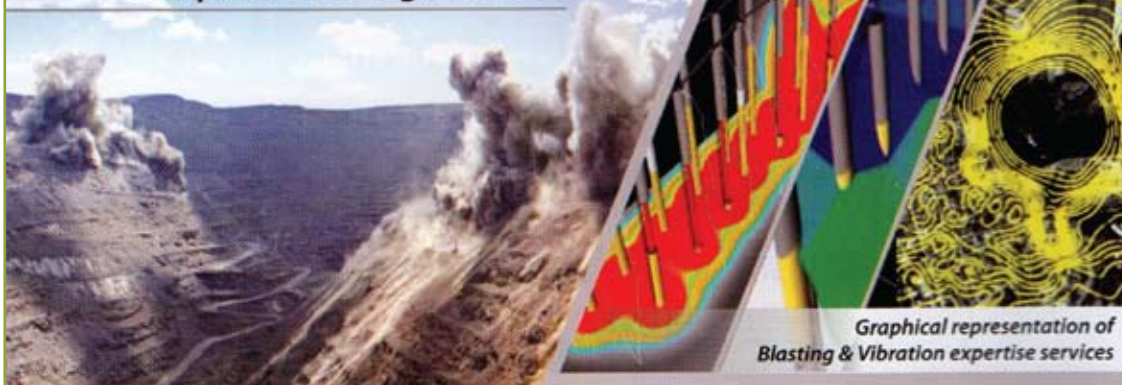
THE MINING, GEOLOGICAL AND METALLURGICAL INSTITUTE OF INDIA

Vol. 43 No. 1 April - June 2017



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Mining of Kotah stone with innovative technology.

(Curtsey : Shri SC Agarwal)

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PRESIDENT'S MESSAGE



Dear Friends,

At the very outset, I take this opportunity to convey my good wishes to you and your family members. I hope, you are keeping well with your family.

As President of MGMI, it is my second opportunity to communicate with you all.

It is a fact that for the economic growth of the country, development of mining allied industries in a sustainable manner is essential. Today most of the industries have recognized the importance of proper environment management with cost effective and efficient inter-disciplinary approaches. Driving force behind such changes are stringent legislation, global environmental issues, demand for better work environment for employees, Customers' demands, Company's image as well as growing pressure from all stakeholders regarding the environmental and social responsibilities and obligations. Environmental considerations are no longer treated on ad-hoc basis; rather environmental sustainability has become a prime objective of industries' everyday reality that industries are spending sustainable resources for better environmental pollution control and legal

compliance. Yet, there is a lack of holistic approach where environment management is a natural part of overall management system. Most of the environmental departments are busy with generating reports and petitions for external purposes and while as the same time, the top management is not making good use of the competences already available with the organization. Besides, for ensuring effective environmental management, there is urgent need of developing trained manpower in the public and private sectors in the state of the art technologies for meeting environmental compliance requirements.

The theme of the 7th Asian Mining Congress is "International Co-operation in Innovative Technology for Growth of Mineral Industry" and one of the lead topics is Environment which is very much relevant.

I would, therefore, request all of you to propagate among the Private Sectors on these issues which are very much needed considering the present scenario.


Dr NK Nanda

7th Asian Mining Congress & Exhibition

November 8-11th 2017 • Kolkata, India

Supported by :



Govt. of India

- Ministry of Coal
- Ministry of Steel



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**The Mining, Geological &
Metallurgical Institute of
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BIENNIAL EVENT OF MGMI

**7TH ASIAN MINING CONGRESS & EXHIBITION 2017 NOVEMBER 8-11, 2017, KOLKATA, INDIA
ON**

“INTERNATIONAL COOPERATION IN INNOVATIVE TECHNOLOGY FOR GROWTH OF MINERAL INDUSTRY”

The 7th Asian Mining Congress and International Mining Exhibition, a biennial event, is being organized by the Mining, Geological and Metallurgical Institute of India (MGMI). The 1st AMC and Exhibition was held in January 2006 to commemorate the Centenary of MGMI, the 2nd AMC in January 2008, the 3rd in January 2010, the 4th AMC in January 2012, the 5th AMC in February 2014 and the 6th AMC in February 2016. These events were highly successful with participation of around 20 countries spread over different parts of the globe along with large participation of various mining organizations in India.

The 7th Asian Mining Congress and Exhibition in this sequel will be held from November 8-11, 2017 at Kolkata.

Technical Sessions of the Congress will be held in the hotel, The Westin Kolkata, Rajarhat. The 7th International Mining Exhibition (IME 2017) will be held at Eco Park, Rajarhat, Kolkata.

The Congress will provide a forum for promotion and support of techno - scientific cooperation towards national and international progress in the areas of mineral production, in addition to the development of new opportunities of sustainable business that will benefit both Asian and the World Communities.

**THEME : INTERNATIONAL COOPERATION
IN INNOVATIVE TECHNOLOGY FOR
GROWTH OF MINERAL INDUSTRY**

The Lead Topics to be covered in the Conference are :

- ➡ Exploration
- ➡ State-of-the-Art Technologies : Underground and Opencast
- ➡ Development of Minor Minerals
- ➡ Offshore and Deep Sea Mining
- ➡ Oil and Gas : Shale Oil, Shale Gas, Gas Hydrate, Underground Coal Gasification, CBM.
- ➡ Mineral / Coal Processing and Beneficiation including By-product Recovery and Waste Management
- ➡ Environment – Green Mining, Climate Change and Mitigatory Measures
- ➡ Workplace Safety and Health Issues
- ➡ Technical Innovation : Specific Case Studies
- ➡ Investment Opportunities in Mineral Sectors
- ➡ Policy Matters and Mining Legislations
- ➡ Merger and Acquisition in Mining Sector
- ➡ Infrastructure and logistics
- ➡ Application of Information Technology, Communication and other Smart Technologies like E-application, E-pricing, E-tendering, E-auction, etc.

Call for Papers : Technical Papers are invited from participants on the lead topics for the Congress. The last date for submission

of **Abstract is August 15, 2017** and **Full and final** papers will be required by **September 15, 2017**.

IME 2017 : MGMI & TAFCON joined hands to


create a comprehensive and an all encompassing ideal platform for mine operators, planners and policy makers to discuss the various issues affecting the Mining Industry of the Asian Region in particular and also in the rest of the world.

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UNBUNDLING COAL INDIA

NITI Aayog, the government's policy think-tank, is going to finalise the 'National Energy Plan' shortly. As the information goes, the plan is to be finalised after consultation with all the stakeholders and it will be a roadmap for energy security of the country up to 2040. It is understood that NITI Aayog's National Energy Policy in draft form would be posted on the commission's website in a couple of months. The National Energy Policy is likely to answer issues relating to India's transition to renewable energy, universal access to power by 2022, lowering import dependence, increasing energy security, etc.

Coal is the most dependable source of energy for the country and this will have a big role to play in the upcoming National Energy Policy. But this industry is burdened with many problems. All attempts for increasing the domestic coal supply to the energy hungry consuming units up to the expected level is failing year after year.

Mining being a land based industry, problem of land acquisition has become a chronic obstacle in implementing the mining projects. It is unfortunate that the private investors in mining of coal, till now, could not come up to a expected level. Delay in making the land available required for excavation to start is one of the reasons for failure of the private investors too. In fact private investors who are allotted with the coal blocks cannot afford to wait for acquisition of mining land for indefinite time, (sometimes even 10 years as experienced by public sector coal miner, Coal India). Ultimately the coal consumers, particularly, the power sector has to depend on Coal India only for supply of around 80% of its feed. Therefore, all eyes are on Coal

India to find out a workable solution for a prudent energy security of the nation.

Many prescriptions have been pushed in for improving Coal India's operational efficiency fulfilling the quantity and quality aspiration in the supplies. But not much positive result has come out yet. Recently, while briefing about the work of the government think-tank, Arvind Panagariya, Niti Aayog's vice-chairman opined that "The (coal mining) sector works almost through administrative allocation. Yes, auctions of coal mines are done but still a large part of it is administrative allocation and that has a not so good effect on price discovery. So, if we unbundle (the Coal India) and if we allow competition, it will have a favourable impact and bring transparency in pricing" (The Telegraph, 02/06/2017). The Aayog has suggested that coal mining should be based on competition to determine the fossil fuel's market price. In a meeting with Prime Minister on May 13, Niti Aayog had suggested unbundling of seven subsidiaries of Coal India, on the plea that there was an absence of a coal market in true sense in India and the cost of passing-through electricity tariff was making mining inefficient.

The experts of the coal consuming industry also felt that the current pricing of coal by public sector companies is not very transparent. They felt that the afore-stated policy change would result into competition between companies in terms of pricing. The readers may recall some time ago there was a plan to constitute a coal regulatory body which would stabilise price that the companies can charge and increase transparency. But the plan did not materialise. Now the Government and the people in the

industry (who matters) feel creating competition among coal companies might bring the coal price down. This is the opinion expressed in press by the former power secretary Uma Shankar too.

In the current scenario ultimately it boils down to Coal India be broken down to seven independent companies which will lead to higher efficiency through competition and will lead to determination of the fossil fuel's market price. However, a similar proposal was made by the government back in 2014, which saw heavy resistance from the company's worker unions (having a membership strength of around 350,000 employees). Ultimately, the plan was scrapped then.

Let us recapitulate some of the historical events during past few decades. Restructuring of Coal India, I remember, was a hot topic decades ago in nineties, based on observation of the World Bank team while considering providing soft loan / aid to Coal India to enhance its production capability and implementation of a social and environmental impact mitigation project. World Bank observed good scope of improving operational efficiency in the Coal India subsidiaries through restructuring. However, ultimately nothing came out till World Bank Projects were being implemented. Meanwhile import of power coals continued increasing year after year.

Again probably around 5-6 years ago a government committee urged the ministry to restructure the world's largest coal miner to help reduce shortage of the fuel, which accounts for more than two-thirds of the power generated in the country. In line with it Government appointed an expert consultant company, M/S Deloitte for study and provide recommendation on restructuring of Coal India. It is understood, Coal Ministry is studying the report of the consultants and considering the

recommendations on restructuring options for Coal India. But the state behemoth is failing to meet its output target for years despite having access to large reserves.

Shri PS Bhattacharya, former Chairman Coal India, commented on the topic that "Have seen this suggestion of breaking Coal India prop up at regular intervals of 4 to 5 years over the last 25 years. Was hopeful that the debate would close with the stellar IPO of 2010 - by far the largest so far, exhibiting unmistakably the faith reposed by investors globally in the current organization". Further he rightly observed, "By dissolution of CIL, the governance in the coal sector will take a severe hit. It would be incorrect to expect the Ministry of Coal deliver the role that Coal India Ltd plays today in ensuring proper governance in the subsidiaries. (It's very unfortunate) The Government has not been able to deliver on its most important task of providing continuity of top leadership at the subsidiaries. Quite a few subsidiaries are without regular CMDs for more than a year. If the problem has not surfaced severely in terms of mismanagement, high accident rates etc, it is singularly due to CIL filling up the leadership gap.

Lastly, CIL today is the only Indian company that rightfully claims to be the largest in the world as a coal mining company. The largest companies in other sectors such as oil & gas, power, steel etc though big are not big enough to lay claim on being the global top slot.

Government should seriously reconsider" (before going ahead for unbundling Coal India).

Here, we would like to list out some of the mine level points that eating away the efficiency of the Coal India subsidiaries :

Coal India's flag is high only because of performance of the opencast mines. But the two companies e.g. Eastern Coalfields Limited

and Bharat Coking Coal Limited having good number of underground mines and mixed mines are limping behind. In one of the studies, conducted by one consultant organisation on reorganisation of the underground mines for augmenting production in ECL, it came out that there were ample scope of closing many of the mines without affecting performance figures. Observation revealed -- (i) there were mines being run only for pumping water from the abandoned inclines to cater domestic water to the community, (ii) there were mines being operated at high cost of production just to provide employment to some people, (iii) there were mines having scope of amalgamation with neighbouring mines enhancing production and reducing cost, (iv) small mines were being operated at high cost even for keeping the local market alive. A thorough study will reveal scope of reorganisation amounting to closing / amalgamation / expansion of small underground mines improving overall financial statistics

of ECL and BCCL mines. It is obvious, the companies like ECL and BCCL will come out as big obstacles while unbundling the current subsidiary companies as it is.

In the above historical background, the decision of the Niti Aayog on "Unbundling of Coal India" seems to be the only cards to play by the Government.

While writing the editorial the news came that the "Public sector miner Coal India has decided to close 37 unviable underground coal mines and re-deploy manpower from the sites to cut losses suffered on lifting coal from these mines" (Telegraph June 11). A step in right direction.□

Bibhas C Bhattacharya

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TALK BACK

Splitting the Coal India

My dear Bibhas,

MGMI is continuing to play better pivotal role in mining, metallurgical and geological fields and you are performing honorary editorial work very well.

In management parlance, when a company performs well, everyone tries to take credit and bask in the glory and if there is downturn blame throwing starts. Coal India Ltd for last several years was doing marvellously well and there was upswing in share markets, except for last year due to several reasons. Even though, CIL production was better than last year, there is a lobby, mostly from private investors, for dismantling Coal India. Mining is most dangerous peacetime profession and coal mining is more so because of danger of gas and coal dust explosion. Nationalization

of coal mines was done for safety, meet increasing demand of coal, prevent exploitation of labour and also because private owners were not risking investment. There have been demands of privatization off and on and CIL is also compelled for outsourcing because of retirements of departmental employees and reduce cost to please shareholders. Compared to CIL, performance of coal block allottees, including auctioned mines are far below projection of ministry of coal.

Although countries with cheap oil resources, are gradually switching over to oil and other alternative energy sources, but India is still burdened with very high import cost of petroleum products. India is also developing alternate energy sources like solar, nuclear and so on, but energy demand projection is very high, as can be seen from the following table taken from 2017 publication in MTOE.

INTERNATIONAL ENERGY OUTLOOK

Region/country	2012	2020	2025	2030	2035	2040
India	666	841	921	1,014	1,185	1,480

Inventory of Geological Reserve of Coal and Lignite in India as on 1-4-16 including proved, indicated and inferred is 44,594.53 (Mill. Tonnes) mostly in low grade. Technologies are available for such coal for power generation like Fluidized Bed Boiler, for steel making by Direct Reduction methods like improved sponge iron. Therefore, coal production by all methods have to be stepped up also in auctioned coal blocks, facing multifarious problems. Moreover, trade unions operating in coal industry are very active and govt and private owners would face serious law & order problems.

Overall, country's coal production in 2016-17 was about 3% higher as compared to last year, power demand should increase at about 6%. Power sector consumes about 75% of overall coal production so that would mean that our total coal requirement should be around 780 million tonnes, about 790 million tonnes for the entire country in 2018.

Furthermore Coal India has developed very organized management structure, although discipline and work culture need to improve further. Unbundling of Coal India could result

in chaotic situation and affect entire future expansion plans developed by CMPDI and Ministry.

With best wishes,

Yours sincerely,

Binay Samanta

LM-2077

Director, Project & Environment Consultants

July 6, 2017

(From the Editor : Points raised in the letter is thought provoking. There is an uproar in the industry on the view of the Niti Yaog on "unbundling of the Coal India" (readers may like to see the Editor's page of this issue).

A Complement

Dear Bhattacharyaji,

First let me compliment you all for the excellent formatting and quality of contents of the 'Spring - 2017' issue of the MGMI News Journal. It makes one to feel like reading with interest.

My special thanks for the News Item 'Achievement of our Member' on my Award offered by the University of Queensland (UQ), Australia. I do appreciate it.

Bless you all.

Rao

(Tadimetry Chakrapani Rao)

June 20, 2017.

He writes again on June 22

Dear Bhattacharyaji,

I deeply appreciate your kind letter.

Since, you are also concerned about the "role of Professional Societies", particularly one like MGMI, let us share some thoughts sometime on phone. Any day after 4pm is O.K. with me.

Bless you,

Rao

June 22, 2017

(From the Editor : Many thanks, Sir, for the complements. It's my pleasure, we can definitely talk and share our views.

We, the members of the MGMI, will be very happy and look for sharing your valuable experience and thoughts on the happenings of mineral industry in India and abroad. It will be nice if you time to time contribute write ups in the MGMI News Journal.)

An Encouragement

Congratulations for excellent publication and coverage. We should give highest importance on Safety aspects in mining. There should be regular feedback on Lalmatia accident.

LK Bose

June 21

(From the Editor : Many thanks, Sir. The investigation report of the Lalmatia accident is awaited. The column 'Safety and Health Issues' is a recent addition in the Journal. As advised, this will be given highest importance.□

HEADQUARTERS ACTIVITIES

The 874th Council Meeting was held on 4th February, 2017 at Hotel Hyatt Regency, Kolkata on Saturday at 11.00 a.m.

Dr. NK Nanda, President was in the Chair. The meeting was attended by Prof Banerjee S P, S/Shri Ritolia RP, Jha NC, Saha RK, Goenka JP, Acharya A, Arora VK, Biswas Anup, Bose LK, Chakrabarti Bhaskar, Choudhury Akhilesh, Dhar Gautam, Ghosh Samir Kr, Guha Phalguni, Karmakar AK, Prof. Karmakar GP, Prof. Ray SC, Dr. Sinha Amalendu, Prof. Annavarapu Srikant, Dr. Singh PK, Shri Wadhwa IP, Shri Datta Ranjit, Talapatra Ranajit and Roy Prasanta.

ITEM No. 0 Opening of the Meeting

0.1 Shri Prasanta Roy, Hony. Secretary extended welcome to all members and requested Dr. NK Nanda, President to Chair the Session. The meeting was chaired by the President, Dr. NK Nanda.

0.1.1 Leave of absence was granted to those who could not attend the Meeting.

0.2 President welcomed the Past Presidents, all members of the Council and Guests.

Condolence : One minute silence was observed in memory of late Kamal Dasgupta (LM : 10494) and Dr. Narayan Das Mitra (LM : 1849).

The Hony. Secretary appraised the house that late Kamal Dasgupta passed away on 17th December 2016. He became life member in 2013-14. He did B.Sc (Hons) in Geology and Geophysics in 1958 from IIT, KGP. He worked in various positions in CMPDI, Ranchi and rose to the post of Chief of Geology and Drilling. His

specialization was in Coal Mining, Geology and Exploration. Dr. ND Mitra passed away on 2nd February 2017. Late Mitra became Life Member during 1964-65. He did M.Sc. (Geology) and PhD. Late Mitra was one of those instrumental for foundation of MGMI, Kolkata Branch. He was actively associated with almost all activities of MGMI. He was Honorary Editor of MGMI for many years. He worked in GSI and retired as Sr. Deputy Director General.

Prof. SP Banerjee, Shri LK Bose, Shri Akhilesh Choudhury, Shri Bhaskar Chakrabarti briefed about Late Dasgupta and Mitra.

President there after took the agenda items.

874.1.0 To confirm the minutes of the 873rd meeting of the Council held at Kolkata on 12th November, 2016.

The Minutes were circulated to all Council members. So far, no comments were received. The Council then resolved that :

Resolution : Be it resolved that the minutes of the 873rd (1st meeting of the 111th Session) meeting of the Council held on 12th November, 2016 at Kolkata are confirmed.

874.1.1 To consider matters arising out of the minutes.

The Council then considered the Action Taken Report on the Minutes of the 873rd Council Meeting held on 12th November, 2016 at Kolkata and noted the report.

874.2.0 To discuss about the 7th AMC

Shri LK Bose briefed about the Theme and Lead Topics of the 7th Asian Mining Congress. The Council approved the following :

Chairman, : Shri LK Bose
Technical Committee

Co-Chairman, : Dr. Amalendu Sinha
Technical Committee

Chairman, : Shri VK Arora
Buyer Seller Meet

Convenor, : Shri JP Goenka
Exhibition

Convenor, : Dr. Debasish Sarkar
Conference

Prior to the Council Meeting, Shri IP Wadhwa, Managing Worker of M/s. Tafcon briefed about the progress of the Exhibition and made some suggestions to organize the event in a better way.

874.3.0 To discuss about the collaboration with CIMFR

The Council principally agreed to the proposal of starting a training programme on Mines

Safety Techniques collaboration with CIMFR, Dhanbad. Council advised that a brief proposal along with relevant MoU to be prepared and submitted to the Council for consideration. In this connection, the Council authorized Dr. Amalendu Sinha, Council Member to discuss with Dr. PK Singh, Director, CIMFR for framing out the proposal and MoU.

874.4.0 To consider applications for membership and the membership position of the Institute.

- a) The Council approved 06 (LM – 05 and M - 01) applications for membership out of 09 applications received. One application was not considered due to not having requisite qualification as per revised rules (MOA).
- b) The Council noted the Present position of membership which is as follows.

Membership Position (As on 04.02.2017)

	12.11.2016	Add	Trans	Loss	04.02.2017
Member	264	01	-	-	265
Life Member	2450	05	-	02	2453
Associate	39	-	-	-	39
Student Associate	06	-	-	-	06
Life Subscriber	32	-	-	-	32
Subscriber	01	-	-	-	01
Donor	02	-	-	-	02
Patron	04	-	-	-	04
Corporate	08	-	-	-	08
	2806	06	-	02	2810

874.5.0 Any other matter with the permission of the chair.

- i) To discuss on the minutes of the Editorial Committee Meeting held on 14th January 2017.

The Council considered the recommendation of the Editorial Committee that for the time being, next two to three issues of MGMI Journal may be printed for distribution amongst the members and will be sent parallelly by post as well as by email to those having email Ids. Thereafter on observing the reaction, firmed decision would be taken.

- ii) To discuss on the opening of a bank account for 7th Asian Mining Congress and

closing of the account of 6th Asian Mining Congress.

It was decided that a bank account in the name of the **"7th Asian Mining Congress"** will be opened and the account of the 6th Asian Mining Congress would be closed upon receiving the last due and the amount lying in the said account would be transferred to MGMI Main A/c (10224931340).

It has been resolved that the A/c of the **"7th Asian Mining Congress"** will be operated upon jointly by any two of the Hony. Secretary, Hony, Jt. Secretary and Hony. Treasurer of MGMI

The meeting ended with vote of thanks to the Chair at 12.00 noon.□

will forget what you said. People will forget what
you did. But people will never forget how you made
them feel : Maya Angelou

BRANCH ACTIVITIES

Ranchi Branch

Report on the 1st Technical Session (2017-18) of MGMI Ranchi Branch held at CMPDI, Ranchi on 26.05.2017

A Technical Session of the MGMI, Ranchi Branch was held at the Koel Hall, STC Building, CMPDI (HQ), Gondwana Place, Kanke Road, Ranchi (Jharkhand) on Friday the 26th May 2017 at 05.30PM. The session was attended by 45 eminent MGMI members and their professional guests.

At the outset of the session, Dr. Anindya Sinha, General Manager (S&T/Blasting), CMPDI (HQ) and Hony. Secretary, MGMI Ranchi Branch welcomed all the MGMI members and their guests. Dr Sinha was happy to announce that the MGMI Ranchi Branch is in a position to organize such technical session on a regular basis participated by senior as well as junior members of MGMI and thanked the MGMI Ranchi Branch members for their continual patronage and support. During the session, MGMI Ranchi Branch was inspired by the august presence of Sri Binay Dayal, Director (Technical), CMPDI. He was happy to know the activities of MGMI Ranchi Branch which are being taken up on regular basis.

Later, Dr. Anindya Sinha introduced today's seminar topic and the author of the technical paper to the audience. In this session, a technical paper titled "Integrated Non Coking Coal Washery - A Case Study of Amrapali OCP, CCL" was presented by Shri Prasoon Kumar Sinha, Chief Manager (Excv.), CMPDI. Sri RD Rai, Former CMD, WCL and a veteran member of MGMI, presided over the technical session and Sri KK Khadiya, Former Director (Tech), CMPDI as Session Rapporteur.

In this occasion, Sri JN Singh, Former Director, WCL, Sri RP Thakur, Former Director, SECL, Sri VK Singh, Former CGM & Former Member of Environment Advisory Committee (Coal & Thermal), MoEF & CC, and Sri MC Singhal, Former CGM, CCL also graced the occasion with their esteemed presence and enriching suggestions.

Formal vote of thanks was delivered by Sri Jayant Chakrabarty, Chief Manager (Excv.), CMPDI and Hony. Treasurer, MGMI, Ranchi Branch.

Bhubaneswar Branch

Report on the Executive Committee meeting of the Bhubaneswar Branch held on April 28, 2017

To begin with condolence for Late SN Padhi, Former Chairman, MGMI Bhubaneswar Branch was held in the Committee room of Institution of Engineers (India), Odisha state center, Bhubaneswar with offering of floral tributes to his photograph, and observing two minutes silence by all the members present. His biodata was read out by Sri GS Khuntia, Vice Chairman who narrated his fine personality, goodness, and helpful positive attitude towards all. Shri Khuntia narrated the significant contribution of SN Padhi to mining Industry of India. He also narrated about his memorable personal association with him from ISM days (1958 onwards) till his demise. All present felt with heavy heart the loss of a "Great Legendary figure who was a great source of inspiration to all. All offered deep condolences to the Bereaved Family.

Thereafter Sri Khuntia asked for the Executive Committee Meeting to proceed.

Following Executive Committee members were present :

1. Sri GS Khuntia, Vice Chairman
2. Sri DK Mohanty, Hony Secretary
3. Sri PK Mishra
4. Sri Abhiram Sahu, Treasurer
5. Dr SK Biswal, HOD, RRL, Bhubaneswar
6. Sri JP Panda, Committee Member
7. Sri SK Das, Committee Member, DyGM (Geology) OMC Incharge
8. Sri PK Mishra, Co-opted Committee Member
9. Sri IN Praharaj Co-opted Committee Member

Special Invitee

10. Sri AB Panigrahi, Former Controller of Mines, IBM.

Agenda Points Discussed

- 1) Sri DK Mohanty, Hony secretary stated that for smooth functioning of Branch there has to be a Chairman to preside over the meetings, advise on day to day matters/ activities for future course of actions. Accordingly it has been proposed that Vice Chairman Sri GS Khuntia to take over the position of Chairman of the Branch. Shri Mohanty stated the contribution of Sri Khuntia in expanding membership with 40 new members helping exceeding a total tally of over 65 members at present. Besides Shri Khuntia took a lot of pain and efforts for the Bhubaneswar Branch to be functional and receiving the Special Growth Award from MGMI Headquarters on 20/9/16 in Grand Oberai Hotel, Kolkatta. This proposal was seconded by Sri Abhiram Sahu, Treasurer/ Addl GM, OMC. It was appreciated by all present that Sri Khuntia's dynamism will

continue to help the Bhubaneswar Branch to reach new heights from strength to strength.

- 2) Sri GS Khuntia proposed the name of Sri AB Panigrahi, Former Controller of Mines, IBM as vice Chairman, stated that his Life membership application has been sent to MGMI-HO few days back and his name was seconded by Sri DK Mohanty and was accepted by the member present. Sri Khuntia also stated that Sri Panigrahi as Vice Chairman shall contribute significantly for cause of our Branch as entire Mining Industry is known to him as he has worked in IBM Offices at Bhubaneswar /Goa/ Kolkata/Nagpur in Senior positions.
- 3) **Bank Balance** - Sri Khuntia explained about Bank a/c in Axis Bank Bhubaneswar with a balance of Rs 3,17,811 as on 28/4/17. He met VP of Axis bank, BBSR with a letter and requested that "Minimum balance be allowed to us at Rs 10000/ and not Rs 25000/ and not to impose penalty of Rs 1000/month for balance lower than Rs 25000/. In fact penalty was being levied for last 3 months, however on his request minimum balance was fixed at Rs.10000/- and the amount deducted were reversed.
 - (b) PAN for MGMI, BBSR already done
 - (c) Letter head is printed as per advice of the Committee, Seals were made.
 - (d) One Advertisement of Rs 20000/ was received from "M/s Jindal Power & Steel" and same will be printed in a "Small local Bulletin". Copies will be sent to the Advertiser.
- 4) Sri AB Panigrahi, Vice Chairman-Elect / Former Controller of Mines, IBM opined that we have to make the Branch programs interesting so that members attend meeting regularly and contribute whole hearted supports.

5. Members present opined that frequency of meetings to be once a month for some times so that we gain strength/momentum for our Branch's progress in membership for smooth functioning of Chapter.
6. Membership renewal to Life Members was also discussed and it was decided to complete the process by 15/5/17 by Hony Secretary/Joint secretary/Treasurer. Sri Khuntia stated that he has issued many reminders on this and shall pursue also.
7. About a Mega Event of Seminar of 2 days duration was decided to defer it for the next meeting. Sri Khuntia also observed that for Mega Event, he will invite Sri NK Nanda, D(T), NMDC. The Council members of the MGMI Kolkata also will be invited. 10-15 papers will be presented. Personalities like CS, Odisha and Sri Chopra, Principal Secretary-Industry/OMC Chairman will also be invited as Guests of Honour.
8. Reading of 2 special papers by Sri GS Khuntia and Sri AB Panigrahi, was deferred for next meeting when participation will be better.
9. The meeting ended with Vote of thanks to the Chair.□

There are no regrets in life. Just lessons : Jennifer Aniston

NEWS ABOUT MEMBERS

(As on 07.04.2017)

DR. MVR Murti, (6350 – LM) MMGI is now at H. No. 1-145, Ramalayam Veedhi, Gudivada Village, Pedamanapuram P.O., Gajapatinagaram Mandalam (TQ), Vizianagaram Dist. Andhra Pradesh, Pin : 535 580, email : mvmurti@gmail.com,

Shri Anjan Mukhopadhyay (6731-M) MMGI is now at Flat No 301, 149 Southend Garden, Kolkata, Pin : 700 084 Ph : 93395 32244 email : a.mukhopadhyay_calcutta@yahoo.co.in

Shri SK Roy Chaudhuri (3210-LM) MMGI is now at B 338, Green Field (GF – Rear), Faridabad, Pin : 121 003, Ph : 0129 2512181, 9818034154

Dr Arun Kumar Panda (6638-LM) MMGI is now General Manager (Geology) HOD (Exploration) CMPDI, RI VI, Jayant, Dist. Singrauli, MP, Pin : 486 890 email : arunp42@rediffmail.com

Shri K Ramana Reddy (3365-LM) MMGI is now at Villa No 109, Aparna County, Matrusri Nagar, Miyapur, Hyderabad, Pin 500 049

Shri GK Sulanki, (9182-LM) MMGI is now at P & D, CMPDI RI – VII, Bhubaneswar,

Pin : 751 013, Ph : 9438881022 email : gksulanki.cil@gmail.com

Shri TN Gunaseelan (7796-LM) MMGI is now Director, DMT Consulting (P) Ltd., 203, Block 3B, Ecospace Business Park, Action Area II, New Town, Kolkata, Pin : 700 156, Ph : 9830024880, email : GunaseelanNarayananThekken@dm-group.com

Shri Pradeep Kumar (10515-LM) MMGI is now at Garden Tower 9, Flat Number 203, Uniworld City, New Town, Kolkata, Pin : 700 160. (M) 9836509091, email : kumarpbakshi@rediffmail.com

Shri Shankargouda M (6333-LM) MMGI is now at House number 2-13-37/38, Opp to APMC Market, Fire station Road, Lingsugur, Pin : 584 122, Karnataka, email : shankargouda52@gmail.com

Shri SK Srivastava (10451-LM) MMGI is now at Flat No H-602, Rail Vihar Street, No 64, (Near DLF-1), New Town, Rajarhat, Kolkata, Pin : 700 156, Ph : 9433007103 email : sanjsri1960@gmail.com

NEW MEMBERS

(As approved in Council Meeting on 06. 05. 2017)

As Life Member

10731- LM, Shri Hari Narayan Pandey, Degree (Min), Technical Sales, Consultant, Dossoult Systems India Pvt. Ltd., BD – 103, Kestopur, Parijat Apartment. Kolkata – 700101, Phone: 9038017885, Mail : hari.pandey@3ds.com

10732-LM, Dr. Radhakanta Konar, BE (Min), M Tech (Rock Mech), PhD (Geomechanics), Asstt. Professor, Department of Mining Engg, IIT (Indian School of Mines) Dhanbad, Jharkhand – 826004 Ph : 0326-2235739 – 40, Mobile : 9430123131, Mail : rkkoner@gmail.com

10733-LM, Shri Ram Chandra Nagar, Degree (Min), Sr. Manager (Min), Safety & Rescue Division, CIL, C2/5B, Rohini Complex, P-225, CIT Scheme – VII-M, Block – R, Ultadanga, Kolkata – 700 054, Ph : 8902496576, Mail : rcnagar22@gmail.com

10734-LM, Shri Alok Bihari Panigrahi, B Tech (Min), Former Controller of Mines, IBM, Govt. of India, Flat No. 302, Krishnakunj Apartments, Road No. 8, Unit – 9, Bhubaneswar – 751022, Mobile : 9432015189 / 8742391269, Mail : abpbbsr@rediffmail.com

10735-LM, Shri Sada Nanda Rana, AMIE (Min), MBA (HR), FCC (Metal (R), FIE (Min), Chartered Engg. (Min), Dy. General Manager (Min),

Sarada Mines Pvt. Limited, C-8, Sarda Colony, P.O. Thakurani, Barbil, Dist. Keonjhar, Odisha – 758035, Ph : 9437576987 / 9777032663 (Mobile), 06767-247142/247680, Mail : snrana@sardamines.net, 1969snrana@gmail.com

10736-LM, Shri Pradeep Morashia, BE (Elec.), MBA (Mkt), Dy. General Manager (E), NMDC Ltd, Type – IV-43-CWS, Bacheli, Dist. Dantiwara, CG – 494553, Ph : 9425266338, Mail : pradeepmorashia@yahoo.com

10737-LM, Shri Ramveer Singh, B. Tech (Min), Sr. Manager (Min), NMDC Ltd., IV/TS/FF/155, HI-TECH Colony, NMDC Ltd., P.O. Bacheli, Dist. Dantiwara, CG – 494553, Ph : 09425266326 / 09424297233, Mail : rs7751@gmail.com

10738-LM, Shri Rajesh Shrivastava, MSc (Phy), PhD, MBA, Dy. General Manager (Chem), NMDC Ltd., Type IV/09/CWS Colony, Subhas Nagar, P.O. Bacheli, Dist. Dantiwara, CG – 494553, Ph : 9425266364, Mail : rshrivastava@nmdc.co.in

10739-LM, Shri Ajoy Kumar Ghosh, B.E. (Min), M. Tech (Min), Sr. Manager (Min), Coal India Limited, Flat No. 3A, Block – S-3, Sisirkunja Housing, Madhyamgram, Kolkata – 700129, Ph : 9433003098 / 9674168156, Mail : trishnaajoy@gmail.com

UPCOMING EVENTS

SEPTEMBER 2017

28 Aug. to 1 Sept. : 7th International Conference on Medical Geology "MedGeo2017", Conference. Venue : Moscow, Russian Federation. Website : <http://medgeo2017.org/> Contact person : Yulia Bikulova. The highly topical program of the Conference will include plenary lectures, keynote lectures, courses and workshops as well as field trips, which will give the participants the better understanding of the main issues on medical geology. Organized by : Russian Geological Society. Deadline for abstracts/proposals: 10th February 2017. Check the event website for more details.

3 to 5 Sept. : 2nd International Conference on Functional Materials and Steel (ICFMS 2017)-SCOPUS, EiCompendex, Conference. Venue : Tokyo, Japan. Website : <http://www.icfms.org/> Contact person : Ms. Veronica Reed. Publication : All the registered and presented papers will be published in the proceedings, indexed by SCOPUS, EiCompendex (CPX) etc. Organized by: ICFMS 2017 Committees. Deadline for abstracts/proposals : 20th August 2017. Check the event website for more details.

14 to 15 Sept. Geological Society - The evolution of flooding and flood risk. Conference. London, United Kingdom. Website : <https://go.evvnt.com/107846-0> Contact person : Georgina Worrall. This meeting will explore how geoscience can inform changes in approaches and future policy to mitigate flooding and flood risk. Time : 9:00 am to 5:30 pm. Organized by : The Geological Society. Check the event website for more details.

20 to 23 Sept. : 2nd International Conference on Power and Renewable Energy (ICPRE 2017)-IEEE Xplore and EiCompendex, Conference. Chengdu, China. Website : <http://www.icpre.org/> Contact person : Chen Li. Publication : IEEE Conference Proceeding. Indexed by : EiCompendex? IEEE Xplore. Keynote Speakers : 1. Prof. Ching-Fuh Lin National Taiwan University, Taiwan. 2. Prof. Hassan Bevrani University of Kurdistan, Iran. Organized by : IEEE

Deadline for abstracts/proposals : 10th May 2017. Check the event website for more details.

OCTOBER 2017

19 to 21 Oct. : International Conference on Mining and Fuel Industries (CMFI-2017), Venue : Sheikh Zayed Islamic Research Center, Karachi, Pakistan, organized by : SEGMITE, Department of Geology, Federal Urdu University, Inspectorate of Mines, Department of Mines and Mineral Development, Sindh and Department of Mining Engineering, Dumlupinar University, Kutahya, Turkey. You are invited to submit abstract of your paper on the given template for CMFI-2017. Contact for Abstract Submission : Conference Secretary Prof. Suhail Anjum at <cmfi2017@gmail.com>. Contact for further details : Chief Organizer CMFI-2017, Prof. Dr. Viqar Husain (Convener SEGMITE), (Chief Editor IJEEG & Vice President AGID), Department of Geology, University of Karachi, E-mail : cmfi2017@gmail.com Looking forward to your participation in the conference.

22 to 25 Oct. : Geological Society of America Annual Meeting & Exposition (GSA 2017) Conference, Seattle, WA, United States of America. Website : <http://go.evvt.com/106030-0> GSA2017 will bring together 7000+ geoscientists from across the globe—providing a forum where they will share their latest research, build upon knowledge and communicate across geologic disciplines. Time : 8:00 am - 6:00 pm. Organized by : The Geological Society of America. Check the event website for more details.

24 - 25 Oct : International Seminar on Metallurgy and Materials (ISMM) 2017. Venue : Jakarta, Banten, Indonesia. Website : <http://situs.opi.lipi.go.id/ismm2017/> Contact person: +6285692361623. ISMM 2017 will cover a wide range of research topics in metallurgy and materials. All contributed papers will be published through the AIP Conference Proceedings. AIP Conference proceedings are an open-access proceeding publication indexed by SCOPUS. Deadline for abstracts / proposals : 2nd July 2017. Check the event website for more details.

26 – 28 Oct. : National Workshop on Slope Stability, Venue : IIT (BHU), Varanasi, Organiser : Department of Mining Engineering, IIT (BHU). The Workshop will address the issues on slope stability, exchange views on best practices and state of the art stability technologies, design implantation and performance monitoring. Contact : Dr. Rajesh Rai, Convenor / Prof. BK Shrivastava, Chairman. Pl see the website : www.itbhu.ac.in/min/slpe.html , or www.slope17.com for details.

NOVEMBER 2017

1 to 3 Nov. : International Conference on Renewable Energy and Environment (ICREE 2017)--IEEE, EiCompendex and Scopus, Conference. Toronto, Canada. Website : <http://www.icree.org/> Contact person : Lynne Lui,

Ms. Publication : All accepted papers must be written in English and will be published into conference proceedings of ICPEES 2017, which will be published by IEEE and indexed by EiCompendex. Organized by : Energy Committees of ICREE. Deadline for abstracts/ proposals : 30th July 2017. Check the event website for more details.

8 to 11 Nov. : 7th Asian Mining Congress and International Mining Exhibition. Venue : International Conference at Hotel Westin, Rajarhat, Kolkata and Exhibition at ECO Park, New town, Rajarhat, Kolkata. Theme of the Congress : International Cooperation in Innovative Technology for Growth of Mineral Industry. Organiser : Mining, Geological and Metallurgical Institute of India, Kolkata. The Congress will provide a forum for promotion and support of techno-scientific cooperation towards national and international progress in the areas of mineral production, in addition to the development of new opportunities of sustainable business that will benefit both Asian and world communities. contact: Shri Prasanta Roy, Hony. Secretary, MGMI. Check the event website : www.asianminingcongress.com for details.

21 to 23 Nov. 2017 : 7th International Mali Mining and Petroleum Conference & Exhibition (JMP). Venue : Bamako, Mali. Website : <http://ametrade.org/jmp/> Contact person : Alessandra Linoci. The 7th International Mali Mining and Petroleum Conference & Exhibition (JMP) is set to take place in Bamako, Mali from the 21 – 23 November 2017, bringing together delegates and speakers from all over the world. Organized by : AME Trade Ltd. Check the event website for more details.

FEBRUARY 2018

7to 9 Feb. : International Seminar on "Exploration of Oil, Gas, Coal Minerals and Ground Water :

Modern Techniques and Appliances'. Organiser: ISM Alumni Association. Venue : Kolkata. Contact : Dr Ajoy Kumar Moitra (Convener), ismaa.kolkata@gmail.com and / or akmoitra@gmail.com Interested persons may kindly contact.

APRIL 2018

25 to 26 April : 6th Edition of the Mozambique Mining, Oil & Gas and Energy Conference and Exhibition (MMEC 2018). Venue : Maputo, Mozambique. Event MMEC 2018 will take place at Joaquim Chissano Conference Centre, Maputo. Website : <http://ametrade.org/mozmec/> Organized by : AME Trade Ltd. Check the event website for more details.

JUNE 2018

11 to 13 June : Biohydrometallurgy '18 Conference. Windhoek, Namibia, Website

: <http://www.min-eng.com/biohydromet18/>
Contact person : Dr Barry Wills. 9th Int Symp on Biohydrometallurgy will focus on the latest developments in the field of biohydrometallurgy : the development, optimisation and application of integrated biomining process operations for mineral ores, including low grade and complex...
Organized by : MEI Check the event website for more details.

14 to 15 June : Sustainable Minerals '18. Conference. Windhoek, Namibia. Website : <http://www.min-eng.com/sustainableminerals18/>
Contact person : Dr Barry Wills. The 5th Int Symp on Sustainable Minerals '18 is organised by MEI in consultation with Prof Markus Reuter. The rapid growth of the world economy is straining the sustainable use of the Earth's natural resources due to modern society's
Organized by : MEI. Check the event website for more details.□

(Please note : We aim to provide correct and reliable information about upcoming events, but cannot accept responsibility for the text of announcements or the bona fides of event organizers. Please feel free to contact us if you notice incorrect or misleading information and we will attempt to correct it.)

NEWS UPDATE

India pushes coal miners, power producers to roll out renewable energy projects

30th June 2017 : Kolkata – Overlooking apparent contradictions, India is pushing government-owned mining companies, including coal, thermal power producers and mineral processors to commit to more renewable energy projects.

“It is a little bit of a contradiction, but I have to keep the coal industry going while ensuring large scale outreach on renewables,” junior Minister with independent charge of power, coal, renewable energy and mines, Piyush Goyal, said in a statement. Taking their cue, several government-owned companies in minerals and metals and thermal power generation have begun announcing megaprojects for solar and wind power generation and making matching provisions in their capital outlay planning. Coal India Limited (CIL), the world’s largest producer of coal, would add 1 GW of renewable energy generation capacity within the next year and target a total renewal generation capacity of 10 GW, although no timeframe has been set for achieving the target, a company official said.

NLC Limited, which produces an estimated 30-million tons a year of lignite and has pithead power plants of 3240 MW, has announced plans to set up solar power plants with a capacity of 4000 MW over the next five years as part of the government’s National Solar Mission.

The country’s largest integrated bauxite miner and aluminium smelter, National Aluminium Company, also announced last month that it would venture into renewable energy, starting with a 150 MW wind and solar power plant in the eastern Indian coastal province of Odisha.

As per Renewable Energy Ministry vision document, India has set a target of achieving 100 GW of grid connected solar power by 2030 with phased targets laid down for each subsequent target ranging between 15 000 MW in 2017/18 and going up to 17 500 MW by 2021/22. (Source : miningweekly.com)

Steel Ministry seeks 12 coal washeries from Coal India

30th June 2017 : Kolkata : At the behest of India’s Steel Ministry, Coal India Limited (CIL) has agreed to set up 12 coking coal washeries to augment supplies to domestic steel mills. In view of the new National Steel Policy, which envisages ramping up India’s steel production to 300-million tons a year by 2030, the Steel Ministry had prodded its counterparts in the Coal Ministry to push CIL to take “quick decisions” on setting up the washeries. It is estimated that setting up more washeries will reduce India’s import dependency of coking coal by at least 25% to 30%, a Steel Ministry official said, adding that the CIL board would decide on investment, location and capacity details.

At the same time, the Coal Ministry has made it mandatory for bidders at the forthcoming auction of six coking coal blocks to set up washeries once investors are successful in securing the blocks through competitive bidding, the official said.

The six coking coal blocks will be put up for auction, as already announced for captive consumption of steel sector. However, the bid document will stipulate that all successful bidders will have to set up coal washery units as no ‘unwashed’ coal would be permitted to be used by their respective end-use plants, the official said.

It was also pointed out that on successfully securing a coking coal block and setting up a linked coal washery, it will also be mandatory for the mine operators to use washery rejects in their own captive power plants and only surplus rejects can be sold exclusively to CIL. CIL is in the process of setting up 15 new washeries and once operationalised, these will have an aggregate capacity of 112- million tons a year. (Source: miningweekly.com)

ONGC gets shale go-ahead

New Delhi, June 27 : State-owned explorer ONGC Ltd has got an environmental clearance to drill five wells for shale gas and oil in the Krishna-Godavari (KG) basin at an estimated cost of Rs 217 crore. ONGC had proposed further exploration of shale gas and oil in the KG basin and was examined by the environment ministry. According to the proposal, ONGC plans to drill wells in the onland blocks in West Godavari, Bantumilli extension, Suryaraopeta, Mahadevapatnam and Mandapeta in Krishna, West Godavari and East Godavari districts to assess the potential of shale. The project is estimated to cost Rs 217 crore. About 5-6 acres of land to drill each well will be required and the duration of drilling 90-120 days per well. All these wells will be drilled with water-base mud only, it added. The exploratory wells are drilled to assess the presence of shale gas, which also provide leads for initiating further exploration programmes. The exploratory efforts so far have led to the discovery of 65 small-to-medium sized hydrocarbon fields with about 356 million tonnes (oil and oil equivalent gas) of initial in-place on-land reserves. Since the KG basin holds significant promise for additional reserve accretion, the petroleum ministry is keen to continue the exploratory activity. At present, over 78 per cent of India's oil requirements are being met through imports. (Source : The Telegraph)

Vedanta seeks to quadruple Zambia copper output over three years

Johannesburg, June 26, 2017 : Vedanta Resources plans to quadruple its Zambian copper output over the next three years, the local unit's chief executive officer said, signalling a more ambitious expansion in Africa's second-biggest producer of the metal. Most of the increase will come from Konkola Copper Mines' (KCM) flagship operation in Chililabombwe, near the Democratic Republic of Congo border, where the unit is seeking to triple output in three years, Steven Din said Thursday in an interview in Lusaka, Zambia's capital. The company is investing \$1-billion in projects to achieve the increase. At the Konkola mine, the company produced 49 000 tons in the year that ended March 2016. "We are working on the design to be able to take the Konkola underground mine up from where it is today to about three times that," Din said. "Vedanta has already invested just over \$3-billion. Our intention is, with some more investment, to get those production levels up."

Vedanta is now targeting raising overall production to 400,000 tons within three years, an amount it said in April could take as many as seven years to reach. The company has restarted operations at its Nchanga mine that halted in November 2015 after copper prices plunged. KCM also plans to at least double output over 12 to 18 months at its tailings leach plant that extracts copper from old waste dumps, Din said. Zambia is Africa's biggest copper producer after the Democratic Republic of Congo. (Mining weekly)

Non-coal blocks auction : Mines ministry plans bids for FY 18

June 22, 2017 : Auction of non-coal mineral blocks is set to gain momentum. The mines ministry is planning to auction around 100 blocks in the current fiscal, compared with a total

of 23 till the end of March 2017 since the Mines and Minerals (Development & Regulation) Act was amended in January 2015 to pave the way for auctioning of non-coal mines. The auction of 100 blocks could attract bids worth Rs1 lakh crore, according to a preliminary estimate. Mineral-rich states have auctioned four blocks in the current fiscal so far. The auctioning of 100 blocks proposed in 2017-18 would not only help in increasing production of natural resources, it will also help generate higher revenues for the government. The 23 blocks auctioned off so far had fetched bids worth Rs73,359 crore and the revenue to the state governments by way of royalty, DMF and NMET are estimated to be Rs 1,19,032 crore over a 50-year lease period. "The entire allocation system has changed now. Now, the government has to bring up the blocks to a certain level of geological knowledge and then bid them out, reducing the risk for the bidder. It takes two-three years to develop the geological knowledge," mines secretary Arun Kumar told FE in an interview. While auctioning has brought transparency in the allotment process, MMDR is silent on a state's role in land acquisition. The Centre has also advised the states to keep the concession area adequate for the proposed mining area. Market factors such as setting reasonable reserve price are also an extremely critical factor for successful auctioning. Apart from the demand-supply scenario, overall financial health of the industry and other macro-economic factors should also be considered while taking up mineral blocks for auction. (Source: www.financialexpress.com/)

India's Rs 10k-crore plan on deep ocean mining, research

June 21, 2017 : India is readying a Rs 10,000-crore plan to intensify its deep ocean research and mining programme as research vessels from China and Taiwan continue to frequent the strategically important Indian Ocean. The mining would be for potato-shaped polymetallic

nodules that carry valuable metals like cobalt, nickel, copper, manganese and zinc. One of the thrust areas in the programme is to develop a deep sea mining submersible, which can dive 4-6 km into the ocean for harvesting these nodules. "We want a deep sea mining crawler that can take out the nodules, crush them on the spot, mix them with water and pump it back to the surface. Since we don't have such technology, we are in talks with Japan," Ministry of Earth Sciences Secretary M Rajeevan told DH. This is the second piece of real estate in the Indian Ocean where India invested its resources. In 1987, the then department of ocean development had acquired exploration and research rights for a 75,000 sq km area in the central Indian Ocean basin to look for polymetallic nodules.

"In these years, we have been able to properly identify the area, carry out necessary environmental checks and develop some of the technologies. But we still lack deep sea mining expertise. A brainstorming session is planned here on July 10," he said.

The Ministry of Earth Sciences currently owns five research vessels, two of which are old and need to be replaced at a cost of Rs 600 crore. (Source : <http://www.deccanherald.com/>)

Minor Mineral Concession Rules amended

Shillong, Jun 16, 2017 : The State Cabinet has brought minor amendments to the Minor Mineral Concession Rules. Speaking to media persons after the Cabinet meeting on Thursday, Chief Minister Mukul Sangma informed that Rule 6 and Rule 24 of the Minor Mineral Concession Rules have been amended so that all proposals of the miners for mining of minerals are examined and scrutinized in the perspective of Meghalaya Transfer of Regulation Act, 1971. Meanwhile, the Cabinet also made an amendment to the Meghalaya Human Rights Commission Salary

and Allowance and other terms and conditions of the services of Members Rules. Under the amendment, the Government added a word "Allowance" under the rules which did not exist earlier. (Source: <http://www.theshillongtimes.com/>)

Fire in NLC India mine destroys a few lakh tonnes of lignite

Cuddalore, June 13, 2017 : A fire destroyed a few lakh tonnes of lignite stored in a mine at the NLC India Limited at Neyveli in Cuddalore district of Tamil Nadu on Tuesday. NLC India officials said the company had stored tonnes of lignite mined from miniature mine I A, which was meant to supply fuel for a private power plant at Omangalam near the Neyveli township. The lignite caught fire due to intense heat on Monday afternoon despite precautionary measures undertaken by the company. There is no causality and major loss to properties. "Generally the incubation period to store lignite is 45 days. The miniature mine I A was established to supply fuel to the Omangalam private power plant. We have signed a fuel supply agreement with the private firm. The firm failed to transport lignite from the mine leading to accumulation of lignite in the mine. Lignite ignites spontaneously in intense heat. We have adequate precautionary measures like using water sprinklers to keep the fuel wet. Despite our efforts fire broke out," said a NLC India Limited official. The official rubbished claims that the fire might affect the operations of the company besides polluting the entire region with hazardous chemicals. "These types of fire accident do occur frequently in mines considering the combustible nature of Lignite. The fire is near a miniature mine located far away from the thermal plants," he said. The company supplies 1.7 million tonnes per annum to the private firm. "We have mined adequate lignite from the miniature mine for supplying to the private firm and hence we stopped mining

operations until the private firm cleared the stored lignite," said the official. (Source : <http://timesofindia.indiatimes.com/>)

Surda copper mine disruption impacts HCL

June 11, 2017 : The mining disruption at the Surda copper mine will affect the state owned the Hindustan Copper for some time. The India Resources Ltd (IRL), the mining contractor, terminated the contract to operate the mine with effect from June 2. "We have identified and working for an alternative contractor for operating the mine, but we are unable to give any time frame by when the new operator will be in place," a HCL official told PTI. Moreover, the cost of production for HCL was expected to rise, he said. A key reason for termination of mining contract was being unable to receive reimbursement of 40 per cent increase in statutory wages, made effective by government since January 2017, from the HCL triggering strikes by workers, IRL claimed. HCL contested the claim under the terms of contract. Both had mutually agreed to extend the contract for nine months from April, 2017, they said. HCL said measures to restore normal production from the mines by deploying a new contractor was likely to take some time. The production activities of Surda mine are currently affected and in May the production dipped to just 25 MT, one tenth of normal production, officials said. (Source: <http://www.financialexpress.com/>)

Coal India to close 37 mines

Kolkata, June 10 : Public sector miner Coal India has decided to close 37 unviable underground coal mines and re-deploy manpower from the sites to cut losses suffered on lifting coal from these mines. At a review meeting with the coal major and its subsidiaries, the coal ministry has found out that a sizeable number of mines are unable to recover the salary of workers. Accordingly the miner was asked to

conduct a detailed study of such mines and report the action taken regarding them. "In view of the above, an action plan has been prepared by subsidiaries in which 37 unviable UG (underground) mines have been envisaged to be closed in 2017-18," CIL said in a filing to the Bombay Stock Exchange. "The identified surplus manpower from these mines would be gainfully redeployed in nearby mine areas to reduce further loss in these mines," it said. According to a disclosure to the BSE in April, Coal India had said that of 413 mines it owns, 176 are open cast mines, 207 are underground mines and 30 are mixed mines. However, bulk of Coal India's production comes from open cast mines. Industry sources said the exercise to cut down production from the identified mines could yield savings of around Rs 800 crores for the miner. Coal India's provisional production in 2016-17 was 554.13 million tonnes against a target of 598.61 million tonnes and recording a growth rate of 2.9 per cent. Of this underground mining contributed to around 31 million tonnes. Coal India has set a production target of 661 million tonnes for 2017-18 from a combination of its active and future projects. (Source : The Telegraph)

Uranium mining to move out of Gujanal to uninhabited areas

Belagavi, June 09, 2017 : Uranium mining is being moved out of Gujanal village in Gokak taluk of Belagavi district after complaints from villagers that deep drilling was making borewell water smell foul. Scientists from the central Atomic Minerals Directorate for Exploration and Research (AMDER) have confirmed to The Hindu that drilling would be moved out of inhabited areas in the village. Officers on site have clarified, however, that it is not a case of leakage of radioactive material and there was no need for alarm. "We are shifting, and this has been communicated to the district administration," an officer said. The directorate

has been doing a pilot study of uranium mining in Gujanal and two other villages in Belagavi district. While mining in Deshnoor and Suladhral are far from inhabited areas, the drilling points in Gujanal are within settlements. Gujanal residents have been complaining that the mining was polluting groundwater. "Water in around five wells in the village has a foul smell. We are unable to drink it or use it for washing or bathing," they said, in their complaint to the government. They suspect that coolant and other chemicals used in drilling have seeped into the water. Balesh Mugalihal, a resident, said some families who had consumed the water were suffering from acidity and headache. Maruti Ganachari, another resident, said : "We are not opposed to uranium mining as long as the chemicals do not mix with drinking water." B.G. Prakash, senior scientist in charge of the operations in the village, has assured villagers that mining sites will be moved out of the inhabited areas. (Source : <http://www.thehindu.com/>)

Cheaper solar in India prompts rethink for coal projects

Bloomberg, Jun. 2, 2017 : India's coal-power plant developers are growing more pessimistic about their projects after a plunge in the cost of electricity from solar panels improved the economics of renewable energy. After a string of federal auctions, solar is suddenly the cheapest source of electricity in India. That's darkening the outlook for the coal-fired power industry as projects struggle to find customers or face cancellation amid a glut of capacity.

In May, the Business Standard reported that the state of Gujarat scrapped a so-called ultra-mega power project. State-run NTPC Ltd., India's largest power producer, along with Rattan India Power Ltd. is considering installing solar panels over land initially intended for thermal projects. NTPC said in February it's aiming to have 30

percent of its capacity come from non-fossil fuel by 2032. The government of the sunny state of Rajasthan expects more conventional power to be replaced by clean energy as higher renewable purchase targets are fulfilled. Solar is now as much as 50 percent cheaper than new coal power, according to solar research firm Bridge to India. The levelized cost of energy from a new super-critical coal plant in India stands at 3,541 rupees a megawatt-hour, or 3.54 rupees a kilowatt-hour, meaning it's above the 2.44 rupees a kilowatt-hour achieved at the recent auction, according to BNEF. The cost of new emissions rules increases the cost of new coal plants further to 3,890 rupees a megawatt-hour, or 3.9 rupees a kilowatt-hour, BNEF said. Even so, renewables are expanding quickly in India. Solar capacity has surged fourfold since December 2014 to about 12 gigawatts, while wind farms now provide 32 gigawatts, up from 22.5 gigawatts over the same period. Modi is seeking an additional 88 gigawatts of solar and 28 gigawatts more of wind by 2022. And those projects are crowding coal out of the power market. "When the renewable generation is available, to that extent the thermal generation goes off the grid," Ravindra Kumar Verma, chairman of India's Central Electricity Authority said in an interview in New Delhi, adding that the country doesn't need any more coal-fired capacity beyond what exists or is already under construction. (Source : mining.com)

KIOCL to revive iron ore mining, to invest Rs. 1,500 crore in new plant

June 01, 2017 : State-owned KIOCL will revive mining after a decade in Karnataka, after the

state granted the company a lease of over 474 hectares at Devadaru hills in Ballari. KIOCL had suspended mining in the eco-sensitive Western Ghats following a Supreme Court directive in 2006. "The company has already prepared an action plan and initiated the process for obtaining the necessary statutory clearances," said Malay Chatterjee, CMD of KIOCL on Wednesday. Once approvals are given, it would invest Rs 1,500 crore in a pellet plant and also a unit to enrich iron ore from the mines. After suspension of mining, KIOCL had shifted to operating 3.5 million tonne per annum pellet plant in Mangaluru. Last year, it produced 1.46 million tonnes, utilising half its capacity, as against almost nil production in the previous year. Under the Make-In-India programme, International agencies have already implemented pilot projects by bringing high grade iron ore from South America, Iran and other parts of the world and utilising KIOCL's facility, have taken away pellets facilitating better utilisation of its plant capacity and profitability utilising its manpower. The company's blast furnace Unit having a capacity of 216,000 tonnes of pig iron which was put under suspension since 2009 has been taken for repair and the Unit is ready for operation for producing foundry grade pig iron adding towards its profitability in the coming financial year. The firm earned a profit of Rs. 47.93 crore in FY 17 as against a loss of Rs. 80.15 crore the orevious year. Revenues grew 353 per cent to Rs. 929.36 crore from Rs. 205.57 crore in the previous fiscal.□

(Source : Newsonprojects.com)

ESSENTIAL DIMENSIONS OF GEOSTATISTICS IN MINERAL INDUSTRY : A PERSPECTIVE FROM AN APPLIED GEOSTATISTICIAN AND MINERAL RESOURCE-RESERVE CLASSIFICATION SYSTEMS

Dr BC Sarkar*

ABSTRACT

The question of how to estimate the variable under study at an un-sampled location given sample observations at nearby locations aims at calculating a value, termed estimate, at the un-sampled location. Geostatistics provide an improved means of spatial interpolation and uncertainty assessment. Estimation is possible due to spatial correlation if they are measured close by. If the unknown outcome at the un-sampled location were dependent on the known sample value at another location, then that sample value necessarily carries information about the unknown. In statistical sciences, uncertainty is quantified through a statistical distribution, describing the frequencies of outcomes one expects at that location. Over the last twelve years considerable progress has been made towards worldwide standardization of requirements for estimation and reporting of exploration results, mineral resources and mineral reserves. This paper provides some of the highlights of the progress.

Introduction

Geostatistics originated in South Africa during 1960s from the application of two basic classical statistical procedures i.e., frequency distribution modelling and correlation analyses. All subsequent developments in geostatistics have not eliminated the need for a consistent application of these two and other classical procedures. Geostatistics provide improved estimates by involving the definition of geological domains, the statistical and geostatistical parameters of sample data, and the application of an optimal imaging technique for adequate mineral inventory.

Necessity of using Geostatistics

The techniques are reasonable to demonstrate that almost any mineral deposit, simple or complex in terms of geology, which has a definable spatial continuity, would be amenable to geostatistical evaluation given that it has been geologically domained and suitably sampled. The most useful tool, at the exploration stage, is the semi-variogram that quantifies the range and direction of grade continuity and lends support to geological interpretation. The relationship between variability and block sizes, which is quantified by the semi-variogram, allows one to interpret the choice of block size for kriging.

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Categorization of mineral resources/reserves is decided by the range of influence of the semi-variogram and also the size of the block chosen for kriging. Despite its wide dissemination and growing acceptance in mineral deposit evaluation for reserve modelling, mine planning and grade control over the years, there has been some reticence in its use. The foremost reasons that account for the reticence include: (i) considerable increase in the assumptions of underlying theories; (ii) growing complexity of the mathematical treatment of these theories; and (iii) less geological consideration in the estimation procedures. Geologically complex grade distributions within a deposit are often modelled without paying much attention to the deposit geology and controls of mineralization (Sarkar, 1988b). Much of the time is spent on collecting, coding, and storage of geological information of a deposit often at great expense, but at times, rarely incorporated in geostatistical modelling workflow. The reasons for this could be that either one is not very sure how to link a geological model to a geostatistical approach or a computer package in use is too unwieldy or inflexible to cope anything other than simple assay values per drill section.

Essential Dimensions

Whichever estimation method is employed, it must be chosen and applied within a strict framework of geological understanding. Geology should guide resource estimation, not resource estimation guiding the geology (Sarkar, 1988a). Geological interpretations are continually evolving components of the resource estimation process because new information is continually becoming available as exploration, evaluation and exploitation proceeds. If mineral resource estimation process is based on high-resolution data, whose interpretation is controlled by geology and statistics, then it has a good chance of being closer to the reality.

Geological Domaining

A domain represents a zone with reference to various geological controls that guide the formation of mineral deposits and style of mineralization. Domains should complement the deposit geology wherever possible, but where this is not achievable, some other form of domain concept needs to be imposed, like a grade zone concept defined by a cut-off grade that should bear some relation to the economics of a deposit under consideration. Distribution of economic mineral constituents in a mineral deposit depends upon mineralization phenomena, which in turn is governed by rock type, mineralogy, structure and genesis, among other geological controls within distinct domains of a mineral deposit. Identification of such geological domains aids in understanding of a statistical term 'Population'. When sampling is carried out, data pertaining to each geologically defined domains are considered to be from those many populations. Prior to any geostatistical data processing, an important step is to carryout 'Exploratory Data Analysis' through frequency plot, scatter plot and box plot to reveal data specifics (namely, presence of multiple populations, presence of outliers, presence of erroneous sample values and presence of missing data, among others, if any).

Semi-variography with respect to Geological Domains

Semi-variography carried out with respect to such individual geologically defined domains provide geostatistically tractable estimates. Generation of semi-variograms and their subsequent modelling should reveal the structure of spatial continuity of the data, and should confirm geostatistically any geological trends, if present. It is suggested to seek a geological explanation for principal directions revealed by a semi-variogram analysis. Often

such a step would reveal some subtle controls on mineralization not immediately evident in the geology. Volume-variance effect is becoming more readily acceptable in mineral industry. The volume-variance effect describes the impact of the volume of the samples on the grade distributions (Coombes, 1996). Fundamentally, smaller sample volume is associated with greater variability between samples and greater is the variance. This volume-variance effect demonstrates itself in the histogram as a greater spread in grades for smaller sample volumes. Semi-variogram summarises the spatial breakdown of the variance. In calculating spatial variability, it is imperious that the variability is not distorted by analysing the differences between sample grades which are based on different volumes. The input data should be composited to equal volumes prior to any semi-variography.

Critical Decisions on Block

Definition and modelling of semi-variogramsaid in deciding block size to be used in any block modelling techniques Modern geo-mining software has advanced that almost all of the major packages provide moderate to excellent tools for defining three-dimensional mineralized volume and for filling them with blocks. Key decisions at this stage include, (i) what should be the block size as compared to the data? (ii) what should the relative shapes of the blocks be in its three dimensions? (iii) how complex should the 3D block network be? and (iv) what should be the minimum and maximum numbers of samples to estimate a block and their relative positions with respect to the blocks to be estimated? All these should be decided with reference to the nature, style of mineralization, nature of host rock, sample grid spacing, proposed method of mining, proposed daily production target, use of such blocks to be evaluated, estimation technique employed,

an understanding of the computer package to be used, and ability of the computer package in use to provide all intermediate results for cross-validation, among others.

Essential Spotlights

A geostatistical modelling process must provide for close interaction between the geologist, the computer and the geo-mathematical estimation procedures in a way that the geologist retains control and has confidence in the final results. A clear understanding of the mineralization type and a thorough analysis of geological controls, which affect the distribution of mineralization grade hosted in a specific type on mineralizing environment, are essential prerequisites to the application of geostatistics. At times, it has been observed while carrying out kriging, negative weights are associated with the neighbouring sample values. This happens if estimates are made in where outlier has been included or due to screen effect. Whatever may be cause, the negative weights must be removed before the kriged results are accepted (Sinclair and Blackwell, 2002).

However, geostatistically evaluated estimates must undergo some post-processing before being accepted finally. It has often been observed that there exists a heavy bias towards advanced techniques often at the expense of neglecting some relevant data, elementary follow-up correlations and other basic statistical analyses. A proper assessment of the relative effects of conditional bias and the information effect is usually absent. A kriging technique which does not access enough data to eliminate conditional bias is suboptimum and does not use all available data to best advantage. Since kriging is associated with smoothing, two tests must be performed, namely test of conditional bias and correction for smoothing. On completion of these steps, block estimates are displayed, assessed visually and a comparison of block,

sample composite and individual sample values is then made for a reconciliation of the results. Only when reconciliation process is complete to the satisfaction of all concerned, the estimation of block values be accepted and used for follow-up stages for mine decisions. Globally, simulation is one method for correcting the smoothing effect of block kriging to yield unsmoothed tonnage-grade estimates and to reflect the basis on which selective decisions relative to any cut-off grade will finally be made.

Geostatistics thus provides new dimensions in exploration, characterization and evaluation of a mineral deposit, in which spatial correlation is the fundamental basis. It quantifies geological interpretation and reinforces it when used in estimation. Many case studies have highlighted the importance not only of understanding the geological processes but also of understanding the statistical and geostatistical features inherent in a deposit, which leads to a geologically meaningful, statistically simple and geostatistically stable mineral inventory. Geostatistics is a powerful tool, but it must be used with caution. There are many ways of

using geostatistics incorrectly, but if it is well-understood and properly applied, it can be of great benefit.

Mineral Resource – Reserve Classification

Classification of mineral resource / reserve is the process of arrangement with respect to degree of assurance or reliability. It enables mineral statistics to be communicated internationally – a necessity for market economy. Mineral Resources are sub-divided, in order of increasing geological knowledge and confidence, into Inferred, Indicated and Measured categories. The category to which a resource or reserve estimate is assigned depends on (i) the level of confidence in geological information available on a mineral deposit; (ii) The quantity and quality of data available on the deposit; (iii) the level of the technical and economic information that are generated about the deposit, and converting the data to information and interpretation of information into workable knowledge. Fig. 1 shows the general relationship between exploration results, mineral resources and ore reserves.

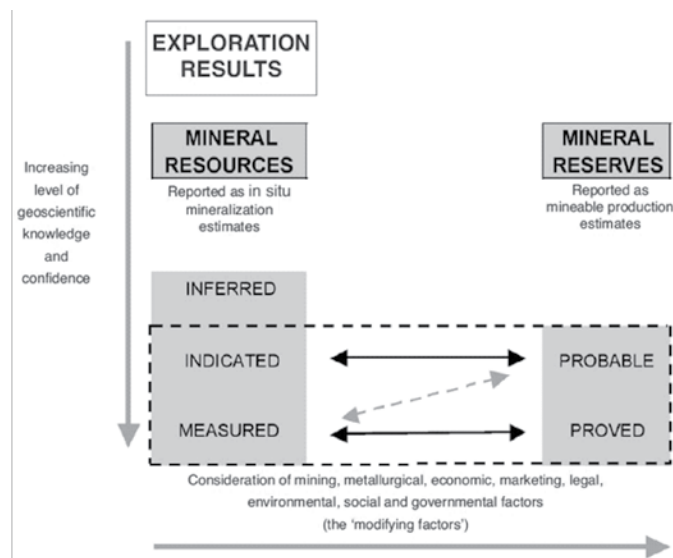


Fig. 1 General relationship between Exploration Results, Mineral Resources and Ore Reserves.

Exploration Results include data and information generated by exploration programmes that may be of use to investors. The Exploration Results may or may not be part of a formal declaration of Mineral Resources or Ore Reserves. The reporting of such information is common in the early stages of exploration when the quantity of data available is generally not sufficient to allow any reasonable estimates of Mineral Resources. A 'Mineral Resource' is a concentration or occurrence of material of intrinsic economic interest in or on the Earth's crust in such form, quality and quantity that there are reasonable prospects for eventual economic extraction. Mineral Resources are sub-divided, in order of increasing geological confidence, into Inferred, Indicated and Measured categories. An 'Inferred Mineral Resource' is that part of a Mineral Resource for which quantity and grade or quality can be estimated on the basis of geological evidence and limited sampling and reasonably assumed, but not verified, geological and grade continuity. The estimate is based on limited information and sampling gathered through appropriate techniques from locations such as outcrops, trenches, pits, workings and drill holes. An 'Indicated Mineral Resource' is that part of a Mineral Resource for which quantity, grade or quality, densities, shape and physical characteristics can be estimated with a level of confidence sufficient to allow the appropriate application of technical and economic parameters, to support mine planning and evaluation of the economic viability of the deposit. The estimate is based on detailed and reliable exploration and testing information gathered through appropriate techniques from locations such as outcrops, trenches, pits, workings and drill holes that are spaced closely enough for geological and grade continuity to be reasonably assumed. A 'Measured Mineral Resource' is that part of a Mineral Resource for which quantity, grade or quality, densities, shape, and physical

characteristics are so well established that they can be estimated with confidence sufficient to allow the appropriate application of technical and economic parameters, to support production planning and evaluation of the economic viability of the deposit. The estimate is based on detailed and reliable exploration, sampling and testing information gathered through appropriate techniques from locations such as outcrops, trenches, pits, workings and drill holes that are spaced closely enough to confirm both geological and grade continuity.

A 'Probable Mineral Reserve' is the economically mineable part of an Indicated and, in some cases, a Measured Mineral Resource demonstrated by at least a Preliminary Feasibility Study. This Study must include adequate information on mining, processing, metallurgical, economic, and other relevant factors that demonstrate, at the time of reporting, that economic extraction can be justified. A 'Proved Mineral Reserve' is the economically mineable part of a Measured Mineral Resource demonstrated by at least a Preliminary Feasibility Study. This study must include adequate information on mining, processing, metallurgical, economic, and other relevant factors that demonstrate, at the time of reporting, that economic extraction is justified.

Modern Classification and Reporting Systems

Acquisition of equity funding, through the issue of company shares, is based on documentation, which includes reports on mineral reserves and resources. If such reporting is not transparent, consistent nor communicated clearly then there is an opportunity for misrepresentation and even fraud as happened on October 1, 1969 and in 1997.

On October 1, 1969, Poseidon directors issued a historic report to the Adelaide Stock Exchange before the start of trading stating that the assays received from Windarra nickel prospect, West

Australia, showed a value of 3.56% of NiS. But Poseidon had no basis on which to make such a calculation at the time and the actual assay of the core turned out to be substantially lower, although still of ore grade. But their purpose was served—temporarily at least—inasmuch as the value of the stock of the company shot up as soon as the stock market opened that morning. This prompted the Melbourne Stock Exchange and the Australian Government to take initiative and as a result Joint Ore Reserve Committee or JORC, an advisory body, was formed in 1971 with representation from Australasian Institute of Mining and Metallurgy, Minerals Council of Australia, Australian Institute of Geoscientists, Australian Stock Exchange and Securities Institute of Australia. The JORC took 18 years to formulate a standard ore reserve classification system. But once it came in 1989, it became the mother of many classification systems in a number of countries as well as that of the United Nations Economic Commission for Europe (UNECE) later on.

The second scandal known as Bre-X scandal—a more serious one—broke out in 1997. Bre-X was a Canadian company which explored in Busang gold prospect in Borneo, Indonesia in 1994 and reported a large high grade minable reserve of gold (95 million ounces of metal with a low operating cost of only US\$ 96/oz) resulting in a boom in its rating in the stock market. But in 1997 it turned out to be a fraud after revelations that the geologist concerned mixed specks of gold to inflate the assay value, with the result that the value of its stock crashed, and with scores of litigations and claims lodged in the court, the company was eventually declared bankrupt. This has made life particularly hard for the junior exploration sector at a time when it has taken on a significant role in the generation of mineral resources for major mining companies. In this context, the codification system for exploration and mineral resource estimation formulated by

the JORC in Australia was strengthened and the initiatives that were taken in UK, South Africa, USA, Canada and by UNECE to codify proper systems, started being treated with a sense of urgency.

JORC Code (Australia)

JORC formulated a system of codes in 1989. According to its code :

- 1) Minimum standards are set for public reporting (in Australia & New Zealand) of exploration results, mineral resources and ore reserves.
- 2) Public reports must be based on work undertaken by a “competent person”.
- 3) The qualifications and type of experience required to be a “competent person” are specified.
- 4) Extensive guidelines are provided on the criteria to be considered when preparing reports on exploration results, mineral resources and ore reserves.
- 5) Procedure has been given to deal with breaches of the Code.
- 6) Mandatory system for classification of tonnage/grade estimates into categories of Measured, Indicated and Inferred resources and Proved and Probable reserves which are defined according to geological confidence and technical/economic considerations are provided.

The main principles governing the operation and application of the Code are transparency, materiality and competence. Transparency requires that the reader of a public report be provided with sufficient, clear and unambiguous information to understand and is not misled. Materiality requires that a public report contains all the information regarding the mineralization being reported which investors and their

professional advisors would reasonably require and reasonably expect for the purpose of making a reasoned and balanced judgement. Competence requires that the public report be based on the work of a suitably qualified, responsible and experienced person who is subject to an enforceable professional Code of Ethics or Rules of Conduct.

The JORC Code is the mother of a few codes recognized by stock exchanges of South Africa (South African Mineral Resource Committee or SAMREC), USA (Society for Mining, Metallurgy and Exploration or SME), Canada (Canadian Institute of Mining, Metallurgy and Petroleum or CIM) and UK (Institute of Materials, Minerals & Mining or IMMM). However, in case of the latter, the definition of ‘competent person’ is more stringent than in JORC Code in as much as the recognized professional body has been further qualified to be “with enforceable rules of conduct”.

UNFC system (1999)

The UNFC system uses a numerical codification system for the different geological and technical assessment stages and the resulting economic viability which has proved useful in simplifying comparison of different coal and other solid mineral commodities classifications. The UNFC system is a three-dimensional system making a clear distinction between the economic viability and the technical feasibility unlike other classification systems in usage which are two-dimensional, combining these two into a single dimension — techno-economics. It has further advantage of providing a short, unambiguous identification of the reserve/resource classes, which facilitates computer processing of data as well as exchange of information. Both English terms and numerical codes are used to depict different categories and the latter is particularly effective in overcoming the language barriers and hence is easily understandable across the

world (this understanding assumes particular importance in the globalized economy with transnational investments becoming common phenomena). Besides, the UNFC system, being three-dimensional, is precise and market-oriented, and hence it is helpful in making investment decision for exploration and mining of mineral deposits.

The numerical codification comprises 3 digits representing Economic Viability (E), Feasibility Assessment (F), and Geological Assessment (G). The Economic Viability (E) categories refer to quantities economically extractable at present, quantities possibly extractable in future, and quantities with prospects of being economically extractable not yet defined. The Feasibility Assessment (F) refers to engineering, economic, legal, environmental and other relevant appraisal. Geological Assessment (G) refers to geological, geophysical, geochemical, chemical, mineralogical, and other relevant investigations. These 3 digits are quoted in the order “EFG”, firstly because alphabetical order is easy to memorize, and secondly because the first digit refers to the economic viability, which is of decisive interest to both industry and investors. Numbers are used to designate the degree of Economic Viability and the different stages of Feasibility Assessment and Geological Assessment. The first and the lowest number refer to the highest degree of Economic Viability, Feasibility Assessment and Geological Assessment.

SAMREC (South African Code for Reporting of Mineral Resources and Mineral Reserves)

In line with the JORC Code and internationally accepted standards, the main principles governing the operation and application of the SAMREC Code are transparency, materiality and competence. ‘Transparency’ requires that the reader of a Public Report is provided

with sufficient information, the presentation of which is clear and unambiguous, to understand the report and is not misled. 'Materiality' requires that a Public Report contains all the relevant information which investors and their professional advisers would reasonably require, and reasonably expect to find in the report, for the purpose of making a reasoned and balanced judgement regarding the mineralisation being reported. 'Competence' requires that the Public Report be based on work that is the responsibility of a suitably qualified and experienced person who is subject to an enforceable professional code of ethics. Other main aspects of the SAMREC Code are as follows :

- (i) Mineral Resources are tonnages and grades of the in-situ ore estimated over a realistic stoping width while Mineral Reserves are estimates of grades and tonnages of the material reporting to the mills (Run-of-Mine) and inclusive of all relevant factors such as Mine Call Factor, metallurgical recovery factors etc.
- (ii) Economic viability becomes the fundamental parameter in the SAMREC Code. Mineral Reserves are the economically mineable portions of a deposit, for which extraction is reasonably justified at the time of reporting. Mineral Resources must have reasonable and realistic prospects for eventual economic extraction. Also, portions of a deposit that do not have reasonable and realistic prospects for eventual economic extraction must be excluded from Mineral Resources. This implies that a minimum but realistic cut-off grade must be applied when estimating Mineral Resources.
- (iii) SAMREC introduces the concept of 'Modifying Factors' in line with the Denver Accord. These are considerations of mining, metallurgical, economic, marketing, legal, environmental, social and governmental factors, which have to be taken into account and be fully satisfied when converting Mineral Resources into Mineral Reserves.
- (iv) The classification of Mineral Resources and Mineral Reserves is primarily based on the level of confidence in the estimates.
- (v) Mineral Resources can be reported either inclusive of Mineral Reserves or exclusive of Mineral Reserves. The Code is not prescriptive on the matter. However, in the case where Mineral Resources are reported inclusive of Mineral Reserves, the relevant details (such as grades and tonnages) of the Mineral Resources which have not been modified to produce Mineral Reserves for economic or other reasons must be included in the report.
- (vi) Public Reports on Exploration Results, Mineral Resources and Mineral Reserves, must be based on and fairly reflect the report of the Competent Person (CP) and shall require his written approval for the relevant parts of his report included in the document. In addition, the Public Report shall disclose the CP's qualifications, professional affiliations and relevant experience.
- (vii) The requirements in order to qualify as a CP have been formally defined for the first time in South Africa. A CP is such on his own recognisance but he must be clearly satisfied in his own mind that he could face his peers and demonstrate competence in the commodity, type of deposit and situation under consideration. In addition, the Code also requires that he belongs to a statutory organisation recognised by SAMREC. The main reason for this is that such organisation would be empowered to discipline members who have acted contrary to its code of ethics. In any event, a CP is legally accountable for the relevant

parts of a Public Report for which he has signed responsibility.

- (viii) The accreditation of foreign professionals as a CPs would be via an organisation recognised by SAMREC.

CRIRSCO (Committee for Mineral Reserves International Reporting Standards)

CRIRSCO aims to contribute to maintaining that trust by promoting high standards of reporting of mineral deposit estimates (Mineral Resources and Mineral Reserves) and of exploration progress (Exploration Results). CRIRSCO style standards is for the public reporting of Exploration Results, Mineral Resources and Mineral Reserves. They are therefore firmly targeted at investors in the mining industry including financial institutions who have an interest in determining the future health and prospects of mining companies. The fact that many of the standards are linked to regulatory bodies whose role is to protect such investors is a further indication of the priorities that these standards set out to achieve. In fact it would be hugely beneficial if governments adopted the same terminology as the mining industry when describing Mineral Reserves and Mineral Resources. In CRIRSCO-style codes, reporting standards are recognised and adopted world-wide for market-related reporting and financial investment.

Scope of CRIRSCO includes all solid minerals (metals, gemstones, bulk commodities, aggregates, industrial minerals, energy minerals such as coal and uranium) with aim of Promoting International Best Practice in the Public Reporting of Mineral Exploration Results, Mineral Resources and Mineral Reserves. Key Features of CRIRSCO reporting standards include :

- (i) CRISCO standards quantify, qualify, and categorize mineral assets on the basis of the data, models and criteria;

- (ii) Reliable mineral resources/reserves inventory to underpin mineral estimates used by mining companies to attract investment and promote exploration and development activity;
- (iii) Public Reports are prepared by or under the supervision of a Competent Person who signs off and takes personal responsibility;
- (iv) Makes a clear distinction between resources and reserves; and
- (v) It excludes “uneconomic” and “undiscovered” materials.

The CRIRSCO family of codes and standards currently includes :

- (i) Australasia – The Joint Ore Reserves Committee (JORC)
- (ii) Canada – Canadian Institute of Mining (CIM) Code – NI 43-101
- (iii) Chile – ComisionMinera de Chile (ComisionMinera)
- (iv) Europe – Pan-European Regional Council (PERC)
- (v) Russia – The Russian National Code (the “NAEN Code”)
- (vi) South Africa – South African Code for Mineral Resources and Mineral Reserves (SAMREC)
- (vii) USA – The Society for Mining Metallurgy and Exploration (SME).

Concluding Remarks

Confidence level associated with estimates is of utmost significance throughout and should be able to govern the classification principles of mineral resources and reserves. While other techniques are practised, those are mostly based on subjective considerations or on judgmental understanding. Geostatistics

provides an improved basis for estimates with minimum error variance, free of conditional biases and at the same time, can provide assessments of the confidence levels for the estimates. Besides geostatistical analyses, geological considerations constitute essential prerequisites to deliver appropriate importance in decisions concerning the classification of resources and reserves.

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If you love life, don't waste time,
for time is what life is made up of : Bruce Lee

EMERGENCY MESSAGING IN UNDERGROUND COAL MINING FOR EMERGENCY EVACUATION & GENERAL MESSAGING

The safety of personnel during an emergency depends on the ability to easily and quickly communicate evacuation instructions. At the time of an incident, personnel may be located in an area underground where communications or power infrastructure has been cut-off or may not exist at all. This leaves personnel either unaware of impending danger or without clear instructions on what to do and which evacuation route to use.

MST (Mine Site Technologies) has found out a solution to this

MST's through-the-earth (TTE) communication uses an ultra-low frequency transmission that propagates through rock strata to provide text messages to personnel regardless of their location underground. The text message receiver known as the PED (Personal Emergency Device) integrated into the miners cap lamp battery to ensure easy adoption.

The ability to send text messages to a person wherever he is located provides a very powerful emergency warning capability. Not only can a person be alerted to an emergency, but be given specific instructions to best deal with the emergency, such as evacuation route to take, location of incident, etc.

Often installed as the primary evacuation warning system, it is important to note that PED is also used as a very effective day to day management communication system.

The ability to issue work instructions for the deployment of personnel and equipment and get to the right person, or group of people, wherever they are in the mine offers significant productivity benefits. Additionally, by using the PED every shift, people are familiar with its operation and the system is constantly known to be in good working order.

MST has installed this solution in over 150 underground mines in Australia, USA, Canada, China, India, Mexico and Sweden.

The Integrated Communications Cap Lamp (ICCL) is a high quality miner's light using the Lithium-Ion technology. What sets the ICCL cap lamp apart from other mining lights is it is designed to incorporate a range of personal electronic & safety devices, such as :

The PED Text Receiver, RFID Tag, and Proximity Alert Device (PAD)

Combined with line of sight (LoS) based communication systems, PED provides a total communication solution to a mine's requirements, in both day to day use and in emergencies. For more on Emergency Messaging solutions, please see PED Brochure and ICCL Brochure.

For more information on Emergency Warning Systems contact :

<http://mstglobal.com/solutions/emergency-messaging/underground-coal-mining/>

THE WORLD'S WORST COAL MINING DISASTERS

While technological improvements and stricter safety regulations have reduced coal mining related deaths, accidents are still too common. China, which produces more than one-third of annual global coal output, accounts for more than two-thirds of mining deaths around the world each year. Mining Technology profiles major coal mine disasters around the world. Most of the coal mine disasters around the world were caused by gas and coal dust explosions

1. Benxihu Colliery Disaster (1942) - China

The Benxihu colliery disaster in China cost 1,549 lives and is believed to be the worst coal mining disaster ever. The tragedy occurred on 26 April 1942 in the Honkeiko coal mine, located near Benxi in the Liaoning province of China. The fatal explosion of the underground coal mine was caused by a mixture of gas and coal dust. The underground fire exploded out of the mine shaft entrance.

The ventilation system was shut off and the pit head was sealed by the mine operator to deprive the underground of oxygen. An electric fence was erected around the pit to obstruct the entry of miner's relatives.

The coal mine was forcefully operated by the Japanese until the end of World War II in 1945. The Soviet Union conducted an investigation of the mine accident, following the liberation of Liaoning province from the Japanese Army's control. Carbon monoxide poisoning due to the closure of the ventilation system was reported to have caused most of the deaths.

2. Courrieres Coal Mine Disaster (1906) - France

The Courrieres mine disaster in France, with a total death toll of 1,099, is the second deadliest coal mining disaster in history. The

coal mining catastrophe occurred on 10 March 1906 due to a massive explosion sparked by an underground fire in one of the pits of the Courrieres Colliery.

The fire was detected around 270m underground in the Cecil pit in afternoon the day before the explosion. The outlets of the pit were closed to starve the fire of oxygen.

The next morning a huge explosion emanated from the still-smouldering fire at the pit and caused a blast on the surface. Workers inside the mine's deep tunnels, as well as people on the surface, were killed in the disaster.

The fissures in the pit's walls were believed to have allowed the flammable gases to cause a coal dust explosion underground. The cause of the initial fire was suspected to be either because of the mishandling of mining explosives or due to the ignition of methane by the flame from a miner's lamp.

3. Mitsubishi Hojyo Coal Mine Disaster (1914) - Japan

Mitsubishi Hojyo coal mine disaster, the deadliest mining accident in Japan, caused 687 deaths. It was caused by a gas explosion at the Mitsubishi Hojyo coal mine located in the Kyushu Island of Japan. The disaster took place on 15 December 1914.

The gas explosion, which occurred underground, caused thick black smoke to come gushing out of the air vents before it finally blew the elevator cage 15m up into the air with a massive blast. People within a 200m radius of the mine entrance were also impacted by the explosion.

4. Laobaidong Colliery Disaster (1960) - China

Laobaidong coal mine disaster, the second

deadliest in China after the Benxihu colliery disaster, killed 684 people. The disaster occurred on 9 May 1960 in the Laobaidong coal mine, located near Datong in the Shanxi province of China.

The accident was caused by methane explosion. The information about the Laobaidong catastrophe was suppressed by the Chinese Government for more than three decades until it was revealed in 1992. Laobaidong disaster is the most fatal coal mine disaster since the inception of People's Republic of China (PRC) in 1949.

5. Mitsui Miike Coal Mine Disaster (1963) - Japan

The Mitsui Miike coal mine explosion on 9 November 1963 was the second deadliest coal mining disaster in Japan after the Mitsubishi Hojyo Coal Mine Disaster in 1914. 458 miners were killed in the accident and 833 were injured.

It was a coal dust explosion around 500m below the mine's ground level entrance. The explosion led to a massive blast which collapsed the tunnel roof at multiple locations. Most of the deaths were due to carbon monoxide poisoning.

Most of the poisoned survivors suffered severe brain damage. Miike was one of the oldest and largest coal mines in Japan. It was taken over by Mitsui in 1899. The coal mine ceased its operations in 1997.

6. Senghenydd Colliery Disaster (1913) - United Kingdom

The Senghenydd Colliery disaster is the worst ever mining tragedy in the United Kingdom. The disaster, also known as the Senghenydd Explosion, occurred at the Universal Colliery in Senghenydd near Caerphilly, Glamorgan, Wales, on 14 October 1913.

The fatal disaster was a result of a coal dust explosion in the underground mine. 439 miners

were killed in the accident. Most of the miners who survived the fire and explosion were killed due to carbon monoxide poisoning.

Firedamp ignition, caused by electric sparking possibly from equipment such as electric bell signalling gear, was suspected to have started the explosion. The initial fire ignited the coal dust present on the floor and the explosion travelled through most of the underground workings.

7. Coalbrook mine disaster (1960) - South Africa

Coalbrook mine disaster with 435 deaths is the worst ever disaster in South Africa's mining history. The disaster took place on 21 January 1960 at the Coalbrook North Mine of the Clydesdale Colliery near Sasolburg, Orange Free State, South Africa.

The collapse of around 3km² of underground mine area caused the disaster. The underground collapse was caused by the disintegration of around 900 underground pillars supporting the tunnel roofs.

Around 1,000 miners were at work underground at the time of collapse. Half of them could survive by escaping via an incline shaft. Few rescue workers also died getting trapped with collapsed ground and methane gas.

8. Wankie Colliery Disaster (1972) - Rhodesia (Zimbabwe)

Wankie Colliery Disaster in Rhodesia (now Zimbabwe) killed 426 people. The disaster occurred on 6 June 1972 at the No. 2 mine shaft of the Wankie Colliery, in north-western Rhodesia. The disaster was caused by multiple explosions in the underground coal mine.

The explosion turned into a blast which devastated the main shaft. Four men were killed instantly near the surface. More than 400 mine workers trapped amid rock and deadly methane and carbon monoxide fumes died in the underground.

Coal disaster victims included 36 Europeans and 390 Africans. The initial explosion was suspected to have emanated from a dynamite magazine.

There were also two new explosions on the next day that filled the underground tunnels with clouds of poisonous gas making the rescue attempts impossible.

9. Oaks Colliery Explosion (1866) - United Kingdom

Oaks Colliery explosion is the second deadliest coal mine disaster in the United Kingdom after the disaster at Senghenydd Colliery. The disaster took place on 12 December 1866 at the Oaks Colliery, near Stairfoot, Barnsley, in South Yorkshire.

The death toll of this major nineteenth century coal mine disaster is reported to be 388. It was a firedamp and coal dust explosion suspected to have been ignited by the digging of new workings at the underground mine. The mine was known for containing firedamp since its first disaster in 1847 that killed 73 people.

There were two more explosions on 13 December 1866, which killed 27 rescue workers. The Oak Colliery, one of the largest coal mines in England, experienced 17 further explosions until it ceased operations in the 1960s.

10. Dhanbad Coal Mine Disasters (1965 and 1975) - India

The Dhanbad coal mine disaster occurred on the night between 27th and 28th May 1965. The disaster was caused by an explosion in Dhori colliery near Dhanbad, the major coal mining town in India. 375 miners were killed in the disaster.

It was a firedamp and coal dust explosion. The initial ignition was suspected to have come from the hurricane lantern of a person who entered the underground gallery. The mine's management alleged it to be an intentional act of ignition.

Ten years later on 27 December 1975, another disaster struck the Chasnala colliery, near Dhanbad. The Chasnala mining disaster killed 372 people. The coal dust explosion in the deep mine led to a blast that damaged the roof barrier with a huge water body sitting above it. Most of the deaths were because of the formidable flooding of water into the mine.

11. Monongah Coal Mine Disaster (1907) - United States of America

Monongah Coal Mine Disaster is the largest mining catastrophe in the US. The disaster occurred on 6 December 1907 at two mines of the Monogah mine facility in West Virginia. The number of fatalities in the disaster is recorded as 362. Italian immigrants were the majority of the victims.

The disaster was caused by firedamp and coal dust explosion in mines six and seven of the Monogah mine facility operated by Fairmont Coal Company. The explosion devastated the ventilation system, boiler-house, fan and the openings of the mine number eight.

Rescue workers could hardly work for 15 minutes due to the lack of breathing equipment. Few of them also succumbed to death because of suffocation. The source of initial ignition for the explosion was attributed to either electric arcs or open lights.□

(Source : mining-technology.com)

GROUP DISCUSSION - A NEW INITIATIVE REPORT OF THE GROUP DISCUSSION ON MINERAL RESERVE ESTIMATION SYSTEM HELD ON 8TH APRIL 2017

The Mining, Geological & Metallurgical Institute of India (MGMI) has planned a series of Group Discussions on Technical Issues, the first of which was organized at MGMI building, Salt Lake, Kolkata at 3 PM on 8th April 2017. The subject of deliberation on that day was 'Mineral Reserve Estimation System: Desirability of Switching over to a JORC (Joint Ore Reserves Committee) compliant system'. A total of 47 members, including a number of Past Presidents, Council Members, academics, consultants and industry leaders took part in the deliberations.

At the beginning Shri Prasanta Roy, Hony Secretary, MGMI welcomed the members and explained how this new MGMI initiative can help members to update their knowledge on current topics of relevance to the development of the mining and mineral sector in the country. The opinions expressed at the group discussions can help the MGMI council to formulate its opinion on different topics and can be shared with the policy makers in the Government if such a request is received. Shri Roy then requested Prof SP Banerjee, past president, MGMI, to chair the session.

Prof Banerjee in his introductory remarks spoke on the topicality of the subject of Mineral Reserve Estimation System and especially the pros and cons of switching over to a JORC compliant system from the current UNFC 1997 system prescribed in our statutes. He mentioned how the need of a reliable ore reserve estimation system was felt even a century ago and cited Hoover's (Herbert Hoover, the 33rd President of USA) classification of ore reserves into three

categories - proven, probable and possible - in his book Principles of Mining published as early as in 1909. He then introduced the main speaker of the day, Dr Bhabesh C Sarkar, Professor, IIT(ISM), and Member of the Executive Committee of National Mineral Exploration Trust and also Member, Geosciences Advisory Council, Ministry of Mines, GOI, and called upon Dr. Sarkar to present his paper on 'Essential Dimensions of Geostatistics in Mineral Industry: A Perspective from an Applied Geostatistician, and Mineral Resource-Reserve Classification Systems'.

In the first part of his paper Prof Sarkar explained the principle of geostatistics and its prime importance in exploration planning and ore reserves estimation. He then spoke on modern ore reserves classification and reporting systems used in different parts of the world. Dr Sarkar dwelt on the main aspects of Joint Ore Reserves Committee (JORC) code, United Nations Framework Classification (UNFC) system, South American Code for Reporting of Mineral Resources and Mineral Reserves (SAMREC) and the template used by the Committee for Mineral Reserves International Reporting Standards (CRIRSCO). He opined that the techniques practiced are mostly based on subjective considerations or on judgmental understanding. Geostatistics provides an improved basis for estimates with minimum error variance, free of conditional biases. He emphasized that besides geostatistical analyses; geological considerations constitute essential prerequisites to deliver appropriate importance in decisions concerning the classification of resources and reserves.

He pointed out that over the last decade considerable progress has been made towards worldwide standardization of requirements for estimation and reporting of exploration results, mineral resources and ore reserves. He concluded that confidence level and transparency associated with estimates is of utmost significance and gave examples of the Windarra Nickel project (WA) scam of 1969 and the Busang gold deposit scandal of Bre-X (1997) to illustrate the need of reliability and accountability in ore reserves estimation.

Prof Banerjee then requested the next speaker, Dr A Srikant, Assoc. Professor, ME Dept., IIT Khargpur to give his views on the subject. Dr Srikant said that in India mainly the UNFC 1997 system is being followed. But this system is no longer used in many countries and gradually the CRIRSCO system has become more popular. He felt that India should also move away from the UNFC system. He informed that a National Core Committee (NCC) for formulating the methodology of estimation of resources of Indian minerals has been formed some two years ago, mainly through the initiative of MEAL. NCC is developing an ore reserves estimation guideline suitable for Indian conditions (like an Indian equivalent of CRIRSCO), but at the same time compatible to the systems practiced in major mining countries of the world,

Mr Biplob Chatterjee, CEO and Director, Geovale Services, the next speaker, said for persons like him, the private entrepreneurs, there comes administrative challenges while dealing with parties regarding ore grades and reserves. He emphasized that UNFC is a classification system and lacks the necessary information on financial aspects. Indian minerals need to have a reporting system compatible with systems used in other countries. He mentioned the current practice of estimation / valuation of mineral reserves is based on surveys by Government departments and the reports do not have auditable reliability.

The topic was then thrown open to the house for discussions by the Chairman.

Dr Ajay Moitra, former Director, GSI felt that the quality of geological reports in India will improve if a mining engineer is also associated with the exploration team to provide input from the mineability angle. He also referred to the Chinese system of resource estimation and reporting where even resources yet to be discovered are taken into account. He requested Dr Srikant and others engaged in formulating a new reporting system for Indian minerals to see the Chinese system for guidelines. Shri RP Ritolia, former President, MGMI wanted to know why UNFC system became important in India and whether resorting to CRIRSCO or similar system will solve the bankability problems for investors. Shri SK Choudhuri, former Controller General, IBM mentioned of his discussion with top executives of Mosaboni copper mines in the 1960s when the company practice was to keep capital expenditure on exploration at a low level so that profitability of the mine was not affected. He narrated the situation in the early 1990s when the UNFC system was introduced in India and the problems faced by IBM in changing over to the new system from the old one. Dr Srikant pointed out that in the UNFC system, competency and responsibilities are not fixed. Shri RK Saha, former President, MGMI mentioned the problems he recently faced while interacting with mining representatives from Poland and Rumania who earlier followed the UNFC system but have now switched to a JORC compliant system. Shri TN Gunaseelan of the consultancy firm DMT narrated his experience of dealing with bankability of mining projects and suggested switching over to a JORC compliant system. He questioned the desirability of Government control over the estimation and valuation system of mineral deposits which should be dealt with by mining and geology professionals. Shri P Kumar, former CME of

CMPDI and a past Hony. Secretary of MGMI Ranchi Branch, suggested that ownership and transparency should be there in the system being proposed. Dr Anupendu Gupta, former DDG, GSI said that the UNFC system was thrust upon the subsidiary departments by the Ministry of Mines hurriedly and so there are many flaws in the reported estimates of ore reserves. Shri Smarajit Chakraborty, former CMD, ECL opined that MGMI should constitute a small working group to make in depth study of the proposed switch over to a CRIRSCO based system. Shri Prasanta Roy, Hony Secretary, MGMI shared his experience of dealing with coal deposits abroad, in South Africa, Mozambique, Australia and Indonesia and suggested the switch over to a system that will be acceptable to Global Investors. Shri S Bhattacharya, Director (Mines), HCL also spoke on the occasion and appreciated the opportunity to exchange knowledge on this important topic provided by the event.

At the end Dr Srikant said that a meeting of the National Core Committee will be held shortly at Hyderabad and he requested MGMI members to attend the meeting or send useful suggestions. He suggested that MGMI may organize a 2-day workshop with the help of CRIRSCO experts, so that members may become more familiar with that procedure. It was reported that such workshops have been organized by MEAI in Jaipur and Hyderabad.

In his concluding remarks, Prof Banerjee suggested that most of the speakers supported the idea of switching over from the UNFC 1997 system to a better system of ore reserve estimation that will incorporate a greater degree of transparency, reliability and acceptability by the global mining community. He asked the audience for their opinion on the frequency of such Group Discussions and the view received was that we should organize such events once in two months.

The event concluded with a Vote of Thanks by Shri Prasanta Roy, Hony Secretary, MGMI at 5.15 pm.

REPORT ON THE 1ST MEETING OF THE WORKING GROUP FOR PREPARATION OF ROAD MAP SUGGESTING ALTERNATIVE REPORTING SYSTEM FOR COAL

The Working Group for preparation of Road Map suggesting alternative Reporting System for Coal, constituted by MGMI Council at its 875th meeting, held its first meeting at MGMI Hqs. on 03/06/2017 at 3 P.M. The meeting was attended by Prof. S P Banerjee, Shri Biplab Chatterjee, Dr AK Moitra, Shri Phalguni Guha, Shri TN Gunaseelan, Dr Anupendu Gupta, Shri Ranjit Datta, Dr NB Chanda, Shri Prasanta Roy.

Shri Prasanta Roy apprised the members that as per the decision at the last Council meeting, a Working Group has been constituted for the purpose of suggesting alternative Reporting System for Coal. The task of the working group should be to formulate a reporting system for Coal deposits, compatible to the other reporting systems of the world and acceptable to the industry as well as to the Government. He requested Prof SP Banerjee to Chair the meeting.

It has been pointed out by the members that currently the national inventories for coal and lignite are prepared by Geological Survey of India annually after collating data from other exploring organizations like CMPDI, MECL, SCCL, NLC, State Governments. The inventories report Measured, Indicated, Inferred and Prognosticated resources as per UNFC norm, coding the deposits as 331, 332, 333 and 334 respectively. Here only the geological axis of the UNFC block is considered, leaving aside the two other, economic and feasibility axes, as hardly any estimation as done on these

two aspects. Members from industry indicated that this system is not acceptable to the capital market and questioned the transparency and accountability of this type of reporting system. Members agreed that the proposed system should take into account the transparency and accountability factors. The report on the deposits should be prepared by competent persons. Some members pointed out that the feasibility and economic aspects of a deposit will not be determined by a Government or exploring agency. It has to be done by the exploiting agency or the investor.

S/Shri TN Gunaseelan and Biplab Chatterjee informed that a National Core Committee (NCC) has been set up for formulating the reporting system for Indian Minerals and MEAI is the, Nodal agency in India, working on the CRISSCO template to indigenize it. MGMI is also a Core Committee member. No representative

from to MGMI attended the last meeting of CRISSCO & MEAI at Jaipur in October 2016. The National Core Committee had formed six sub groups for going for in-depth study and formulations of drafts on different aspects like reserve assessment, legal aspects, concept of competent persons, transparency etc. It is also informed that a draft has been prepared by the said committee. It has been decided that the available draft documents will be obtained by MGMI and mailed to the members of the present committee for study and expressing their views in the next meeting.

It has been agreed that there is need for a reporting system for Indian Coal compatible to international systems like CRIRSCO. Members suggested a workshop on this subject be organized by MGMI to educate its members.

The next meeting is scheduled after three weeks.□

There is no way to Happiness - Happiness is the way :
Thich Nhat Han

AN UNFORGETTABLE SAD INCIDENT

SC Agarwal

After graduating in Mining Engineering from BHU in 1963 and obtaining Second Class Mine Managers' Certificate of Competency (Coal) in 1965, I obtained First Class Mines Managers' certificate (FCC) in 1966, and was deputed to serve as Dy Manager of Chinakuri - 1&2 pits Mine, belonging to M/s Bengal Coal Company, (Andrew Yules) in West Bengal.

It was some time in 1967, Mr LN Ohri, Manager, Chinakuri 1&2 pits, went on short leave and I was Officiating as Manager of the mine. In those days even officiating as Manager of a mine and that too of mine like Chinakuri 1&2 pits was of great opportunity for gaining experience.

Chinakuri 1&2 Pits was the then deepest (+2000ft) coal mine in the country, highly gassy and it was here 1st continuous miner, Drum Shearer, was installed in 1965-66 on 300' ft Longwall face.

General shift was usually supervised by a Dy Manager, having First Class certificate and the other 2 shifts were manned by Under Managers having 2nd class Mines Manager certificate. Besides qualified personal, there were about 8-10 Post Graduate Practical Trainees, usually called PGPTs, used to be deployed in all three shifts performing variety of jobs and acquiring knowledge and experience in actual coal mining operation.

In those days even a graduate engineer, after qualifying 2nd Class examination and acquiring additional 1 year of field experience, had to appear for 5 written papers and on qualifying written examination had to appear for 5 oral tests. Qualifying First Class Mine Manager Certificate to manage a coal mine, used to be one of the toughest examination, result ranging 5-8%.

In the supervisory team of the mine, we had one Second Class Under Manager (name withdrawn) who appeared for First Class Mine Manager's examination conducted by DGMS in 1966-67. Final result was scheduled to be declared on the day. I had some apprehension about the result of the Under Manager. He was on duty in 3rd (night) shift.

Unfortunately he could not qualify in the examination. Looking to his unfavourable result and his state of mind, I asked him to take off from duty and relax. But he posed to be OK and presented himself for night duty. Yet, I directed one of the PGPTs in 3rd shift to take care of him and not to leave him alone any time.

It was about 12.45 mid night that security guard called me at my bungalow informing "*chotta sahib doli se gir gaya hai*," meaning that the Under Manager of the shift has fallen down the cage. In coalfield Under Manager used to be called Chotta Sahib and Manager as Bada Sahib.

I immediately rushed to pit top accompanied with another Senior Under Manager, Mr Mahapatra residing close by to my bungalow. On reaching the site it was learnt that the Under Manager's body was smashed, fragmented and scattered at pit bottom. The fragmented body parts were collected in a bag.

Sequence of event of the incidence were narrated as "after all miners, supervisory staff on duty in the shift went down the pit, the shift Under Manager asked the shift PGPT to bring 2nd shift report from Lamp-cabin, located steps down. After the PGPT left for Lamp cabin, the Under Manager asked banksman to give him cage to go down the pit. Unaware of his intention banksman provided him the cage, he got in and banksman signalled to lower down the cage."

Sequence of events and happening thereafter, were only speculated and assumed that: "soon after cage started descending, he must have

un-strapped his belt tied with cap-lamp, took off his helmet, his wrist watch, the stick normally carried by supervisory staff, and put down all on the floor of cage he was going down; opened cage gate, and jumped down off the cage. He must have been mid way when he jumped". All his belongings were found intact in the cage.

It was very unfortunate that we lost a bright mining graduate who took such extreme step just for not qualifying FCC in first attempt. It is now Farmers are taking such extreme step. This is neither appreciated nor acceptable to civil society.

There were many such Second Class Managers who could not qualify First Class Manager certificate even after 5-6 attempts. Even many contended to be Second Class manager throughout their career.

The incident remained unforgettable for me even after lapse of 50 yrs.□

Someone is sitting in the shade today because someone
planted a tree a long time ago : Warren Buffett

MALAYSIA

Malaysia is a significant oil and natural gas producer in Asia and is strategically located amid important routes for seaborne energy trade. Malaysia is the world's third-largest exporter of liquefied natural gas and the second-largest oil and natural gas producer in

Southeast Asia. Rising domestic and regional energy demand is prompting Malaysia to invest in upstream oil and natural gas projects and in downstream infrastructure such as oil and gas import terminals, storage facilities, and refining capacity to ensure adequate energy supply.

Figure - 1



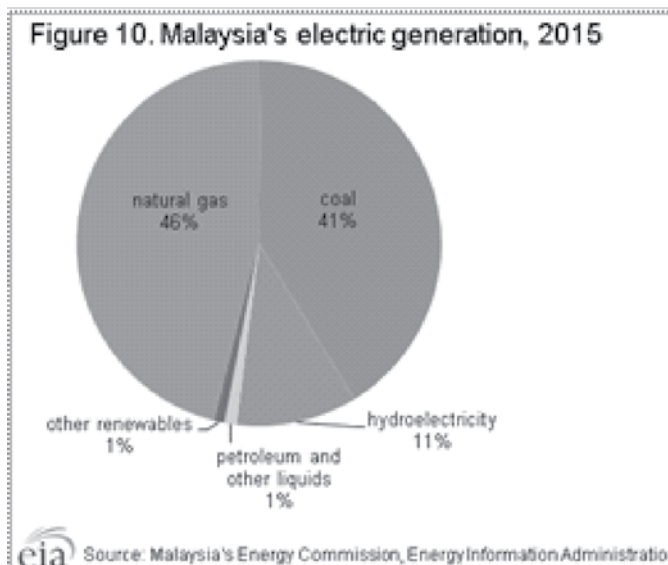
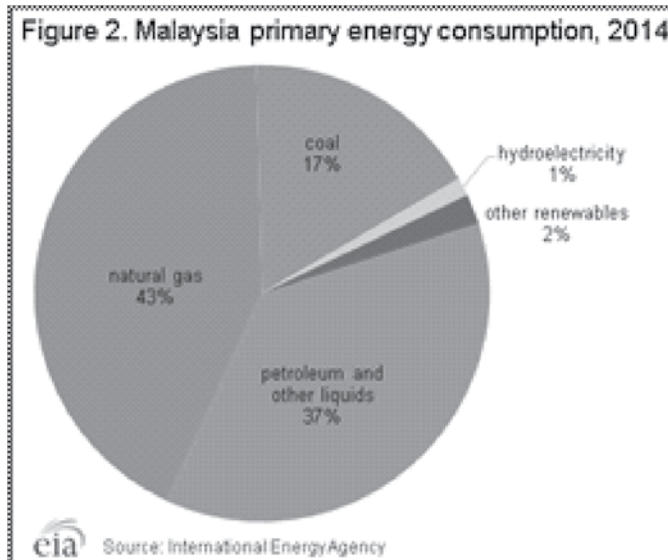
Malaysia has two distinct parts. The western half contains the Peninsular Malaysia, and the eastern half includes the states of Sarawak and Sabah, which share the island of Borneo with Indonesia and Brunei. The country's western coast runs along the Strait of Malacca, an important route for the seaborne trade that links the Indian and Pacific Oceans. Malaysia's position in the South China Sea makes it a party to various disputes among neighbouring countries over competing claims to the sea's oil and natural gas resources. Although it has bilaterally resolved competing claims

with Vietnam, Brunei, and Thailand, an area of the Celebes basin remains in dispute with Indonesia. Potential territorial disputes with China, Vietnam, and the Philippines could emerge as the country's exploration initiatives move into the deepwater areas of the South China Sea.

Several major upstream and downstream oil and natural gas projects have been commissioned in Malaysia during the past few years as part of the country's strategy to enhance output from existing oil and natural gas fields. The long-

ruling Barisan Nasional party (BN), has a track record of promoting hydrocarbon investment, and it intends to continue boosting oil and natural gas production, reforming the energy sector to attract more investment, providing fiscal incentives to expand the use of Malaysia's renewable energy, and developing the country's energy infrastructure. Significantly lower oil and natural gas prices since the latter half

of 2014 have negatively affected Malaysia's export revenues and hydrocarbon investment. However, in an effort to lower its fiscal deficit, the country has reduced its energy subsidies to end users and raised economic consumption taxes in the past few years. Malaysia aims to diversify its fuel slate and move further downstream to become an oil and natural gas trading hub.



Malaysia's heavy reliance on oil and natural gas to sustain its economic growth led the government to emphasize fuel diversification through investments in renewable energy, particularly biomass, solid waste, and solar. The power sector's recent investment in more coal-fired power could raise the share of coal consumption in the next few years.

Electricity Generation and Capacity

Country's Total installed generation capacity at the end of 2014 was more than 30 gigawatts (GW), located mostly in Peninsular Malaysia. The government's efforts are centered on meeting the country's rising electricity demand through a more balanced portfolio of electric generation using coal, renewable sources, and to a lesser extent, natural gas. Malaysia's policy to reduce power consumption also entails reforming electricity prices to be more reflective of market values and promoting energy-efficiency measures.

Fossil fuels, primarily coal and natural gas, made up about 81% of Malaysia's installed electric generation capacity at the end of 2014 and 88% of the country's electricity output in 2015 (Figures 3). Malaysia still relies on natural gas to fuel a large portion of its power plant generation, and all three states are constructing combined-cycle units to replace less efficient natural gas power plants or diesel units and supply a growing electricity market.

Coal, which accounted for 25% of Malaysia's total installed capacity and 41% of electricity generation in 2015, has become much more economically competitive with natural gas for power generation feedstock. Malaysia produced about 3 million short tons of coal in 2015, or about 10% of its coal consumption. The country is limited in domestic coal reserves, the majority of which are located in Sarawak. Sarawak uses all of the coal production for its

coal-fired facilities, and Sarawak Energy is constructing the 600-MW Balingian project, which is scheduled to commence operations in 2018. Malaysia's coal imports, mainly from Indonesia and Australia, rose to 27 million short tons in 2016 from 22 million short tons the year before and have been used to fuel the country's expanding coal-fired generation.

Hydroelectricity, which accounted for 15% of Malaysia's total electric capacity and 11% of electricity generation in 2015, is undergoing significant expansion. Most of the hydroelectric facilities are small or medium sized and are located in Peninsular Malaysia. However, the Sarawak state has the most potential for hydroelectric growth considering its rainfall and geography.

As part of the government's Sarawak Corridor of Renewable Energy (SCORE) program, which is designed to use Sarawak's vast energy resources to serve the power needs of several proposed energy-intensive manufacturing projects, the state intends to increase generation capacity from domestic hydroelectricity and other renewable sources through 2030.

Malaysia encourages investment in other types of renewable energy projects as part of its efforts to reduce carbon dioxide emissions 40% from the 2005 level by 2020, to cut greenhouse gas emissions intensity of gross domestic product by 45% by 2030, and to diversify its electricity fuel mix. As part of this endeavour, Malaysia enacted feed-in tariffs for solar, biomass (primarily from the country's sizeable palm oil production), biogas, and mini-hydroelectric projects. TNB has estimated about 800 MW of large-scale solar power coming online in Peninsular Malaysia and 200 MW in Sabah by 2020.□ (Source : extract from Net)

(For more information on Malaysia's energy sector, Contact : cabs@eia.gov)

100 YEARS AGO

Report on Mining Education in England with special reference to India (An extract)

By

G.F. Adams, E. H. Robertson and Glen George

(Contd. from last Issue)

We propose briefly to refer to the above two problems seriatim.

APPLICATION TO INDIA

We now come to consider the application of the foregoing to India. We must point out that the conditions appertaining to mining in India – we refer now especially to coal mining – are approaching British conditions as regards elements of danger and complexity of methods, that is to say, the dangers are being increased and the proper application of the methods to deal with them are necessitating a higher technical knowledge.

Indian mining is regulated by a Mines Act as in England, and this Act provides that for every mine there shall be a manager, who is responsible for the safe working of the mine. This entails the maintenance of a staff of subordinate officials, to make the necessary inspections and carry out various duties, in order to see that the many dangers connected with mining, occurring as they do daily and hourly, are minimized.

The problem in India, as regards coal mining education, is, we submit, twofold: firstly, it is necessary to train technically the colliery manager, and, as far as possible, to make India self-supporting in this respect; secondly, it is necessary to train technically the subordinate colliery official, with whom we include the second-class certificated manager.

Education of the Colliery Manager.

As we have stated before, there are three methods of imparting mining instruction: firstly, by evening classes, including one-day-a-week classes; secondly, by a mining department associated with an engineering college or a university, or both, and, thirdly, by a self-contained school of mines.

As regards evening classes, our investigation has led us to the conclusion that, while these classes are essential for the education of subordinate colliery officials, they cannot suffice in India for that of the first-class certificated colliery manager, if the Indian, or European born in India, is to take the place of the colliery manager from England. In new countries, speaking from the mining point of view of which India is typical, mine managers have to do much for themselves, which in England they can get done for them, and we think that a technical training is of special importance to the Indian mine manager.

We feel convinced that a School of Mines is the best way to effect such training. The question remains, should it be attached to a University or Engineering College, or should it be self-contained. There are no doubt many advantages in attaching a school of mines to a university or

*Source : Transactions Mining & Geological Institute of India. Vol. XI, 1917.
(The source spelling and punctuations have been retained.)*

a large engineering college. It was specially impressed upon us by the Vice-Chancellor of Leeds University what a great moral and intellectual good is obtained by a young student who is preparing for any profession, having to rub shoulders and exchange ideas with students preparing for other professions. It was also pointed out, from the economical point of view, how much more advantageous it was for mining students to obtain their necessary training in Mathematics, Chemistry, Physics, Mechanical and Electrical Engineering, all of which are necessary for the modern mine manager, in company with students taking up other branches. At the mining school, which is one department of the University of Leeds, all the engineering students, including mining students, do their Mathematics and Science together. The mining students use the same laboratories for mechanical and electrical engineering as students who are going in for those two branches only.

Against this it was pointed out to us that it would be better for mining students to be taught Chemistry and Physics, etc., in classes confined to such students, as in that case the course of instruction could be specialized in accordance with the subsequent requirements of the student.

Considering, however, all our needs and our situation in India, and assuming our coalfields to be at Sheffield, and Calcutta to be London, we put the following question to Professor Ripper of Sheffield :- Supposing there were no University nearer than London and it were a case of attaching a school of mines to it and making a young man go from Sheffield to London to attend it, or of putting a self-contained school of mines in Sheffield, which of the two schemes would he advocate? Professor Ripper replied in that case of course he would advocate a self-contained school of mines in Sheffield.

In India, this would be equivalent to erecting a school of mines in the coalfields, much on the lines of the school at Treforest, and we are of opinion that this would be a correct policy to pursue. We consider that such a school of mines should be entirely self-contained, that is to say, both the necessary Science and Mathematics should be taught there, as well as mining. In the case of Treforest (see appendix VI) students proceed on certain days in the week to a University, 11 miles away, for their scientific and mathematical instruction. These conditions do not apply to India, and we consider that the course at the school should be a complete one. ...

It may be argued that to cut off a school of mines from a University connection will make it impossible to create a degree in mining, such as the B. Sc. Degree in mining at the English Universities. We do not consider it advisable to create such a degree in India, at any rate for some years. The diploma course will be sufficient to give an education necessary for our present needs, and to create a mining degree would be in our opinion to outweigh the school.

We therefore advise that, for the education of the colliery manager, a school of mines should be established at Dhanbad or Asansol, and we would even go to the extent of advising the Government of India that if such a school of mines as we advocate is built, the standard of knowledge required for the first-class colliery manager's certificate in India should be such as can only be obtained by a course at this school.

At the same time we wish to point out that if such a school is to be a success, it is essential that it should be recruited from every province in India. The schools of mines in England are situated in the midst of densely populated industrial areas, and there are large communities from

which mining students may be drawn. This is not so in India, whose coalfields are sparsely populated. Notwithstanding, it is a noteworthy fact that, so far, such colliery managers and officials as are obtained as India are confined practically, both as regards Europeans born in India and as regards Indians, to those who live in the neighborhood of the coalfields. We think this is unfortunate for the country, the industry, and the individual, and we consider that whatever forms of mining education are adopted, such education should be open to the whole of India. We have alluded to making India self-supporting as regards its mine managers. In our opinion, colliery management does open a large and lucrative field of employment for the

Indian and for the European born in India, the latter class of whom especially are, owing to their ever-increasing numbers, finding it more and more difficult to obtain suitable employment in the country and, with this in view, and with the success of such a school in view, we consider that it should be recruited from any province in India, and that every advantage should be taken of the very large field which the entire country affords. In every province and in every way the advantages of a mining career should be advertised, and the assistance and co-operation of local Governments sought.□

(Contd. to next issue)

A smooth sea never made a skilled sailor.

MEMBERS THOSE WE LOST

Surendra Nath Padhi



Surendra Nath Padhi, a Life Member (2770-LM, 1976-77) of MGMI passed away on 05th April, 2017 at Bhubaneswar. With heartfelt grief the MGMI members wishes his soul to rest in peace in his heavenly abode. May almighty give strength to his surviving family members and friends to bear the loss.

Surendra Nath Padhi graduated in mining engineering from the then ISM, Dhanbad in the year 1960. Padhi retired on superannuation as Director General of Mines Safety (Govt. of India) on 31. 07. 2000 with 33 years of service in the department including two years seven months in the highest chair of the department. Padhi had a bright academic career throughout. He got FIRST position in the First Class Mine Managers' (Coal) Certificate Examination. He also held Surveyor's and First Class Mine Managers' (Metalliferous) Certificate. During initial period of his service, he worked in some deep, gassy, problematic, and productive coal

mines (Ningah, Sripur, Girmit, Kunostoria, Amlabad) of reputed mining companies (Andrew Yule, Turner Morrison, KCT) during pre-nationalisation era. Padhi joined Department of Mine Safety as a Deputy Director in 1967 and was promoted to the post of Joint Director, Dy. Director General and finally to the post of Director General on 01.01.1998. He left his mark wherever he worked and had remarkable achievements in the sphere of his work and much beyond. Fatality and serious injury rates reached the lowest in 1998-99 during his tenure as Director General. An expert in the fields of Mine Planning, Mines Safety Engineering, Legislation, Training and Human Resource Development, Innovative Mining Systems, Slope Stability, Mine Environment & Pollution Control, Blasting, Strata Control, Disaster Control and Management, Mechanisation of Opencast and Underground mines etc., Padhi has authored about 50 technical papers presented at International and National fora and published in prestigious journals. He was inducted to the 'Board of Directors of OMC Ltd, Bhubaneswar (a state govt. undertaking) & MOIL, Nagpur. He worked as Director, OMC Ltd upto 2016 end.

Late Padhi had a very amiable personality. Despite his high status, he was very much approachable by one and all. He is remembered for his ever smiling personality.□

Prof MP Singh



Prof MP Singh, a Life Member, (6292-LM, 1992-93) of MGMI left for his heavenly abode on 13th April, 2017 in Varanasi. The MGMI family prays that his soul may rest in peace in his heavenly abode and his family members gain strength to bear the irreparable loss.

Prof Singh was born on 10th September 1957. He was serving as the Head of the Department of Geology, Banaras Hindu University (BHU).

He graduated in 1978 and obtained his Ph D degree in 1981, both from BHU. Prof Singh had an illustrious career at BHU and led the Coal Petrology group of an academic department in the country. He was instrumental in establishing an Advanced Coal Petrology Lab in the department which is first of its kind in any Indian University. Prof Singh published over 75 papers in reputed journals. He was a recipient of “Subrata Ghosh Award” and “Dr J Coggin Brown Memorial Gold Medal for Geology” awarded by the Mining, Geological and Metallurgical Institute of India for his outstanding contributions in Coal Petrology.

In true sense, he was a friend, philosopher and guide having pleasing personality. He is survived by his wife, a daughter, a son and a large fraternity of friends and students. He will be deeply missed by his family, friends and all members of MGMI for his amiable nature.□

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Dr DN Wadia Commemorative Volume*	1965	15	100
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New Finds of Coal In India–Resource potential and Mining Possibilities	1993	30	300
Computer Applications in Mineral Industry	1993	40	400
Indian Mining Directory (4 th Edition)*	1993	40	400
Asian Mining 1993	1993	85	850
Mine Productivity & Technology	1994	75	500
Maintenance Management for Mining Machinery*	1995	60	600
High Production Technology for underground Mines*	1996	50	500
Mineral Industry Development in India–Issues, Perspective & Policy	1996	20	200
Disaster Prevention Management for Coal Mines, Vol I	1996	50	500
Disaster Prevention Management for Coal Mines, Vol II	1996	50	500
Business and Investment opportunities in Mining Industries (BIMI '96)*	1996	40	400
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2 nd Asian Mining Congress* (Vol I & II)	2008	200	2000
Glimpses of Hundred years of MGMI of India (1906–2006)	2008	50	500
3 rd Asian Mining Congress (Vol I & II)	2010	160	2000
4 th Asian Mining Congress	2012	100	1000
5 th Asian Mining Congress 2014	CD available		
6 th Asian Mining Congress 2016	Pen Drive available		
*out of stock			

**HEADQUATERS ACTIVITIES –
Meeting of the Working Group
for preparation of Road Map for alternative
Reporting System for Coal**



**Technical Session organised by
MGMI Ranchi Branch on May 26, 2017
at CMPDI Ranchi**



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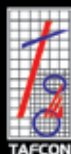
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