



MGMI

News Journal

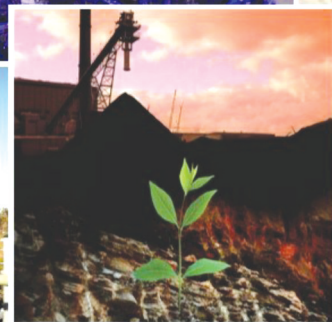
The Mining, Geological and Metallurgical Institute of India

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MGMI Council for 2017-18

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Prof Atul Varma, Former HOD, Applied Geology, IIT-ISM

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Former President & Director ISM Dhanbad



President's Message

During my two years tenure as President of MGMI, I wish to record my heartfelt thanks to all the Council Members, Past Presidents and Members of MGMI for their service, co-operation and advice.

I am honoured to have the opportunity of being working as President for two years being from the non-coal background. The mineral industry at large has seen a paradigm shift in the allocation process, promulgation of new acts and rules. I wish that the distinguished members of MGMI having rich experience and vast knowledge available with them contribute for the betterment of our country's growth path.

I believe that the honourable members of this distinguished Institute will join hands together to make it a professional body of outstanding excellence contributing to the cause of development of Mining Engineering, Geological Sciences and Metallurgical Engineering, so essential for the national Economic development and growth.

With best wishes,

Dr N K Nanda

Dear Members,

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

It is really a privilege for me to address the distinguished members of MGMI through this column and it is my last message as President of MGMI.

Perhaps, you are already in the know that MGMI is going to organize a National Seminar on "Management of Excavation Stability" (MES 2018) at Biswa Bangla Convention Centre, New Town, Kolkata on September 29, 2018 and also arranging for 60th Holland Memorial Lecture and 112th Annual General Meeting of MGMI at the same venue and date.

I would, therefore, request all of you to block the date for participating in these programmes and propagate among the other members and friends.

The earth is not a mere fragment of dead history, stratum upon stratum like the leaves of a book, to be studied by geologists and antiquaries chiefly, but living poetry like the leaves of a tree, which precede flowers and fruit ~ not a fossil earth, but a living earth; compared with whose great central life all animal and vegetable life is merely parasitic. Its throes will heave our exuviae from their graves ... You may melt your metals and cast them into the most beautiful moulds you can; they will never excite me like the forms which this molten earth flows out into.

Henry David Thoreau

• Born: July 12, 1817, Died: May 6, 1862, Occupation: Author

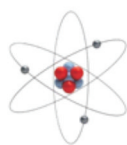


From the Editor's Desk

statesman, Jozé Bonifácio de Andrada e Silva, discovered the mineral petalite ($\text{LiAlSi}_4\text{O}_{10}$) on the Swedish isle Utö in the 1790s. British chemist Augustus Matthiessen and German chemist Robert Bunsen ran a current through lithium chloride in order to separate the element to isolate Lithium in 1855.

Lithium: Let's look out in the World to acquire and Mine Lithium wherever possible

If you are using mobile phones, laptops, digital cameras or started looking for electric vehicles, you must be hearing a lot about Lithium. You may be knowing that Lithium is also used in some non-rechargeable batteries for things like heart pacemakers, toys and clocks. The global lithium battery market is projected to grow substantially in coming years, it may reach 15 billion U.S. dollars in 2020. By 2025, it is projected that the global clean energy demand will account for over half of the lithium carbonate demand worldwide, with U.S. clean energy demand accounting for eight percent of lithium demand. It is expected that Germany, China, Japan, and France will be leading electric vehicle producing countries. India may be used as a market of these countries, if not taken right policy steps now we may not be able to take the benefits of this growth effectively.



Lithium (Li) with atomic number 3 is solid at 20°C with density 0.534 g cm^{-3} , this is the lowest density of all metals. The

credit of its discovery goes to Johan August Arfvedson who finding it in stone in 1817 named as Lithium (Greek 'lithos' means stone). However, according to the Royal Society of Chemistry (RSC), a Brazilian naturalist and

This soft, silver-white metal within the alkali metal group on the periodic table, is being used to produce alloys with aluminium and magnesium, improving their strength and making them lighter. A magnesium-lithium alloy is used for armour plating. Aluminium-lithium alloys are used in aircraft, bicycle frames and high-speed trains. Lithium oxide is used in special glasses and glass ceramics. Lithium chloride is one of the most hygroscopic materials known, and is used in air conditioning and industrial drying systems (as is lithium bromide). Lithium stearate is used as an all-purpose and high-temperature lubricant. Lithium carbonate is used in drugs to treat manic depression, although its action on the brain is still not fully understood. Lithium hydride is used as a means of storing hydrogen for use as a fuel.

Lithium does not occur as the metal in nature, but is found combined in small amounts in nearly all igneous rocks and in the waters of many mineral springs. Spodumene, petalite, lepidolite, and amblygonite are the more important minerals containing lithium.

China, Britain, France, India and Norway are now in favour of electric vehicles. The rapid growth of solar and other renewables will require energy storage technology for effective grid-scale usage. It is predicted that these trends will help push global lithium-ion battery production from 30 GWh per year today to 200 GWh within the next few years.

Electric vehicles usually use lithium-ion batteries nowadays, mainly because the

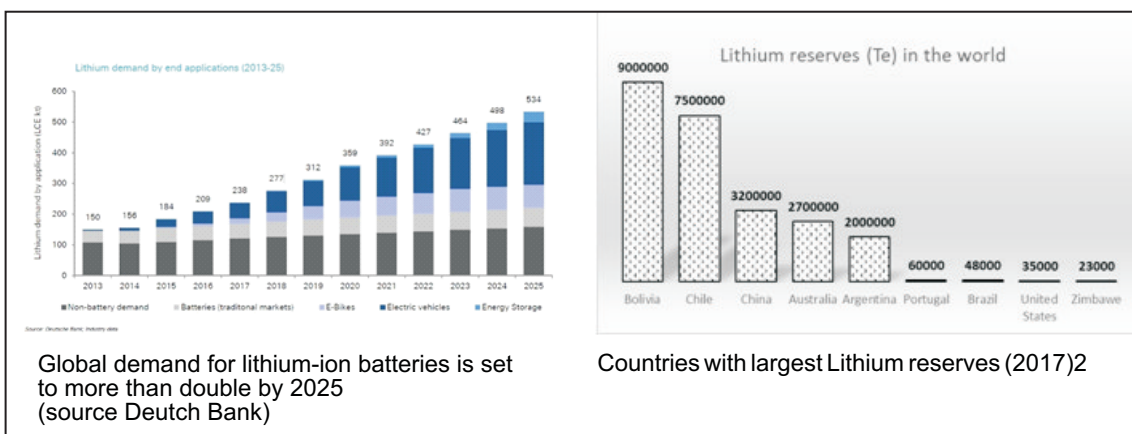
batteries have relatively high energy densities, which range from 100Wh/kg to 300Wh/kg. Demands of these batteries are increasing to make battery packs that can store enough electricity. Lithium-ion batteries employ lithium metal oxide as cathode active material, graphite as anode active material. The electrolyte contains lithium hexafluorophosphate and carbonate solvents. A porous polyolefin separator is inserted between cathode and anode sheets.

There are three lithium-ion battery types for EVs prismatic, pouch and cylindrical. Prismatic lithium-ion batteries can be found in EVs like BMW i3, VW e-Golf and Fiat 500e. The capacity ranges from 20Ah to 100Ah. A battery pack may contain 100 to 300 such batteries. Pouch lithium-ion batteries can be found in EVs like Nissan LEAF and Chevy Volt. The capacity ranges from 20Ah to 50Ah. A battery pack may contain 200 to 300 such batteries. Cylindrical

lithium-ion batteries mainly are being used in Tesla electric cars like Model S. 18650 is the specific type Tesla uses. The capacity ranges from 3.1Ah to 3.5Ah. A Model S pack consists of over 7000 such batteries.

To accommodate different applications, lithium-ion cells vary in size and shape. A single prismatic cell can be used in a battery in a smart phone, while 7104 cylindrical cells (similar to AA batteries, but larger) are wired together to make up the 85 kWh battery pack in a Tesla Model S car. Today, over one billion rechargeable lithium ion battery cells are produced each year for the consumer electronics market alone.

Questions are now being asked about whether we have enough raw materials to meet the growing demand for energy storage technologies - and how sustainable these materials are?



<https://www.weforum.org/agenda/2017/09/lithium-ion-batteries-ethics-global-battery-alliance/>
<https://investingnews.com/daily/resource-investing/energy-investing/lithium-investing/lithium-reserves-country/>

World Lithium Resources:

Owing to continuing exploration, lithium resources have increased substantially worldwide and total more than 53 million tons. Identified lithium resources in the world as reported by USGS is as given below (1 ton= 0.907185 tonne):

Countries	Reserve	Countries	Reserve
Argentina	9.8 million tons	Czechia	840,000 tons
Chile	8.4 million tons	Zimbabwe	500,000 tons
China	7.0 million ton	Spain	400,000 tons
United State	6.8 million tons	Mali	200,000 tons
Australia	5.0 million ton	Brazil	180,000 tons
Canada	1.9 million tons	Mexico	180,000 tons
Congo (Kinshasa)	1.0 million tons	Portugal	100,000 tons
Russia	1.0 million tons	Austria	50,000 tons
Serbia	1.0 million tons		



Bolivia's Largest salt flat in the world at Salar de Uyuni has estimated 9,000,000 t, Lithium which will be about 43 % of the world's known lithium reserves

Bolivia, Chile, China, Australia and Argentina dominate in the global reserve of Lithium, having 98.9% of total world reserve of 15.6 MT (2017) as shown in Figure 2. The rest of the proven reserve are Portugal, Brazil, United States and Zimbabwe. At present maximum production is from Australia, followed by Chile and China.

In nature, lithium occurs only in compounds due to its high reactivity. Chile had the largest lithium reserves worldwide in 2017 by a large margin. Chile had an estimated 7.5 million metric tons of lithium reserves. China came in second with reserves estimated at 3.2 million metric tons.

India needs to expedite to explore for Lithium. Are there any possibility of having Lithium in our produced water in the oil and gas industry? Our geologists and mineral economists might

be telling us some new stories of Indian possibilities in Lithium. Already a consortium formed by National Aluminium Company (Nalco), Hindustan Copper (HCL) and Mineral Exploration Corp. Ltd (MECL) under leadership of NALCO has started working for getting Cobalt and Lithium deposits abroad for boosting future of India's Lithium Battery manufacturing where a demand of 350, 000 te of Lithium per year is expected. Indian R&D on Lithium batteries has contributed good results for example about 141 companies want to use ISRO's VSSC developed a lithium ion cells of capacities ranging from 1.5 Ah to 100 Ah for use in satellites and launch vehicles.

Indian geologists and miners must now go out in the world to acquire and mine Lithium wherever possible.

Khanindra Pathak
Kharagpur

<https://www.statista.com/statistics/268790/countries-with-the-largest-lithium-reserves-worldwide/>

PHOTO GALLERY OF MGMI HEADQUARTERS ACTIVITIES
NATIONAL SEMINAR MES 2018 & the 112th Annual General Meeting
 held on 29th September, 2018 at Biswa Bangla Convention Centre New Town, Kolkata



Dr N K Nanda, President, MGMI delivering welcome address to the Participants, Dignitaries & Guests in MES 2018



Shri Binay Dayal, Chairman, MES 2018 & D (T) CIL introducing the Seminar theme



Shri P K Sarkar, Director General, DGMS & Chief Guest, MES -2018 lighting the Inaugural Lamp of National Seminar. Dignitaries are (from L to R) S/Shri P R Prasad, Binay Dayal, Dr N K Nanda, Anil Kr Jha, Rajiw Lochan



Shri P R Prasad, Convenor, MES 2018 & GM (PAD), CIL addressing to the assembly of the Inaugural Session of the Seminar



Shri Anil Kr Jha, Chairman, CIL addressing to the assembly of MES-2018



Shri P K Sarkar, DG, DGMS and Chief Guest MES 2018 delivering his Inaugural Lecture in the National Seminar MES- 2018. Dignitaries on the dais are from L to R are Shri Rajiw Lochan, DR N K Nanda, Shri Anil Kr Jha, Shri Binay Dayal, Shri P R Prasad



Prof (Dr) O P Varma, Chairman, Technical Session of MES-2018 summing up the Seminar Proceedings



View of the participants of MES -2018



Group Photograph of Dignitaries (from L to R) Shri Rajiw Lochan, Dr P K Rajmeny, Dr Loren Lorig, Dr Jay Aglawe, Dr Srikant Annavarapu, Prof (Dr) O P Varma, Dr N K Nanda, Shri M K Prasad, Shri Suman Saurabh & Jitendra Kr Singh



Shri Rajiw Lochan, Honorary Secretary & Chief Manager (Geol/CBM), CMPDI giving vote of thanks at the Inaugural Session of MES-2018.



Dr NK Nanda delivering the Presidential Address in the 112th AGM



Shri G S Khuntia, Chairman of Bhubaneswar Chapter receiving the Award from Prof B B Dhar, Former President, MGMI.



Shri Anil Kumar Jha, President - Elect & Chairman CIL addressing in the 112th AGM



Shri Rajiw Lochan, Honorary Secretary presenting 112th Annual Report of the Council and audited balance sheet with Income & Expenditure Accounts for the year 2017-18 at the General Body Meeting



Shri Rajiw Lochan, Hony Secretary receiving award on behalf of MGMI Ranchi Chapter from Dr N K Nanda, President and Shri Anil Kr Jha, President - Elect



Shri D K Kundu, Hony Secretary, MGMI Hyderabad Chapter receiving the Award for highest enrolment of Members for the year 2017-18 from Dr N K Nanda, President & Shri Anil Kr Jha, President - Elect



View of the Participants in the 112th Annual General Meeting of MGMI



Group photograph of MGMI Council Members

HEADQUARTERS ACTIVITIES

MINUTES OF 878th COUNCIL MEETING

The Minutes of the 878th Council Meeting of the MGMI held at Hotel Golkonda: 10-1-124, Mehdiapatnam - Banjara Hills Rd, Castle Hills, Venkatadri Colony, Masab Tank, Hyderabad –500028 on 24th February, 2018 at 2.30 p.m. (Duly approved in the 879th Council Meeting held on 28th April, 2018).

Present : Dr N K Nanda, President in the Chair. The meeting was attended by Prof Dhar B B, S / Shri Saha R K, Ghosh Avijit, Talapatra Ranajit, Ghosh Samir Kr, Acharya A, Barnwal J P, Dasgupta Dr. Sajal, Sinha Dr. Amalendu, Shri Kundu D K, Hony. Secretary, Hyderabad Branch, Dr. Mukherjee Abhijeet, Rajiw Lochan and Dr. Rao P V, CRIRSCO .

ITEM No. 0 Opening of the Meeting

0.1 President Dr N K Nanda called the meeting in order and extended welcome to all members present, Past Presidents and conveyed sincere thanks for attending the meeting at Hyderabad thereafter requested Hony Secretary Mr Rajiw Lochan to undertake the agenda.

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

0.2 Condolence:

One-minute silence was observed in the memory of Late Utpal Kr Basu (6085- LM) passed away on 27th December 2017, Late T R Jayaraman (5123 - LM) passed away on 26th January 2018 and Late Prof. (Dr) Ganpat Singh Roonwal (7479 - LM.) passed away on 23rd February 2018.

MGMI family pray to the almighty that their souls may rest in peace and give their family members enough courage to bear the loss and strength to pass through the difficult time.

Utpal Kumar Basu left this material world on 27th December 2017 with heartfelt grief MGMI Members wishes his soul to rest in peace in his heavenly abode. May God give strength to his bereaved family members and friends to bear the loss. Late Basu was a former Director, GSI, born in September 1938. He obtained Master's Degree in Geology from Patna University in 1958. In addition to the assessment work, in which late Basu remained involved throughout his professional carrier, he carried out Geological Mapping and Exploration for Coal in various Coalfields, like Jharia, North Karanpura, Borjan etc. He became Director in May 1992 and took charge of Assessment Division of Coal wing of GSI. He superannuated from service January in 1996. Late Basu was a very good sportsman and was a University Blue and represented GSI team in football. He was loved by all for his pleasing personality.

T R Jayaraman (5123-LM) passed away on 26th January 2018. With heartfelt grief MGMI Members wishes his soul to rest in peace in his heavenly aboard. May God give strength to his bereaved family members and friends to bear the loss.

Late Jayaraman was a member of MGMI since 1987-88. He was former CMD of South Eastern Coalfields Ltd. He was a frequent contributor to the then MGMI Newsletter.

Regular Features

Prof. (Dr) Ganpat Singh Roonwal (7479 - LM.) has left for the heavenly abode on the 23rd February 2018. MGMI family is deeply shocked to know the sad demise of the beloved Life Member and convey deep and heartfelt condolences and pray to God to give the members of the family mental strength to bear this loss. Late Roonwal was born on 12th March 1940. He did MSc and PhD in Geo Sciences. He was Prof. in Geo Sciences in the University of Delhi and retired as Director Geo Sciences.

President there after took the agenda items.

878.1.0 To confirm the minutes of the 877th meeting of the Council held at the MGMI Bldg, Kolkata on 16th December, 2017.

The Minutes were circulated to all Council Members. Observation of Mr J P Goenka was noted. The Council then resolved that:

Resolution : Be it resolved that the Minutes of the 877th (1st meeting of the 112th Session) meeting of the Council held on 16th December, 2017 at Kolkata are confirmed.

878.1.1 To consider matters arising out of the minutes.

The Council then considered the Action Taken Report on the Minutes of the 877th Council Meeting held on 16th December, 2017 at Kolkata and noted the report.

878.2.0 To discuss about the status of Income & Expenditure of the 7th Asian Mining Congress & Exhibition

The Hony. Secretary presented the statement of Income and Expenditure of the 7th AMC 2017 and also placed the information of payment dues from the organisations, specially from M/s TAFCON. It was also mentioned that M/s TAFCON, so far, paid Rs. 10,00,000.00/- only out of guaranteed amount of Rs. 45,00,000.00/- though, according to MoU they were supposed to pay second installment of Rs. 10,00,000.00/- within 31st December 2017 and the balance amount would be paid by 31st

March 2018. Council noted that several reminders have been given by mail as well as on the telephone. The Council noted the state of affairs with concern.

878.3.0 To discuss about the 8th Asian Mining Congress & Exhibition

- a) Date and Venue - The Council proposed that the 8th Asian Mining Congress & Exhibition may be held during November 22-25, 2019, (Friday, Saturday, Sunday and Monday) preferably at Biswa Bangla Convention Centre, Rajarhat, Newtown.
- b) MoU - MoU for the Exhibition with M/s. TAFCON may be prepared which will be signed by the competent Authority of MGMI after receiving full payment on account of Exhibition and Delegate received through them.

878.4.0 To discuss about President's Cup Golf Tournament 2018

- a) Date and Venue - Mr. J P Goenka, Convener, Golf Tournament was not present at the meeting, however, Hony. Secretary presented the summary of the minutes of the Golf Committee and noted that the Golf Tournament would be held at MCL Golf Club, Sambalpur on Sunday the 18th March 2018.
 - b) Budget - The following budgetary provision has been proposed by the Golf Committee for Rs. 3,25,000.00/- break up of which are as
 - i) Give away, Souvenir, Printing, Prizes, Trophy, Lucky Draw, Banner, Stands etc. Rs 2,90,000.00/-
 - ii) Meeting Expenses Rs. 10,000.00/-
 - iii) Travelling Rs. 15,000.00/-
 - iv) Miscellaneous Rs. 10,000.00/-
- Total Rs. 3,25,000.00/-

Against this Budgetary provision of Rs. 3,25,000.00/- the amount will be provided through collection of Advertisements, Sponsorships.

Regular Features

However, Course booking, Hall booking for meeting, Lunch, Dinner, re-freshment Coupon for Caddies with the courtesy of MCL. Treasurer Mr S K Ghosh requested to coordinate it with the Committee.

878.5.0 To discuss on SME proposal on Long Term Association

The President appraised the Council in details about the activities of SME. The Council principally agreed on the proposal of SME on long term association and to agree to be associated with SME and become member of SME for which approximately US\$ 2,000 has to be paid as Annual Membership Fee. By virtue of MGMI Membership, MGMI Members may become member of SME as National Registering Organisation (NRO), i.e. there will be dwell membership of MGMI members, in this regard qualifications as covered for membership of MGMI with 10 years' post qualification experience would be essential to be member of SME for which Memorandum of Article of MGMI needs to be changed in the clause of Membership qualifications and to create another category of membership, besides existing. Council approved the proposal and directed to take suitable action in this regard.

878.6.0 To discuss CRIRSCO Proposal on training curriculum and finalise the report on Mineral Reserves International Reporting Standards (CRIRSCO)

The Hony. Secretary requested Dr. P V Rao, Co-chairman, NACRI to brief and clarify on the admission requirements and the benefits of becoming as Recognized Professional Organisation (RPO) of CRIRSCO. Dr Rao explained in details and been proposed with the following personalities

1. Prof S P Banerjee, Chief Advisor to the Committee
2. Prof (Dr) Khanindra Pathak, Hony. Editor
3. Mr. Bibhas Ch Bhattacharya, Former Editor

4. Mr Binay Dayal, Director (Technical), CIL
5. Dr Anupendu Gupta, Former DDG, GSI
6. Prof (Dr) S K Mukhopadhyay, Former Professor, IIT, Kgp
7. Dr Biswjit Samanta, Associate Professor, IIT, Kgp, Associate Editor SME's Mining Engineering Journal, as Associate Editor for MGMI
8. Prof Atul Varma, HOD, Applied Geology, IIT-ISM

Following personalities will be Consulting Editors and members of the Advisory Committee for the MGMI Journal:

- a) Dr Anindya Sinha, Adviser (Projects), MoC
- b) Prof B K Dubey (For Mine site and Environment, Transportation and Handling and Civil Engineering for Mining)
- c) Prof A R Mohanty (For Mechanization, then the Council has resolved to satisfy the mandatory requirements of becoming as RPO of CRIRSCO. The mandatory requirements include amending MGMI Memorandum of Article to include Registered Competent Person (RCP) in the membership category list, defining the admission requirements, Code of Ethics and Disciplinary action procedures applicable to RCPs. The Council principally agreed to pay around **USD 2000** as Annual fee to NACRI part of which will be transferred to CRIRSCO and rest will be used towards expenses of NACRI. If MGMI is recognized as RPO then MGMI may bear the participation expenses of one NACRI member to attend the CRIRSCO Annual Meeting.

NACRI will provide to MGMI suitable documentation acceptable to CRIRSCO on RCP admission requirements, code of ethics and disciplinary action procedures for incorporating the same as on amendments to Memorandum of Article of MGMI.

MGMI principally agreed to hold a two-day professional training programme to its members in a suitable area in April/ May 2018

Regular Features

on CRIRSCO Template and its compliant standards, applicable to coal and minerals. All the expenses including travel and stay of overseas and domestic faculty, holding the training programme and others will be borne by MGMI.

If CRIRSCO approves India's admission as its member and recognizes MGMI and MEAI as RPOs, MGMI will agree to share the admission ceremony expenses with MEAI equally, in July/August 2018.

878.7.0 To discuss on new MGMI Editorial Committee and its Road Map

The new Editorial Committee of MGMI has been proposed with the following personalities

1. Prof S P Banerjee, Chief Advisor to the Committee
2. Prof (Dr) Khanindra Pathak, Hony. Editor
3. Mr Bibhas Ch Bhattacharya, Former Editor
4. Mr Binay Dayal, Director (Technical), CIL
5. Dr. Anupendu Gupta, Former DDG, GSI
6. Prof (Dr) S K Mukhopadhyay, Former Professor, IIT, Kgp
7. Dr Biswjit Samanta, Associate Professor, IIT, Kgp, Associate Editor SME's Mining Engineering Journal, as Associate Editor for MGMI

8. Prof. Atul Varma, Former HOD, Applied Geology, IIT-ISM

Following personalities will be Consulting Editors and members of the Advisory Committee for the MGMI Journal:

- a) Dr Anindya Sinha, Adviser (Projects), MoC
- b) Prof B K Dubey (For Mine site and Environment, Transportation and Handling and Civil Engineering for Mining)
- c) Prof A R Mohanty (For Mechanization, Machinery, Maintenance and Capacity Utilization)

Panel for special issue will be finalized later on. To make our Journal more visible, a template has been created on MGMI Website as proposed by Editor. The Council approved the proposal and suggested to take all efforts to make MGMI Journal an accredited Journal globally.

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

- a) The Council approved 09 applications out of which 08 for Life Membership and 01 for Associate.
- b) The Council noted the present position of membership which is as follows:

Membership Position (As on 24.02.2018)

	16.12.2017	Add	Trans	Loss	24.02.2018
Member	265	-	-	-	265
Life Member	2487	08	-	02	2493
Associate	39	01	-	-	40
Student Associate	06	-	-	-	06
Life Subscriber	32	-	-	-	32
Subscriber	01	-	-	-	01
Donor	02	-	-	-	02
Patron	04	-	-	-	04
Corporate	08	-	-	-	08
	2844	09		02	2851

Regular Features

Council members pledged to undertake special drive for Life Membership and accordingly propose to achieve 5000 Life Members in current year. Members assured that all efforts will be made in this regard

878.9.0 Any other matter with the permission of the Chair.

1. MoU between MGMI Hq and CSIR-CIMFR, Dhanbad on various Training Programmes. A three man Committee has been proposed by the Council with the following personnel to be the members of the Coordination Committee to Coordinate and Monitor the collaboration.

- a) Dr Amalendu Sinha
- b) Prof S C Ray &
- c) Shri Prasanta Roy

It was also advised to write to Dr Pradeep Kr Singh, Director, CSIR-CIMFR, Dhanbad to nominate Officials from CIMFR who will be member in the Coordination Committee on behalf of CSIR-CIMFR.

- 2. Council directed to install Lift in the MGMI Building which is approved long ago. Hony Secretary informed that efforts has been made in this regard and again in association with WB Authority and expected to undertake the installation and finalization of vendor soon. It is expected that commissioning of Lift will be done in current year only. Council appreciated the efforts and directed to complete it on priority.
- 3. Prof B B Dhar appreciated for organizing the 878th Council Meeting at Hyderabad and particularly thanked to the President and Mr D K Kundu for the same. He also wished that now onwards Council Meeting may be frequently organized at the different states particularly where Mineral and Mining Activities are more.

The meeting ended with Vote of thanks to the chair at 16.00 hrs.

HEALTH TITBITS

Cauliflower gives cancer curry Eating vegetables such as cauliflower in a curry may help prevent and treat prostate cancer, according to new research from the US. Scientists say that the spice turmeric, which gives curry its yellow colour, reduced the development of cancers in lab mice, as did a naturally-occurring substance called phenethyl isothiocyanate. It is abundant in vegetables such as watercress, cabbage, broccoli, Brussels sprouts, kale, turnips and cauliflower.

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MINUTES OF 879th COUNCIL MEETING

The Minutes of the 879th Council Meeting of the MGMI held at MGMI Bldg., GN-38/4, Sector V, Salt Lake, Kolkata 700091 on 28th April, 2018 at 2.00 p.m. (Duly approved in the 880th Council Meeting held on 18th August, 2018).

Present : Dr N K Nanda, President in the Chair. The meeting was attended by Prof Banerjee S P, S / Shri Saha R K, Mandal P R, Talapatra Ranajit, Ghosh Samir Kr, Arora V K, Dr Barnwal J P, Biswas Anup, Chakraborti Bhaskar, Karmakar A K, Prof.(Dr) Karmakar G P, Dr Moitra A K, Prof (Dr).Mukhopadhyay Subir Kumar, Prof Samanta Biswajit, Kundu D K, and Rajiw Lochan.

ITEM No. 0 Opening of the Meeting

0.1 The meeting was Chaired by the President, Dr N K Nanda. President extended welcome to Past Presidents, Council Members and Inviteesthereafter requested Hony. Secretary Shri Rajiw Lochan to take-up the proceedings.

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

Condolence:

One-minute silence was observed in the memory of late Dr Buddheswar Das and late Dr Swapan Gobinda Choudhuri.

Dr. Buddheswar Das, LM 2447 of 1973-74 expired at Edmonton, Canada on 5th March 2018. After graduating in Mining Engineering from ISM Dhanbad in 1956, Dr. Das obtained First Class Colliery Managers certificate in 1959 and worked for a number of years in different Mines in Jharia Coal Field. After obtaining PhD in Mining from Czechoslovakia in 1968 he migrated to Canada. He worked for some years as a Professor at Laval University

and then switched over to a career in mining research with CANMET, first at its Calgary complex and later at the Edmonton Laboratory. Dr Das was well known for his brilliance as a Mining Engineer and was well liked by all for his ever smiling, ego-less, down-to-earth nature.

Late Das was a Life Member of MGMI since 1973-74. With heartfelt grief MGMI Members wishes his soul to rest in peace in his heavenly aboard. May God give strength to his bereaved family members and friends to bear the loss.

Dr. Swapan Gobinda Choudhuri, LM 2232 of 1970-71, Former Dy Director, CIMFR passed away on 14th March 2018. Late Choudhuri was a Life Member of MGMI since 1970-71. With heartfelt grief MGMI Members wishes his soul to rest in peace in his heavenly aboard. May God give strength to his bereaved family members and friends to bear the loss.

President there after took the agenda items.

879.1.0 To confirm the Minutes of the 879th meeting of the Council held at the MGMI Bldg., Kolkata 700091 on 28th April, 2018 at 2.30 p.m.

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 878th (2nd meeting of the 112th Session) meeting of the Council held on 24th February, 2018 at Hyderabad were confirmed.

879.1.1 To consider matters arising out of the Minutes.

The Council then considered the Action Taken Report on the Minutes of the 878th Council Meeting held on 24th February, 2018 at Hyderabad and noted the report as follows:

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I) CRIRSCO proposal on Training Curriculum

The Council discussed the matter at length and agreed with the proposal of CRIRSCO on training curriculum for Registered Competent Person (RCP) during 25-26th May 2018 at Kolkata for which the Council allocated budget provision for Rs. 5-6 lakhs for to and fro Airfare for foreign faculties, local transport, fooding and lodging etc. Mr. P R Mandal, Vice President cautioned the Council about Govt of India recognition for such accreditation. Prof S P Banerjee suggested a screening committee for RCP from MGMI Life member. To include RCP in the membership category list, defining the admission requirement, code of ethics and disciplinary action procedures applicable to RCPs which should also be approved by the General Body before inclusion in MGMI MOA. It can be approved in the forth coming AGM in September or may be called for an EGM earlier as per the situation demanded.

ii) Status on Association with CRIRSCO

The Council discussed the matter and agreed to be associated with CRIRSCO as Member for which it was agreed to pay necessary membership fee, US\$2000, for the timebeing. On becoming Member of CRIRSCO as National Registering Organisation (NRO), there will be dual Membership of MGMI Members. The qualification as covered for Life Membership of MGMI would be acceptable for Membership, however, 10 years post qualification experience would be essential for which "Memorandum of Article of MGMI (MOA)" needed to be changed in the clause of Membership Qualifications and to create another category of Membership for which general body approval is required before inclusion of all those in the "Memorandum of Article of MGMI (MOA)". The Council decided that the new matter inclusion in MOA will be placed before the General Body at AGM sometimes in September next, however, if it

would be necessary early inclusion in the MOA, may call for an Extra Ordinary General Meeting (EGM).

iii) Status on Training Programme to be organized jointly with CSIR CIMFR

The Council noted that a meeting between MGMI and CSIR-CIMFR was held on 14th April 2018 at MGMI Bldg. Various topics proposed for training were identified and some of them were:

- Explosive and Blasting,
- Mine fire and Ventilation
- Quality Control in Mines
- Mine Safety Techniques
- Mining Machinery, Maintenance and Tribology
- Mine Environment / Green Mining/ Global Warming etc.
- Mine Policies and Statutes
- Site Specific Customize Courses
- Mineral Beneficiation

It was also noted that more topics would be invited from the members. It was also further decided to target two courses (one in each week) in the Financial Year. Venue for the Courses would be both at MGMI HQs. and CIMFR Dhanbad. Budgetary estimate would be prepared after the Course Topics were finalized.

879.2.0 To Discuss on the forthcoming events of the Institute.

a) National Seminar 2018 (29th September 2018 at Biswa Bangla Convention Centre, Newtown)

It was decided that the National Seminar will be held on Saturday the 29th September 2018 at **Biswa Bangla Convention Centre, New Town**, for which firm Banquet hall booking with necessary advance is required. So, the necessary action to be taken immediately. The composition of the Organizing Committee as well as Topic of the National Seminar and the Chief Guest for the Inauguration of the Seminar to be finalized and the Hony. Secretary was

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authorized to take initiative in consultation with the President and Senior Council Members.

b) 60th Holland Memorial Lecture

It was also decided that the 60th Holland Memorial Lecture will be held at the afternoon of 29th September 2018 at **Biswa Bangla Convention Centre, Newtown**. The name of the speaker proposed were (1) Dr Pritam Singh, Former Prof and Dean at Administrative Staff Collage of India Hyderabad. (2) Mr. D K Sengupta, Former Advisor, WHO, (3) Dr Pawan Agarwal, CEO of Mumbai Dabbawalas. However, 1st preference would be Dr Pritam Singh.

c) 113th Annual General Meeting

The 113th AGM of MGMI would be held on 29th September 2018 at the same venue.

879.3.0 To discuss about the status of Income & Expenditure of 7th Asian Mining Congress & Exhibition

The Council gone through the statement of Income and Expenditure of 7th AMC & E and noted with great concern regarding the outstanding payment specially for M/s Tafcon Projects (India) Pvt Ltd who organized IME 2017 on behalf of MGMI. Council Members were requested to exert their influence to pursue for early realization of the outstanding payment from some of the Organisations.

879.4.0 To consider the proposed Budget for the year 2018-19

The proposed budget has been approved by the Council as given in Appendix I, however, Rs. 5.00 lakhs have been additionally included for training programme proposed by CRIRSCO which agreed upon by MGMI.

879.5.0 To consider and constitute a Board of Scrutineers to conduct the Election of Council Members for the years 2018-2021.

The Council considered and adopted the suggestion made during 111th Annual General

Meeting regarding increase in gap between the dispatch and receiving of the ballot papers should be 02 months. Accordingly, modification will also be made in the Memorandum and Articles of Association of MGMI at the relevant clause from 30 days to 60 days.

The Council constituted a Board of Scrutineers to conduct the Election of Council Members for the years 2018-21. The Members of the Committee are Shri J P Goenka as Chairman, Shri R K Saha, Member, Shri Amrita Acharya, Member, Shri Ranajit Talapatra, Member, Shri Prasanta Roy, Member and Shri Rajiw Lochan, as Ex Officio Member. The retiring members are Shri V K Arora, Dr J P Barnwal, Shri Anup Biswas, Shri Anil Kr Jha, Shri A K Karmakar and one more post has fallen vacant, due to sad demise of Shri Phalguni Guha. So, there will be a total of six vacancies in the Council for 2018-21.

879.6.0 To consider and appoint Judging Committee Members for various Awards and Medals.

It was decided that the existing list of Judging Committee Members to be revised. The Hony. Secretary was advised to finalise the names of new Judging Committee Members in consultation with the Sr. Council Members.

A new Award has been introduced in the name of **Prof. (Dr.) Mahendra Pratap Singh Memorial Coal Science Award** (A Gold-plated Medal, Cash Award of Rs. 15,000/- and a Certificate). **Criteria** - Any person with academic background of Geology/ Geoscience/ Chemistry/ Chemical Technology, who has proven knowledge and has made outstanding contribution in Coal Science mainly in the areas like Coal Characterization, Coal Petrology, Coal Beneficiation and Carbonization, Coal Combustion, Clean Coal Technologies (CCTs) including Coal Gasification and Liquefaction and value added material from Coal, during the last five years

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including the current year, shall be eligible.

The proposed Judging Committee Members would be Shri Shekhar Saran, Dr Amalendu Sinha, Dr Ajoy Kr Moitra, Shri Ranjit K Datta, Shri Prasanta Roy, Donor Representative and

Hony Secretary / Hony Jt Secretary.

879.7.0 To consider applications for Membership and the Membership position.

a) The Council approved 10 Life Membership applications

b) The Council noted the present position of membership which is as follows:

Membership Position (As on 28.04.2018)

	24.02.2018	Add	Trans	Loss	28.04.2018
Member	265	-	-	-	265
Life Member	2493	10	-	01	2502
Associate	40	-	-	-	40
Student Associate	06	-	-	-	06
Life Subscriber	32	-	-	-	32
Subscriber	01	-	-	-	01
Donor	02	-	-	-	02
Patron	04	-	-	-	04
Corporate	08	-	-	-	08
	2851	10		01	2860

879.8.0 Any other matter with the permission of the Chair.

A) Loan to MGMI Calcutta Chapter

An appeal letter vide reference MGMI CAL/WS-RGIEF&M-18/1 dated 23rd April 2018 received from MGMI Calcutta Chapter intimating that they are going to organise a Workshop on “The Role of Geotechnical Investigations in Foundations Engineering and Mining”, during May 24-25, 2018 at GSI & MGMI CAL Offices at Salt Lake. So, initial seed money is required to organize the Workshop. They requested for releasing a sum of Rs. 1.00 lakh (Rupees One Lakh) only in the form of loan which will be refunded on receipt of the payments at source.

The Council approved for releasing Rs. 1.00 lakh as loan, as asked for by MGMI Calcutta Chapter. The necessary action may be taken on priority.

B) Proposal of Editorial Committee

The Editorial Committee proposed that the quarterly MGMI News Journal will hence- forth be named as '**MGMI News Letter**' and the Technical and Scientific articles will be published as E-Journal. Transactions will continue to publish as usual.

It is expected to create a Readers' base through this E-Journal and will reach out to the Potential Authors in Academic and Research Organisations as well as Industries and Manufacturers through MGMI Website. Editorial Board will work in details on this.

C) Registration of MGMI Delhi Chapter

Mr. P R Mandal, Vice President and Chairman, MGMI Delhi Chapter informed that the Delhi Chapter applied for Registration of their Chapter. Hopefully, Registration will be provided with from Gurgaon Administration.

The meeting ended with Vote of thanks to the Chair at 16.00 hrs.

Report on the National Seminar on Management of Excavation Stability - MES 2018

Inaugural Session

National Seminar MES 2018 on 'Management of Excavation Stability' was organized by the Mining, Geological and Metallurgical Institute of India (MGMI) at Biswa Bangla Convention Centre, New Town, Kolkata on 29th September 2018. The Seminar was attended by more than 145 Delegates, Members, Mining Engineers, Geoscientists, Technologists and Guests. The event was inaugurated by Shri P K Sarkar, Director General, Directorate General of Mines Safety & Chief Guest of the Seminar along with Shri Anil Kumar Jha, Chairman, Coal India Limited.

At the Inaugural session, the other dignitaries on the dais were Dr N.K. Nanda, President, MGMI & Director (Technical), NMDC, Shri Binay Dayal, Chairman, MES 2018, Shri P R Prasad, Convenor, MES 2018 and Shri Rajiv Lochan, Hony Secretary, MGMI. The Inaugural session began with offering of welcome flower bouquets to the guests followed by the traditional lighting of lamp by the guests.

Dr N K Nanda in his welcome address thanked the Chief Guest, other dignitaries, members and guests for spending their valuable time for this event of MGMI. He briefly talked about MGMI, the vast reservoir of talent, experience and multiple expertises it possesses and its activities, highlighting the importance of the topic of the Seminar. He welcomed all the delegates and guests to meaningfully participate in the seminar. He also briefly highlighted the importance of the Seminar topic.

Shri Binay Dayal, the Seminar Chairman and Director (Technical), CIL introduced the seminar theme. He spoke a few words on MGMI and then on coal production in India and with special reference to the contribution of CIL. Supplementing to the importance of the seminar topic, Shri Dayal also covered a wide

field. He Added to his speech the data on domestic coal production, especially by CIL. He informed about the enormity of domestic production of coal of around 700 Million Tonnes along with nearly 1000 M³ to 2000 M³ of overburden and wondered its difficulty and demanding management which would present really a huge problem in the years to come before the Mining Engineers and Geotechnologists, engaged in Coal Production. Attached to this would be the problem of handling slope stability for the control of which innovative geotechnical expertise would be needed.

Dr Loren J Lorig, Senior Geotechnical Expert, thanked to the organizers and expressed his happiness to be a speaker at the seminar. He praised the arrangements made specially for the lighting of lamp by electronic switch. He said that he would present a paper on "Five Things you should know about slope stability".

Shri P R Prasad, Convenor, MES 2018 introduced Shri A K Jha, the invited Guest and the Doyen of Indian Coal Industry. In his introductory address, Shri Prasad described, Shri Jha as a Mining Engineer of extra ordinary capabilities in Mining and Mine Management. Shri Jha, Post Graduate (MTech) with Distinction in Mine Planning and Design from Indian School of Mines, Dhanbad, (Now IIT) with Distinction. He combines a rich and long experience of three-and-a-half decades in Mine Planning, Production, Management and Technical controls of underground and opencast Coal mines. He began his career in 1983 in Central Coalfields Limited. He had held many important assignments and senior positions in CCL. Shri Jha had a 14 year stint in Central Mine Planning & Design Institute (CMPDI). He also served as Director (P&P) in MOIL where he was the Nominated Owner and head of Production, Planning, Projects, Quality

Control and Mine Safety Division and other allied departments including personnel and Industrial relations. Shri Jha is the recipient of “Best Chief Executive Award” conferred by Geo Mine Tech for outstanding performance of MCL during 2017-18. Shri Jha took over the charge of Chairman of Coal India Ltd. on May 18, 2018. Shri Prasad exuded confidence on behalf of the office bearers that his coming as President of the Institute will record a new history of progress in the development of technologies in the three intrinsic fields of the Institute and service to Mining Industry.

Shri Anil Kumar Jha, Chairman, Coal India Limited after being introduced by Shri P R Prasad, praised the organizers of the seminar. He mentioned that in contrast to the media reports that the country was facing shortage of coal, he felt otherwise. He said that CIL's infrastructure is optimum and coal production is jumping year after year. This year's target is 652 million tonnes and it will be 1000 million tonnes by 2025. He also pointed out that the condition of Coal industry is much better in comparison to the other minerals and much needs to be done in non-coal sector. However, he felt exploration activities needed boosting. He expressed good wishes to MGMI mentioning that it was not getting deserved recognition. According to him awareness on excavation management and social impact has increased manifold among the mining community and Coal India and other Mining companies are taking requisite actions in this regard.

He observed that MGMI, as an Institute of repute for experts in Geosciences, Mining and Metallurgy are not fully engaged in the execution of its responsibilities towards development of the concerned disciplines, dissemination of updated knowledge and discharge social obligation towards the fraternities. “The Institute must move ahead to develop more intimate relationships with its members”, he stressed.

In his message, he also emphasised on building awareness on mine excavation management and its social aspects which have come to limelight many folds in recent years. He wished that MGMI in cooperation with CIL should take requisite measures in this regard.

In concluding, Shri Jha hoped that this National Seminar will present correct National and International practices in design, analysis and monitoring of excavation stability for improving safety and economics of mining in coal and metal mines in India.

Shri P K Sarkar, Chief Guest was introduced by Shri Ranajit Talapatra, Hony Jt Secretary, MGMI. Shri P K Sarkar graduated in Mining Engineering from ISM Dhanbad in the year 1981. In the same year, he joined Hindustan Zinc Limited where he worked upto 1988. Shri Sarkar joined DGMS in the year 1988 and served in different positions. He took over the charge as the Director General, DGMS in April 2017. Shri Sarkar visited countries like Australia, United Kingdom, USA etc. in his official capacity for different assignments.

In his illuminating address, Shri Sarkar at the outset expressed his happiness over the opportunity that he got to be with so many stalwarts associated with the Indian Mining and Mineral Industry and has also opportune occasion to share concern of DGMS and seek help and support from the seminar participants to improve safety and well-being of mine workers.

The topic, he affirmed, is rightly chosen and he also eulogized the Mining Geological and Metallurgical Institute of India, the 112th year old, special and highly performing Institute in India and has maintained global recognition being in the forefront of disseminating knowledge and innovating development in all areas of earth sciences.

Shri Sarkar spoke on mine accidents happened between 1997 and 2017 total fatalities in 85 accidents in Open Cast mines were 688, out of which 123 were due to excavation instability. Three were major accidents or disasters. Referring to the seminar theme, he said, **“Management of Excavation Stability”** is very relevant, particularly under ever increasing scale of current mining operations. Moreover, he further said. Contribution of Mining industry to the GDP is to the tune of 2.2% to 2.5 %,but going by the GDP of the total industrial sector, it contributes around 10% to 11%. Economists across the world foresee India's GDP volume to the tune of 5 trillion dollar (about rupees 350 lakh crores) by 2025 from current levels of Rs. 2.59 trillion US Dollar (about Rs. 182 lakh crores). To achieve GDP volume of 5 trillion dollar by 2025 contribution of mining industry must increase exponentially. To share its responsibility towards such growth and energy security of the nation, Coal India has set up an ambitious target of 1 billion tonne coal production by the year 2025.” As opencast mining shall continue to be the primary method of mining, achieving 1 billion tonne of coal production, we shall require excavating about 3 billion cu.m of over burden. If we consider other mining sectors, e.g. iron ore, limestone, bauxite, etc., the volume of earth to be excavated will further increase. Excavation of such volumes will pose large-scale problems related to stability of benches, high walls, overburden dumps, underground openings, etc. Adoption of technology, sharing experiences and R & D work in the field of strata stability, ground control, mine design, etc., may be of great help to counter these challenges. Organising such a seminar, as that of today, provides a very good platform to find way forward.

He also mentioned important factors to be

considered for maintaining effective ground control include: Strength of rock, Geological structure, Presence of water – Surface water (including extreme rainfall events) and groundwater, Slope geometry, Potential weakening of strata due to heavy blasts, poor blasting or excavation practices, Presence of nearby underground mine voids, Vibration due to blasting and seismic events, In-situ or mining-induced stresses and Time dependent deterioration of rock/soil materials. These factors should be considered in detail while designing mine by making geological investigations, using knowledge of geotechnical engineering and computer software. In any mine, unstable strata can have many ramifications, including **Safety factors, Economic factors, Environmental factors and Social factors.**

Planning & designing of a mine is done with available data, obtained from exploration, which has got its own limitation. While doing actual mining operation, new geological information appears, which should be used to modify the mine operations dynamically on day-to-day basis.

A very good Safety Management Plan (SMP), based on risk management principles, should be prepared and implemented to counter potential dangers to men and machine. Principal Hazard Management Plan incorporating Trigger Action Response Plan (TARP) should, too, be prepared, using all the available information, technology and expertise involving all the stakeholders. Preparation and implementation of effective SMP will considerably reduce losses due to potential slope/ ground failure.

He mentioned that the topic of the MES 2018 was very relevant. He also said that this National Seminar will bring up current national and international practices in design, analysis

and monitoring of excavation stability for improving safety and economics of mining in coal and metal in India. He felt, causes of many accidents are basically known which are decisions at top management level in the organization to boost production or lower cost of production. He mentioned that at NCL during last 5 years, accidents were mostly in the last quarter of the production year due to the urgency to boost production at that time. As mining activities are going deeper, management of excavation material and slope stability become important and need cautious handling. Shri Sarkar said that old rules and regulations regarding mine safety are being replaced and DGMS receives help from organizations.

He wished and hopeful that the seminar all the success and will address the most important aspects of today's Mining Industry. Alongside, he informed "What DGMS is doing?". DGMS is working to ease from requirements of the various permission / approval by replacing them with standards where possible, as a step towards self regulation. He said, DGMS has opened up to the requirement of Industry and ready to review the existing standards and policies for the over all benefit of mining and the country. DGMS wish to work as a team for the well being of the society and seek cooperation in this regard. He concluded that the interest of society is much higher than that of the interest of the organization. He hoped that MES 2018 may suggest right steps and processes for safety. He concluded his address by giving some useful informational data on national mining scenario.

The Proceedings Volume of MES 2018 was released by the dignitaries on the dias. The dignitaries were facilitated with presentation of mementoes.

The Inaugural session concluded with Vote of Thanks by Shri Rajiw Lochan, Hony Secretary, MGMI.

Technical Session

The session was set in motion by introductory speech by the Chairman of the session, Prof. (Dr) O P Varma, Executive President, Indian Geological Congress.

Dr Loren J Lorig, Itasca International, Inc., USA, delivered lecture on **'Five Things you should Know about Slope Stability'**. He spoke on slope stability. According to him modern day mining requires the optimization of pit slopes to ensure that the slopes are stable and economic to mine. While several methods are available to help design and monitor the stability of the slopes, there are five major aspects that geotechnical engineers should know when they are involved in slope stability studies. The collection of appropriate data from the project site and the challenges of sampling bias, the problems with using average values in the design of excavations, the impacts of extreme natural events on ground stability, the importance of design validation and the future trends in slope design, analysis and monitoring for enhanced security of personnel and resources are presented in this paper. Case studies which reinforce the impact of each of the above are also presented.

Dr P K Rajmeny, Advisor to Itasca, ABGM (South Africa), presented paper on **'Successful Remediation of a Destabilized Pit Slope & Keeping it Productive for Another 4 Years: A Unique Experience'**. Citing a case history he talked of an open pit mine with its footwall incurring about 600 mm during heavy down pour of August 2014 became destabilized. The movement did spread across a number tension cracks and dilation of geological planes of weakness. At this stage, the pit had to go deeper by another 140 m (120 to -20 mRL) to its designed depth to extract 10-12 million tonne of ore. With the destabilized wall, two options did exist- either bring a push back of the footwall to a depth of 300 m or

remediate the destabilize wall and resume the mining safely. Management trusted the in-house geotechnical capabilities, and a two pronged strategy was adopted applying preventive/ remedial measures and continuously monitoring the behavior of the wall (following slope management plan (SMP) and trigger action response plan (TARP) amid continuing ore extraction with full control measures. The remediation program consisted of a slew of measures like sealing tension cracks, off-loading, enhanced depressurization, cable bolting of geological planes of weakness, etc. The whole gamut was vetted and approved by world renowned consultants like Itasca. The monitoring instruments, post-remediation, exhibited a feeble deformation trend of the wall from 2014 to 2018 (LoMP) indicating efficacy of the remedial measures. The paper presents various details of remediation measures and demonstrates that such a highly deformed slopes can be remediated effectively allowing safe extraction down below under close vigilance of SMP.

A paper entitled '**Case Study : Strategic Recovery & Management of Coal Face after Major Dump Deformation at Khadia (NCL)**' authored by S/Shri P K Sinha, M K Prasad, Suman Saurabh and Manish Kumar. The paper was presented by Shri M K Prasad, General Manager, Khadia Project, NCL. Large Opencast Mines are associated with handling of huge volumes of Overburden. Deployment of Dragline and shovel dumper combination requires appropriate planning for dump accommodation and coal extraction, with due consideration to safety hazard regarding dump failures, apart from other statutory provisions. Study of mine wise specific conditions and use of advance instrumentation for survey and monitoring has become an important aspect for mine operation. This paper presents a case study of dump deformation at Khadia OCP, an investigation of the circumstances, leading to this and the method adopted for safe recovery of the coal face. After facing the risk of slope instability in dragline dumps, a dedicated geotechnical cell has been formed in the project to

improve the Factor of safety of such dumps while considering the economics of the mine.

The paper on '**Assessment of Global Slope Stability of Left and Right Banks of Chenab Bridge by 3DEC**' authored by S/Shri Varun, B Damjanac, L Lorig, J Aglawe and R R Mallick was presented by Dr J Aglawe, Itasca India Consulting Ltd. The design and construction of Chenab River Bridge, which is part of Udhampur-Srinagar-Baramulla Rail Link (USBRL) project in the state of J&K, India, is an extremely challenging engineering task. This paper presented evaluation of slope stability and deformations for both the left bank and right bank abutments under static loading conditions using 3DEC software. In particular, it discusses the important steps for carrying out the discontinuum analyses. These include development of a representative discrete fracture network model using information on geometrical and spatial characteristics of the joint sets obtained from the site characterization program; use of a ubiquitous joint model to represent the strength anisotropy and calibration of such a model using numerical tests; evaluation of abutment stability and deformation without support and finally evaluation of performance of support measures.

Dr Srikant Annavarapu, Technical Advisor, Itasca India Consulting Pvt Ltd, Nagpur presented a paper on '**Development of a Geotechnical Trigger-Action-Response-Plan for Underground Mines**', where in he has mentioned that in view to restrict the number of accidents due to lack of excavation stability in the mines, there have been growing attempts to increase the monitoring of the stability of critical excavations and the initiation of suitable Trigger Alert Response Plans (TARP) to assist in addressing geotechnical issues while they are still developing so that necessary remediation can be started early. The installation of a complex network of geotechnical instruments with continuous monitoring of stress and displacement changes around the excavations

generates large chunks of data which need to be analyzed quickly to assess the ground conditions and request a response from operations groups to undertake necessary remediation. The development of TARP systems will help reduce the response time for handling geotechnical events so that personnel and critical equipment and excavations are not compromised due to inaction or delayed action. A system of geotechnical auditing and ground response analysis will also help in the development of improved excavation and support design. This paper discusses the components of a typical TARP system and how the current systems of excavation stability monitoring can be integrated into the system to help improve safety in the mines. The development of a preliminary TARP system in a block cave mine in Indonesia is also presented.

Shri J K Singh, Chief Scientist of Rock Slope from CSIR-CIMFR, Dhanbad presented a paper entitled '**Effective & Cost-effective Slope Monitoring Potential through Application of 3D Terrestrial Laser Scanner in Indian Surface Mines**'. The paper was authored by S/Shri J K Singh, V K Singh, Ajit Kumar, S K Roy and Ritesh Kumar. Shri Singh mentioned that with the gradually increasing depths of Indian surface mines, ensuring safety of men and machineries is becoming more and more challenging. Whenever a mine slope failure or dump failure takes place, it causes tremendous damage in the form of stoppage of mine, loss of production, loss or damage of costly mining machineries, compensation to families of effected persons. Shri Singh suggested that available monitoring technology using Radars is effective, though its procurement, operation and maintenance may be costly. The paper describes the latest 3D Terrestrial Laser Scanners and sophisticated slope monitoring software.

RECOMMENDATIONS

- Surface and Underground mines are expected to become more challenging and excavation stability problems may be expected to become more complex in the years to come. It is essential to manage the stability of the excavations to help improve safety and economics of the mines.
- New methods of design, analysis and monitoring should be developed and integrated into the mines design and operations. Available tools and processes, including numerical modelling of geotechnical issues, should be introduced in the mine design process and necessary skills should be developed for maintaining the stability of the excavations.
- Adequate instrumentation should be installed in the mines to help improve the understanding of rock mass response to excavation in rock as well soil. Data from such instrumentation program should be integrated into the mine operations for better scheduling and plan.
- Suitable processes for back analysis of geotechnical responses should be developed and used in the monitoring of excavation stability. Development of Trigger Action Response Plans and live numerical models can assist in improving safety and economics of mining operations.
- Steps should be taken to collect appropriate levels of geotechnical data for understanding the rock response and adopt global best practices in the management of excavation stability.

60th Holland Memorial Lecture

The 60th Holland Memorial Lecture was due to be delivered on 29th September 2018 at 4 PM by Dr Kirit Shantilal Parikh, Chairman, Integrated Research and Action for Development (IRADe). The topic of the lecture was '**Future of Coal in Power Generation**'. Unfortunately, Dr Parikh fell sick a day earlier and had been hospitalized. He has sent his lecture material earlier and this was distributed to the members present at the Biswa Bangla Convention Centre and uploaded in MGMI site also for the benefit of all. However, in his lecture

he highlighted that Coal faces severe challenges from environmental considerations. Local air pollution, emissions of CO₂ and even land degradation due to mining, all call for reduced use of coal. Major use of coal in India is for power plants. Dramatic reduction in cost of solar power and battery technology, expected by many, might make coal power generation economically less attractive. In this talk these issues will be explored and some scenarios for future use of coal in power generation will be presented.

However, the lecture is available in MGMI website

Link : http://mgmiindia.in/other/pdf/2018/12_12_2018_60th_holland_mmrl_lctr.pdf

60th Holland Memorial Lecture

at

Biswa Bangla Convention Centre

Newtown, Kolkata

on

29th September 2018

by

Dr Kirit Shantilal Parikh

Chairman, Integrated Research and Action for Development (IRADe)



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

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112th Annual General Meeting

The 112th Annual General Meeting of MGMI was held at the Biswa Bangla Convention Centre, DG Block, New Town, Kolkata 700156 on 29th September 2018. The meeting started with observance of 2 minutes silence to mourn for the departed souls of members who left us during last one year Rakesh Srivastava, Mahendra Pratap Singh, Dr Debasish Sarkar, R N Das, Phalguni Guha, P R Basu, Vinay Mahajan, P K S Guha, Utpal Kr Basu, T R Jayaraman, Buddheswar Das and B N Mukherjee.

The meeting was attended by : Purnendu Sekhar Paul, Arun Kumar Prasad, Smarajit Chakrabarti, Ajit Kumar Singh, Ashis Kr Mondal, Asit Baran Bhol, Suhrid Kumar Samanta, Akhilesh Choudhury, Dr Tapas Kumar Mallik, Dr Sourindra Mohan Kolay, Dr Debdas Ray, Amitabha Chowdhury, Dr Ajay Kumar Singh, B K Jha, N C Dey, Arpita Tripathi, Debabrata Mondal, Sandip Choudhuri, JP Pandey, Dr Srikant Annavarapu, Ajay Jha, Lalit Kumar, G Saikiren, Penchala Abhishek, Nagamalla Shesnag, Sanjay, Dr M P Roy, Priyadarshi Suman, Rituraj, P R Mandal, S Roy, Sr Khanna, A R Sarangi, Arun Chandra Kundu, P R Prasad, Ranjit Datta, Goutam Mukherji, Anupendu Gupta, Debdas Ray, Bhaskar Chakraborti, R K Saha, Anup Biswas, Dr Kalyan Sen, S K Acharya, Dr Samir Dasgupta, L K Bose, J P Goenka, Kalyan Kumar Roy, Prof. G P Karmakar, Amalendu Sinha, N C Jha, M K Prasad, Suman Saurabh, Dr D S Rao, Dr G Sahoo, Dr A Tripathy, Maitrey Desai, R M Bishwal, S K Singh, D K Mitra, A B Bhol, Dr Ashok Kr Singh, Dr Ajay Kr Singh, A K Debnath, A V Sahay, S R Panja, Biplab Mulherjee, Narendra Nath Chattopadhyay, D K Kundu, A K Karmakar, B C Bhattacharya, P K Ray, M K Singh

At the outset the Hony Secretary extended welcome to Dr N K Nanda, President, MGMI, Shri R K Saha, Shri N C Jha, Past Presidents of

MGMI, Shri Anil Kr Jha, President elect, all Members present, Awardees and Guests.

- **To confirm the Minutes of the 111th Annual General Meeting held at the Hotel, The Westin Kolkata Rajarhat on Friday the 10th November 2017 at 3.00 p.m.**

The notice convening the 112th Annual General Meeting was read by Shri Rajiw Lochan, Hony. Secretary, MGMI. Minutes of the 111th Annual General Meeting was circulated to the members. Actions taken on the minutes, especially on election process were presented by the Hony. Secretary and the General Body approved and adopted the Action taken Report. It was also further decided that the ballot papers will be sent to the members by speed post allowing increasing the gap between despatch and receiving of the ballot papers should be at least 60 days. Accordingly, modification has to be incorporated in the Memorandum and Article of Association of MGMI at the relevant clause. The modified Minutes were confirmed by the House.

- **To receive and adopt the Councils Report**, Audited Balance Sheet and Statement of Income and Expenditure Accounts for the year 2017-18 ended on 31st March 2018 (distributed at the House) were approved and adopted unanimously.
- **To appoint the Institute's Auditors for the year 2018-19.** The Council at its 880th meeting recommended the name of Shri Sudip Kr Sen for appointment as Auditor of MGMI at Remuneration of Rs. 12,000/- for assignments of Audit, ROC, Annual filling, IT Returns and GST Returns etc. for the year 2018-19.
- **Announcement of the recommendations and presentation of Awards and Medals for the year 2017-18**

The prize distribution began against performances during the year 2017-18. MGMI

Awards and Scroll of Honors were presented to the awardees by Dr N K Nanda, Shri A K Jha, Shri R K Saha and Shri N C Jha.

- **Dewan Bahadur D D Theacker Coal Mining Gold Medal** awarded to **Dr Ajay Kr Jha**, for his outstanding contribution in Coal Mining.

- **Prof. S K Bose Memorial Award** for Excellence in teaching of Mining Engineering awarded to **Prof B K Shrivastva**, Coordinator, Centre of Advanced Studies, Department of Mining Engineering IIT, BHU
- **Dr J Cogging Brown Memorial Gold Medal** for Geological Sciences awarded to **Prof (Dr) Om Prakash Verma**, Executive President and Hony Editor, Indian Geological Congress
- **R P Bhatnagar Award**, awarded to **Dr Alok Tripathy**, Scientist in Mineral Processing Department, CSIR Institute of Mineral and Material Technology, Bhubaneswar (Gold Medal and cash Award Rs. 5,000/-).
- **H B Ghose Award** for the Manager having best safety performance during the year 2017-18 to **Shri Raj Kishore Singh**, Manager, Gare Palma of underground mine of IV/4 of Hindalco and **Shri Arun Kumar Das**, Manager having best Safety performance during the year 2017-18 of Sarisatoli Coal mine of CESC Ltd. of Opencast.
- **John Dunn Medal** awarded to **Dr Prabhakar Sangurmath**, General Manager (Co-ord), Hutti Gold Mines Co. Ltd.
- **D N Thakur Award** for outstanding contribution in Earth Sciences awarded to **Dr Tapas Kr Mallik** former Director Marine Wing, GSI.
- **Prof (Dr) Mahendra Pratap Singh Memorial Coal Science Award** for significant contribution in the field of

highquality scientific work on Coal exploration and characterization to **Dr Ashok Kr Singh**, Sr Principal Scientist and Head of Research Group, CSIR (Gold Medal and Cash Award Rs. 15,000/-).

- **Indranil Award** for outstanding contribution in Ferrous Metallurgy to **Dr Gadadhar Sahoo**, Sr Manager, Physical Metallurgy Group, RDCIS (SAIL).
- **Lala Ramkishore Singhal Award** for outstanding contribution in the field of Conservation of Minerals to **Dr Danda Srinivas Rao**, Sr Principal Scientist and Professor AcSIR, CSIR Bhubaneswar.
- **Institute's Gold Medal** awarded for the best paper in order of merit read in the OGM and published in the Transactions for the paper on "**Utilisation of LowGrade Chromite Ore for the Production of Carbon Free Ferrochrome**". The paper authored by **Prof (Dr) Rajib Dey, Amit Kr Bhandari, Maharshi Ghosh Dostidar, Sidhartha Mukherjee and Mahua Ghosh Chaudhuri**, Prof in Metallurgical and Material Engineering Department of Jadavpur University.
- **MGMI Branch Membership Growth Award** for the highest enrolment of Members awarded to **MGMI Hyderabad Chapter** for 2017-18.
- **MGMI Branch Activity Award** for the highest no. of Technical Activities awarded to **MGMI Ranchi Chapter** for 2017-18.

Student Awards for 2016-17

- **Pickering Medal** for the Best Student in Mining Engineering awarded to **Shri Tejaswi Agarwal** of IIT (ISM), Dhanbad.
- **Hayden Medal** for the Best Student in Applied Geology awarded to **Shri Abhinav Kumar** of IIT (ISM) Dhanbad..
- **Yule Medal** for the Best Student in Mining Machinery awarded to **Shri Ankur Varma** of IIT (ISM) Dhanbad.

- **Mc Nally Bharat Medal** for the Best Student in Mineral Engineering awarded to **Shri Akash Chandra** of IIT (ISM) Dhanbad.
- **Dr Hari Narayan Medal** for the Best Student in Applied Geophysics awarded to **Shri Vikas Kumar Jaiswal** IIT (ISM) Dhanbad.
- **Oil India Medal** for the Best Student in Petroleum Engineering awarded to **Shri Shlok Rai** IIT (ISM) Dhanbad.
- **Chandrakala Medal** for the Best Student in Petroleum Engineering awarded to **Shri Abhisek Kumar** IIT, Kharagpur.
- **S Lal Medal** for the Best Student in Mining Engineering awarded to **Shri Priyadarshi Suman** of IEST, Shibpur
- **Indranil Medal** for the Best Student in Metallurgy awarded to **Ms Asmita Chakraborty** of IEST, Shibpur
- **Indranil Medal** for the Best Student in Metallurgy awarded to **Ms Priya Akshay Mehta** of IIT, Kharagpur.
- **Smt Nirja Sahay Medal** for M.Sc (Applied Geology) awarded to **Shri Sanket** of IIT, Kharagpur.
- **La Touch Medal** for the Best Student in Geology (3yrs degree course) awarded to **Km Kuhoo Madhav** of IIT, BHU.
- **La Touch Medal** for the Best Student in Geology (2yrs degree course) awarded to **Km Arpita Tripathi** of IIT, BHU.
- **Kalyan Mukherjee “61 Geology” Medal** for the Best Student of M.Sc (Geology) awarded to **Shri Sandip Choudhuri** of University of Calcutta.
- **Roberton Medal** for the Best Student in Mining Engineering awarded to **Ms Khushi Sahu** of IIT, BHU.
- **Nava Bhrath Ferro Alloys Medal** for the Best Student in B Tech Mining Engineering awarded to **Shri R Sanjay Kumar** of Kakatiya University.
- **SCCL Gold Medal** for the Best Student in Mining Engineering awarded to **Shri Gandhe Sai Kiran** of Kakatiya University.
- Presentation of **Scroll of Honour** to the following **Life Members with 50 years** standing of Membership (1967-68) -
S/Shri Babu Ram Marwah, N C Mitra, Pratap Jung Bahadur and Rajender Khoda
- Presentation of **Scroll of Honour** to the following **Life Members with 25 years** standing of Membership (1992-93) -
S/Shri A.B. Wadood Hossain, Dr. Abhijit Mukhopadhyay, Ajit Kumar Chatterjee, Dr Ajoy Kumar Dey, Dr Akshaya Kumar Sarangi, Amal Kumar Das, Amitabha Chowdhury, Ardhendu Sekhar Banerjee, Arun Chandra Kundu, Ashok Govind Watwe, Ashok R Walmiki, Prof Baidya Nath Prasad Gupta, Baskaran Dharam, Braj Bhushan Gupta, Chitta Ranjan Das, Cillanki Rajagopala Rao Ravi, Devapriya Ghose, Dipak Kumar Roy, Durga Charan Panigrahi, G. Vegeesan, Dr. Gajananrao N. Jadhav, Ganesh Chandra Mrig, Gautam Mukherjee, Prof. Dr. Gurdeep Singh, Hridayanandan Tripathy, K. Ramchandran,, K.C. Brahma, K.N. Sharieff, Dr. K. S. Balasubramaniam, Kajal Sinha, Dr. Kalyan Kumar Roy, Kashinath Kadadi, Dr. Kodagihalli V. Krishnamurthy, Dr. M. V. R. Murthy, Dr. Mahendra Kumar Sharma, Malipatil Shankar Gouda, Manoranjan Das, Mohammed Iqbal Alam, Dr. Mrinal Kanti Ghose, Muniswamy Shanth Kumar, N. V. Vijay Gopal, Narendra Nath Chattopadhyay, Dr. Om Prakash Mishra, P. V. Shridharan, Pradeep Kumar Parhi, Pradip Kumar Jana, Pratik Bose, Raj Kumar Sachdeva, Dr. Rajranjan Prasad Verma, Rama Prasad Mukherjee, Ramapada Maiti, Ramesh Khanna, Ranjit Kumar Datta, Ranjit Kumar Paul, Rupen

Saigal, S. K. Mondal, Sailendra Nath Das, Sanat Kumar Mitra, Saradchandra Balakrishna Sarwate, Satish Chand Agarwal, Shakti Priya Banerjee, Shyam Sundar Saha, Dr. Shyamal Kanti Chakraborty, Subal Chandra Mandal, Dr Subha Sankar Sarkar, Subhas Chandra Naulakha, Dr Subhranshu Kanto Acharyya, Subramanian Natarajan, Subrata Kumar Ghose, Subrata Kumar Ghosh, Sudhir Bandyopadhyaya, Suwendu Bose, Dr Swapan Kumar Sarkar, T Kotrappa, Prof Dr Tarakeswar Kumar, Tuhin Kanti Deb, V Satyanarayana, Dr Vermavarapu M S R Murthy.

- Dr N K Nanda, President, MGMI delivered the Presidential Address in the meeting, thanking the Members, Council Members, Staff Members and others Associated with MGMI for the help received during his tenure, that helped smooth functioning of MGMI activities. (Text of the address was distributed amongst the members present, however, it will be printed in MGMI Transactions in due time).

- Declaration of Election of the President for the year 2018-19 The Council at its 880th meeting unanimously elected Shri Anil Kr Jha, Chairman, Coal India Ltd as President, MGMI, for the year 2018-19. Dr Nanda handed over the Presidential Scholler to Shri Jha.

- Shri Anil Kr Jha newly elected President delivered his speech to the members of MGMI and expressed his grateful thanks to the senior members. He also expressed good wishes to MGMI mentioning that so far, it is not getting deserved recognition. He sought blessings from Sr Members and help from Members. He highlighted that MGMI deserves more recognition and for that members need to be more active and should be involved in the activities of MGMI. He suggested that their should be get together parties of MGMI members so that members feel more involved .

- A Committee was formed to suggest on the proposal of becoming a RPO of CRIRSCO for Public Reporting on Estimation of Coal Resources and Reserves under the Chairmanship of Shri N C Jha. Recommendations of the Committee were made and presented at the AGM by Shri N C Jha. The Recommendations made by the Committee said that MGMI should not be associated with CRIRSCO and the recommendations made by the Committee were accepted by the House.

- **Declaration of Election of the Council Members for the years 2018-19, 2019-20 and 2020-21** - Shri J P Goenka, Chairman, Board of Scrutinizers, presented the results of Election of the Council Members. The following Council Members were elected/ re-elected for the years 2018-19, 2019-20 and 2020-21.

1. Shri Akhilesh Choudhury
2. Shri Anil Kr Karmakar
3. Shri Anup Biswas
4. Prof. Bhabesh Chandra Sarkar
5. Dr Netai Chandra Dey
6. Shri Virendra Kumar Arora

Shri Goenka suggested that since response of members for voting is very meager, e-voting may be practiced. Shri Rajiw Lochan, Hony Secretary informed the house that the arrangement for e-voting may take time, however, next year ballot papers will be sent to the members by **Speed Post**, instead of ordinary post. It will keep record of ballot papers sent and undelivered ballot papers returned by post office. The house accepted the proposal.

The 112th Annual General Meeting ended at about 6.45 pm with Vote of Thanks proposed by Shri Rajiw Lochan, Hony Secretary.

Regular Features

CHAPTER ACTIVITIES

Bhubaneswar Chapter

MGMI Bhubaneswar Chapter had a Council Meeting on 01-04-2018 at II, Bhubaneswar Centre and thereafter two technical paper were presented by (1) Shri GS Khuntia on **Raw Materials for Iron and Steel Industries of India** and (2) Dr K Biswal, HOD, Mineral Processing Department, IIMT (B) on **Iron Ore Mineral Beneficiation** or Steel making in India. Shri G S Khuntia, Chairman of MGMI Bhubaneswar Chapter was felicitated with lifetime achievement on 51st Engineers Day at II, OSC, Bhubaneswar.

MGMI Bhubaneswar Chapter was awarded MGMI Membership Growth Award consecutive two years, 2016 & 2017.

Bhubaneswar Chapter sponsored the Seminar which will be organized by II, IEI Bhubaneswar Centre on New Steel Policy of Government of India 2030, status of steel making and raw materials resource development, constraints during October 10-11, 2018.

Calcutta Chapter

The 10th Annual General Meeting of MGMI Calcutta Chapter was held on 23.08.2018 at 14.00 hrs at MGMI Bldg GN 38/4, Sector-V, Salt Lake, Kolkata. The meeting was presided over by Dr Ajoy Kr Moitra, Chairman with Shri Bhaskar Chakraborti, Hony Secretary of the outgoing Council, on the dais.

At the outset one minute silence was observed to pay our heartfelt homage to all the departed souls (including one of our active Executive Committee member Late Swapan Gobinda Choudhury, who expired on 31st March 2018 & other members, whom we lost during this period) and expressed our heartfelt condolences to the family members.

Shri Bhaskar Chakraborti, Hony Secretary welcomed the members present at the meeting and informed the house that the last Executive Committee (outgoing) Meeting, held on 7th August 2018, has recommended the name of Dr A K Moitra as Chairman for the period 2018-2020 and decided the date, time & venue

of the present AGM as per the MOA of Apex body. Secretary requested Dr Moitra to take over the Charge of Chairman of the new Council and preside over the 10th AGM. Accordingly Dr Moitra presided over the 10th AGM.

As per Agenda, Secretary initiated the discussion referring to the salient points of the minutes of 9th AGM, held on 11-9-2016. He presented the Secretary's Report highlighting the activities of the Chapter for the last two years during his tenure from Sept 2016 to August 2018. The Secretary's Report, along with the copies of two audited budgets for 2016-17 and 2017-18 (up to 15th August), was circulated to the members present. He also mentioned that in spite of serious infrastructural & financial constraints and identity crisis faced at times over the past two years, dedication and enthusiasm of the members have proved the Calcutta Chapter as one of the most active and vibrant units of MGMI. And the Calcutta Chapter was duly awarded 'The Best Activity Chapter

Regular Features

Award 2017 at the AGM of MGMI (Apex Body) on 10th November 2017. A Certificate & Trophy were presented to the Chapter.

The matter of Registration of the MGMI Calcutta Chapter and acquiring PAN number was discussed at length. In this context, the Secretary informed that, MGMI notified to all Chapters that as per the decision in a council meeting (of the Apex body), all the Chapters of MGMI should have their own PAN No, and, therefore have to be registered as association or society. It was argued at the council meeting if the Chapter is registered as a separate body, the members will belong to which body, the apex or Chapter. It was also pointed out that presently when a member changes his station, automatically his Chapter membership changes. Thus the Chapter membership is dynamic. No body is a permanent member of any particular Chapter of MGMI. The council offered to ponder over the matter, take legal advice and inform Calcutta Chapter. After ample deliberations at the present meeting, it has been decided that discussions will be held with MGMI authorities, especially with the President of Apex Body on the matter. Shri Bijan Saha, Ranjit Datta, Ashis Roy as also other members opined not use separate address of the Chapter for registration, otherwise it will create a huge identity crisis. Hony Secretary mentioned that all the members are well aware about its formation and activities. The Calcutta Chapter of MGMI came up late and was opened and formally inaugurated on 11 December 1991 at the then MGMI main office, which was then functioning from the premises of GSI at 29 Chowringhee Road, Kolkata - 16. In 1997 MGMI shifted to its own building at Salt Lake and the Calcutta Chapter also tagged along and shifted at the present address for better functioning & coordination. The office of MGMI Calcutta Chapter could have been retained as GSI had

not asked to vacate the same. Therefore, It has been decided that once again the persuasion to be made to get the permission (NOC) from MGMI regarding same Office address. If it is obtained, the application for registration will be submitted and formalities will be completed / done without further delay. It is also approved that the registration will be done under Society / Association Act as 'MGMI CALCUTTA CHAPTER'.

The members present in the 10th Annual General Meeting of MGMI Calcutta Chapter elected the new Executive Committee with the following members for the period from Sept 2018 to September 2020.

1. Shri Binay Dayal, Director (Technical), CIL
Patron in Chief
2. Dr Anupendu Gupta, Dy DG, GSI (Retd)
Patron
3. Shri Akhilesh Choudhury, Dy DG, GSI (Retd)
Patron
4. Dr Bijan Saha, Dy DG, GSI (Retd) **Patron**
5. Shri Adhir Kr Ojha, Chief Executive, O C Ltd.
- Patron
6. Dr Ajoy Kr Moitra, Director, GSI (Retd) -
Chairman
7. Shri S R Panja, Vice President, Hindalco (Retd) - **Vice Chairman**
8. Shri Raj Narayan Biswas, CGM, CIL (Retd) - **Vice Chairman**
9. Shri Bhaskar Chakraborti, Dy D.G., GSI (Retd) - **Honorary Secretary**
10. Shri Ranjit Datta, Director, GSI (Retd)
- Organising Secretary
11. Shri Arunabha Das, Director, GSI (Retd)
- Hony Jt Secretary;
12. Shri S A Sufian. Dy D G, GSI (Retd)
- Hony Treasurer
13. Shri Ajoy Das, Sr G M, S B D P Ltd.
- Member

Regular Features

14. Shri Aminul Islam, Director, GSI
- **Member**
 15. Dr Biplab Mukerji, Dy D G, GSI (Retd)
- **Member**
 16. Shri Asish Kr Roy, Director, GSI (Retd)
- **Member**
 17. Shri Sajalendu Roy, CGM, CIL (Retd) -
Member
 18. Dr. Tapas Mallik, Director, GSI (Retd)
- **Member**
 19. Shri S. R. Khanna, GM (WBD),
CIL(Retd) - **Member**
-

Shri Bhaskar Chakraborti, the outgoing Hony Secretary & the impending Secretary of MGMI Calcutta Chapter, on behalf of past & present Executive Committee, expressed his sincere gratitude to all the members present in the AGM. He also thanked the President, Secretary & staffs of MGMI (Apex body) for allowing their office premises for holding the present AGM.

DISCLAIMER

The findings, interpretations, and conclusions expressed in any of the contributions of the MGMI News Journal is entirely those of the authors and should not be attributed in any manner to the Mining Geological and Metallurgical Institute of India (MGMI), to its branches or its members. The MGMI does not guarantee the accuracy of the data included in the publications and accepts no responsibility whatsoever for any consequence of its use.

Regular Features

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World's deadliest mine accident of this century

World's deadliest mine accident of this century happened in the Soma coal mine of Turkey in May as reported by the Mine News Website mining.com on June 11, 2018. The deaths were caused by a fire that swept through the coal mine in the town of Soma located 480 km south of Istanbul. The unfortunate accident claimed lives of 301 people. The deaths were product of the miners breathing carbon monoxide gas, which spread through the mine following the fire engulfing one of the pits. More than 160 other people could come out of the mine with serious injuries. The explosion and fire at the Soma coal mine not only became Turkey's deadliest mine incident, but the world's largest this century.

Inspection reports indicated that the coal had been smouldering for days before the disaster, releasing toxic gases.

The authority convicted five top mining executives over the worst mine disaster. The sentences, state-run Anadolu Agency reports, range from 15 to 22 years in prison for the top executives. The mine's general manager, Ramazan Dogru, was sentenced to 22 years and six months, as was technical manager Ismail Adali. The operations manager Akin Celik and technical supervisor Ertan Ersoy were both given 18 years and nine months. The verdicts were far less severe than those sought by prosecutors at the start of the trial. Nine other employees were handed shorter sentences, while 37 of the 51 defendants who had faced charges ranging from "killing with probable intent" to "criminally negligent manslaughter" were acquitted. Mining accidents are common in Turkey, where poor safety conditions have cost 3,000 lives since 1941.

The accident triggered mass protests over poor safety standards for mine workers as well as widespread criticism over how close the government was to industry bosses.

The disaster of the Soma coal mine of Turkey reminds the Dhori coal mine disaster of May 28, 1965 of Bermo coalfield near Dhanbad in India. On the fateful day, there was an explosion in Dhori colliery, which led to fire in the mine. The fire killed 268 miners. The mine was at that time privately owned by the Raja of Ramgarh. It is worth recapitulating the result of the findings and the recommendations made by the Court of Enquiry as under:

- Even in non-gassy mines, all workers below-ground should be provided with electric cap lamps.
- All the mining sirdars, shotfiringsirdars and overmen must be trained to detect the presence of methane in the mine atmosphere. Endorsement for gas-testing on the certificates of all the mining sirdars, shotfiringsirdars and overmen should be revalidated periodically.
- Some common precautions should be introduced in all the mines, gassy or non-gassy, especially in the working faces. Every mine must be required to test for gas in each working face and also in all places within a distance of say 100m, from the working face by means of a more accurate and more sensitive instrument than a flame safety lamp or by analysis of samples of air. This should be done by the manager or an under-manager.
- Even in non-gassy mines, steps should be taken to ensure better ventilation. Regular measurements of air should be taken in all mines.
- The distance to which a gallery can be driven "blind" must be enforced. Normally, it should be obligatory to make ventilation connections as soon as the gallery is driven a pillar-and-a-half length or 50 m from the last ventilation connection, whichever may be more.

The above recommendations brought out sea-change in comparison to earlier practices. Fortunately, there was no such devastating disaster any more caused by gas or coal dust explosion in coal mines so far in India.

- Bibhas Chandra Bhattacharya

ACHIEVEMENT OF MEMBERS

Congratulations and Best wishes



Serving more than 34 years in the Iron & Steel Sector **Shri Anil Kumar Chaudhary** has assumed the position of Chairman, SAIL w.e.f. 22nd September, 2018. Shri Chaudhary is an Associate Member of the Institute of Cost Accountants of India (ICAI) and the Institute of Company Secretaries of India (ICSI). He is also an alumnus of Faculty of Law and Faculty of Management Studies (FMS) under Delhi University, from where he completed LLB and PG Diploma in Personnel Management respectively. The Advanced Financial Management Programme from Royal Institute of Public Administration (RIPA), London and Specialised Management Programme from Management Development Institute, European School of Management are a few of the international programmes attended by him.

He has been a recipient of numerous awards from various Institutes and Bodies. Some of the most recent include Corporate Excellence Award in the area of Finance and Financial Management twice from the Institute of Public Enterprise, Hyderabad in 2012 and 2013, CMA-CFO of the Year Award, 2014 from the Institute of Cost Accountants of India, First Award at 12th National Award for Excellence in Cost Management-2014 and CFO Roll of Honor by CFO Institute in 2015 and 2016. During his tenure as Director (Finance), the Company has been conferred upon with the First Award for Excellence in Cost Management for the years 2014 and 2017.



Shri Rakesh Kumar, has assumed charge of the post of Chairman cum Managing Director of NLC India Ltd. (NLCIL) on 28-09-2018.

Shri Rakesh Kumar, is a Commerce Graduate with Master Degree in Business Administration in Finance. He joined NLC in 2012. Prior to his joining in NLC, he has associated with various important projects of BCPL and GAIL (a maharatna PSU) like HVJ Pipeline project, CNG Projects, Revival of Dhabol Power Project, Lignite and coal based thermal power projects, Renewable energy projects benchmarking using WACC and leveraging technology through ERP, E-procurement and E-banking, mobilization of resources including equity, debt (domestic as well as international market) etc. Presently he is heading the Finance Department of NLC and introduced various systems for effective control in Finance & Accounts, treasury and risk management, budgetary and cost control, tax planning, Corporate Governance etc. In recognition of his contribution made in the financial management, he has been conferred with ACHIEVERS AND LEADERS AWARD (FINANCE) and FINANCE LEADERSHIP AWARD. He has also been conferred with BT Star PSU Excellence Award for his outstanding contribution as Director (Finance) in PSUs of Maharatna/Navratna category. He has extensively travelled abroad including US, Europe and Japan.

Regular Features



Shri Prem Sagar Mishra
Chairman Cum Managing Director,
Eastern Coalfields Limited

Shri Prem Sagar Mishra is a B.Tech (Mining) from IIT (ISM) Dhanbad in 1987. He joined in South Eastern Coalfields limited (SECL) in 1987 and served there upto 2003 i.e more than 16 years and worked in different positions as Mining Engineer, Manager and Superintendent of Mines. There after he joined in Central Coalfields Limited (CCL) in October 2003 as Deputy Chief Engineer/Project Officer and worked there for about 5 years. He was

General Manager in Bharat Cooking Coal Limited BCCL for about 8 years. He was Director, Orissa Minerals Development Company Limited (OMDC) for about 3 years. In the meantime he did PGDBL, Business Law from West Bengal National University of Judicial Sciences. At present he is the Chairman-cum-Managing Director in Eastern Coalfields Limited (ECL). He is currently pursuing PhD from IIT (ISM), Dhanbad.

ATTENTION MEMBERS

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

Award & Medal Winners of 2017-18

Congratulations!

Dewan Bahadur DD Thacker
Coal Mining (Gold) Medal



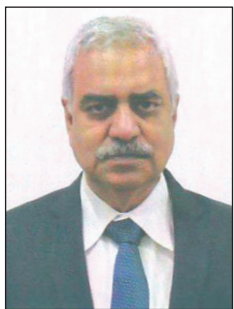
Dr Ajay Kumar Jha
Former CIL, IIT, Kharagpur,
International Centre of Excellence
(COE), EMIL, Aditya Birla Group,
CRD, Canada

Dr J Coggin Brown Memorial
(Gold) Medal



Prof (Dr) Om Prakash Varma
Executive President & Hony. Editor
Indian Geological Congress

Prof S K Bose Memorial Award



Prof B K Shrivastva
Coordinator,
Centre of Advanced Studies
Dept of Mining Engg. IIT, BHU

R P Bhatnagar Award



Dr Alok Tripathy
Scientist, Mineral Processing Dept.,
CSIR - Institute of Minerals and
Materials Technology, Bhubaneswar

Award & Medal Winners of 2017-18

Congratulations!

H B Ghose Award



Arun Kumar Das
Manager Sarisatolli Coal Mine
of CESE Ltd. Opencast Mine



Raj Kishore Singh
Manager, Gare Palma,
of Underground Mine of IV/G of Hindalco

John Dunn Medal



Dr Prabhakar Sangurmath
General Manager (Co-ord),
Hutti Gold Mines Co. Ltd

DN Thakur Award



Dr Tapas Kumar Mallik
Former Director Marine Wing, GSI

MGMI Chapter Membership Growth Award

MGMI Hyderabad Chapter

MGMI Chapter Activity Award

MGMI Ranchi Chapter

Award & Medal Winners of 2017-18

Congratulations!

Prof (Dr) Mahendra Pratap Singh
Memorial Coal Science Award



Dr Ashok Kumar Singh
Sr Principal
Scientist & Head of Research Group, CSIR

Lala Ramkishore Singhal Award



Dr Danda Srinivas Rao
Sr Principal Scientist, & Professor
AcSIR, CIMFR

Indranil Award



Dr Gadadhar Sahoo
Sr Manager, Physical Metallurgy Group,
RDCIS(SAIL)

Institute's Gold Medal

For the paper on
"Utilisation of Low Grade Chromite Ore
for the Production of Carbon Free Ferrochrome"

by

Prof (Dr) Rajib Dey,
Amit Kumar Bhandary,
Maharshi Ghosh Dastidar,
Siddhartha Mukherjee &
Mahua Ghosh Chaudhuri
Metallurgical and Material Engg.,
Dept. of Jadavpur University

Award & Medal Winners of 2017-18

Congratulations!

Institute's Gold, Silver & Bronze Medals

Gold Medal

For the Paper of
"Utilisation of Low Grade Chromite Ore for the
Production of Carbon Free Ferrochrome"

Dr J Coggin Brown Memorial (Gold) Medal for Geological Sciences

Prof Om Prakash Verma/

Dewan Bahadur D D Thacker Coal Mining Gold Medal

Dr Ajay Kumar Jha

Indranil Award for Metallurgy

Dr Gadadhar Sahoo

D N Thakur Award

Dr Tapas Kumar Mallik

John Dunn Medal

Dr Prabhakar Sangurmth

H B Ghose Award

Sarisatolli Coal Mine of CESC Ltd.
O/C Mine

Manager Shri Arun Kumar Das

Gare Palma IV/4 Coal Mines,
Hindalco Industries Ltd.
U/G Mine

Manager Shri Raj Kishore Singh

R P Bhatnagar Award

Dr Alok Tripathy

Prof (Dr) Mahendra Pratap Singh Memorial Coal Science Award

Dr Ashok Kumar Singh

Chapter Activity Award

Ranchi Chapter

Membership Growth Award

Hyderabad Chapter

Award & Medal Winners of 2016-17

Congratulations to all the students!

S Lal Award



Priyadarshi Suman
IEST, Shibpur

Kalyan Mukherjee "61 Geology" Medal



Sandip Choudhuri
University of Calcutta

La Touch Medal



Km Arpita Tripathi
IIT, BHU

La Touch Medal



Km Kuhoo Madhav
IIT, BHU

Award & Medal Winners of 2016-17

Congratulations to all the students!

Pickering Medal

Tejaswi Agarwal

IIT, Dhanbad (ISM)

Hayden Medal

Abhinav Kumar

IIT, Dhanbad (ISM)

Yule Medal

Ankur Varma

IIT, Dhanbad (ISM)

McNally Bharat Medal

Akash Chandra

IIT, Dhanbad (ISM)

Dr Hari Narain Medal

Vikas Kumar Jaiswal

IIT, Dhanbad (ISM)

Smt. Nirja Sahay Medal

Shri Sanket

IIT, Kharagpur

Oil India Medal

Shiok Rai

IIT, Dhanbad (ISM)

Indranil Award

Ms Priya Akshay Mehta

IIT, Kharagpur

Indranil Award

Ms Asmita Chakraborty

HEST, Shibpur

Chandrakala Medal

Abhisek Kumar

IIT, Kharagpur

SCCL Gold Medal

Gandhe Sai Kiran

Kakatiya University

Roberton Medal

Ms Khushi Sahu

IIT, BHU

Nava Bhrath Ferro Alloys Medal

R Sanjay Kumar

Kakatiya University

New Members

(As approved in Council Meeting on 18. 8. 2018)

As Life Member

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10793-LM, Shri Chandranath Banerjee, Advanced Engineer, Mineral and Separation Technology, Room No. 841, 'O' Block, Platinum City Peenya, Yeswanthpur, Bangalore 560022, Mobile: 9836615027, Ph: 08040449026 (O) /48521607 (R), Mail: chandranath.banerjee@mail.weir /chandramin@gmail.com

UPCOMING EVENTS

4TH INTERNATIONAL EXHIBITION AND CONFERENCE ON STEEL INDUSTRY

Federation of Indian chambers of commerce & Industry (FICCI) along with the Ministry of Steel is organizing the third exhibition of INDIA STEEL from January 22-24, 2019 at Mumbai Exhibition Centre, Mumbai.

Link: <https://www.indiasteelexpo.in/background.php>

INDIA STEEL 2019, January 22-24, 2019

4th International Exhibition & Conference On Steel Industry will be held 9 at Mumbai Exhibition Center, Mumbai, India. The International Exhibition and Conference is a joint initiative taken by the Ministry of Steel, Government of India and Federation of Indian Chambers of Commerce and Industry (FICCI) to provide a platform to all the Participants, Delegates, Business Visitors and other key decision maker from the Steel and other related industry to interact with, and explore new business avenues.

Link: <http://www.indiasteelexpo.in/>

FUTURE OF MINING SYDNEY, 25-26 March 2019

The Future of **Mining** conference, 25-26 March in Sydney addresses key strategic and operational questions from project and operations level management through to the boardroom. It will reveal the latest innovations and technologies which are driving mine productivity, mine efficiency and mine safety today.

Link: <https://australia.future-of-mining.com>

SPE Oil and Gas India Conference and Exhibition 9 - 11 April 2019

The sixth edition, themed "Driving India's Energy Future Excellence Through Sustainable Growth" will be held in Mumbai

Link: <https://www.spe.org/events/en/2019/conference/19ogic/oil-and-gas-india-conference-and-exhibition.html>

SDIMI CONFERENCE 2019 27 - 29 May 2019 Sydney, Australia

The Australasian Institute of Mining and Metallurgy (AusIMM) and the Australian Centre for Sustainable Mining Practices (ACSMP) at the University of NSW will jointly host the 9th International Conference on Sustainable Development in the Minerals Industry (SDIMI 2019).

Link: <http://sdimi.ausimm.com/>

PHYSICAL SEPARATION '19 June 13-14, 2019

Physical Separation '19 is organised by Minerals Engineering International (MEI) and is sponsored by Holman-Wilfley, Steinert & Wolf Minerals. Media sponsors are International Mining and the Coalition for Eco-efficient Commination (CEEC) are industry advocates. The conference will be held at National Maritime Museum, Falmouth, Cornwall, UK during June 13-14, 2019

Link: <http://www.min-eng.com/physicalseparation19/>

Upcoming Events

DEEP MINING 2019

The Ninth International Conference on Deep and High Stress Mining (Deep Mining 2019) will be held at the Misty Hills Conference Centre, Muldersdrift, Johannesburg on the 24th and 25th of June 2019. This series of international conferences has previously been hosted in Australia, South Africa, Canada and Chile.

Link: <https://deepmining2019.com/>

MIICE (JUL 2019), MINING INVESTMENT INDIA- CONFERENCE AND EXHIBITION...

2019 edition of Mining Investment India Conference and Exhibition will be held at Crowne Plaza New Delhi Okhla, New Delhi starting on 25th July. It is a 2 day.

Link: <https://10times.com>

MINING INDONESIA 2019, 21 September 2019

Mining Indonesia 2019 is Asia's largest international **mining** equipment exhibition and provides a professional platform for Indonesia's **mining** industry to do business. will be held at Jakarta International Expo Kemayoran, Jakarta, Indonesia.

Link: <https://www.mining-indonesia.com>

GROUND SUPPORT 2019, 23-25 OCTOBER 2019

Following on from previous symposia, the Australian Centre for Geomechanics team looks forward to hosting Ground Support **2019** in Canada. The International Ground Support Symposia have been a fundamental platform for advancing ground support excellence in **mining** and underground construction for more than 35 years.

Link: <https://www.groundsupport2019.com/>

#DISRUPT MINING CHALLENGE 2019-A MINING INNOVATION COMPETITION

The #Disrupt Mining challenge offers entrepreneurs a platform to bring disruptive and exponential technologies to the sector, whether it's unlocking exploration opportunities; finding operational and production efficiencies; reducing the environmental footprint and delivering on sustainability commitments; or developing alternative ways to finance mines and capital projects. #Disrupt Mining incentivizes people with exponential technologies and rogue ideas, with a CAD\$1 million capital opportunity to bring their disruption to mining.

Link: <https://disruptmining.com/>

News Update

Import Duty on Coking Coal

India's coking coal imports rose 13 percent in the 2017/18 fiscal year that ended in March.

India's steel minister Chaudhary Birender Singh expressed his concern over the constraints on the steel making in the country and wished that the finance ministry scrap the 2.5 percent duty on imports of coking coal, a key steelmaking raw material, to limit input costs.

Jumps in Gold Import

In August 2018 India imported 100ton of gold as international gold price fell. Such rising gold imports could widen India's trade deficit and further pressure its currency, the rupee, which hit a record low of 71.95 against the dollar recently.

NEWS UPDATE

Adani Group to produce more coal

The Adani Group is expecting to go for producing 80MT coal in another three years buying mines in countries such as Indonesia. It is also looking for getting more financing for its Carmichael mine in Australia amid challenges from environmental groups concerned about climate change and potential damage to the Great Barrier Reef. The company expects the rise of Thermal coal imports by more than 14 percent in the second quarter of 2018 from a year earlier may continue as railway infrastructure for coal evacuation from the mines may not be ready before 2022. The Group envisages increasing the capacity of coal handling at its operating port at Dhamra in Odisha to handle 80MT per year.



Carmichael would be Australia's largest coal mine

⁵ Image from report of Cecilia Jamasmie | Mar. 20, 2017 in MINING.com

NGT on Mining Environment Sand Mining in Bihar

Recently National Green Tribunal (NGT) Chairperson Mr Adarsh Kumar Goel has issued directives to Government of Bihar through the Secretary, Mines and Mineral, Bihar regarding sand mining in the Son and the Ganga river at Kolwar and Patna. Sand Mining during monsoon is a violation of the Sustainable Sand Mining Management Guidelines, 2016. At present no mining is permissible without proper planning and management and Environmental Impact Assessment.

Business Standard, August 29, 2018.

Illegal mining

NGT has directed State of Madhya Pradesh to work out the damages to the environment and the cost of restitution of the illegally mined area in the State. A committee comprising of nominee of Indian Council for Forest Research and Education, Dehradun, IIT(ISM), Dhanbad and Indian Institute of Forest Management, Bhopal will be submitting a report on the assessment of the cost of environmental mitigation. As per a court directive the States of Rajasthan, Himachal Pradesh and Karnataka also need to prepare reports of illegal mining, transportation and storage.

*India Environmental Portal,
August 28, 2018*

Hydrocarbon Exploration and Licensing Policy : A Boost for Petroleum Exploration

Atul Kumar Varma^{1#}, Santanu Ghosh¹

Hydrocarbon resources have emerged as an important energy source and have become an attractive object because owing to their huge resources. The Government of India has recently approved Hydrocarbon Exploration and Licensing Policy (HELP) in March 2016 in order to pull towards preferred level of investment in hydrocarbon exploration. The Government is advantageously progressing from the cost sharing model to the revenue-sharing model with marketing and pricing freedom for crude oil and natural gas produced by contractors under HELP regime. The new policy regime is supposed to invite more investment to raise exploration and production of oil and gas from both conventional and unconventional sources. Further, the HELP is proposed to improve bidding for designated areas throughout the year in a very clear and clean manner that is in line with the GOI (Government of India) goal of reducing the import dependency on oil and gas up to ~10% by 2022 and to promote ease of doing business in the oil and gas sectors in India. The new HELP will replace the earlier New Exploration Licensing Policy (NELP) that has been applicable since 1997-98. This policy, further, endeavours to enhance the domestic production of Petroleum as well as to accelerate the assessment of Indian sedimentary basins by offering investors a ready access to huge amount of Geoscientific data available in National Data Repository (NDR), and it also provides the flexibility to carve out exploration acreages through an open acreage licensing process and increased operational autonomy through a new Revenue Sharing model.

Main Features of HELP:

- (a) Single License (Unified License) for Exploration and Production of all forms of Hydrocarbons (conventional and unconventional Hydrocarbons).
- (b) An Open Acreage Licensing Program: allows bidders to have access to geoscientific data through National Data repository (NDR) for assessing the hydrocarbon prospective of any area and propose their own area (block) for bidding.
- (c) Transition from Cost Recovery Mechanism to a Revenue Sharing Mechanism
- (d) Marketing and Pricing Freedom for Crude Oil and Natural gas Produced.
- (e) Low regulatory burden.
- (f) EoIs (Expression of interests) can be made round the year with bidding rounds at six monthly cycles.
- (g) Exploration rights on all retained areas for full contract life.

Probable Positive Impacts of HELP:

- The new policy will enhance domestic oil & gas production. This may attract substantial investment in the sector and create substantial employment. The policy is also aimed at enhancing openness and reducing administrative preference.
- The Single License (Unified License) will allow the contractor to explore conventional together with unconventional oil and gas resources including coal bed methane, shale gas/oil, tight gas and gas hydrates under a single license. The

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concept of Open Acreage Policy will enable E&P (exploration and production) companies choose the blocks from the designated area.

- Present fiscal system of production sharing based on Investment Multiple and cost recovery /production linked payment will be replaced by a easy to administer revenue sharing model. The earlier contracts were based on the concept of profit sharing, where profits were shared between the Government and the contractor after recovery of cost. It became necessary for the Government to examine cost details of private participants under the profit sharing procedure and this led to many delays and differences. Under the new regime, the Government will not be concerned with the cost incurred and will receive a share of the gross revenue from the sale of oil, gas etc. This is compatible with the Government's policy of "Ease of Doing Business".
- Recognising the higher risks and costs involved in exploration and production from offshore areas, lower royalty rates for such areas have been provided as compared to the New Exploration Licensing Policy (NELP; a policy adopted by Government of India in 1997 indicating the new contractual and fiscal model) royalty rates in order to encourage exploration and production. A graded system of royalty rates has been introduced, in which royalty rates decreases from shallow water to deep-water and ultra-deep water. At the same time, royalty rate for on land areas have been kept untouched so that revenues to the state governments are not affected. Following the NELP, cess and import duty will not be applicable on blocks awarded under the new policy. This policy also provides for marketing freedom for crude oil and natural gas produced from these blocks. This is in step with the Government's policy of "Minimum Government Maximum Governance"

Advantages of HELP:

1. Exploration is allowed throughout the contract period.
2. Government is required to audit only the production and revenue by the exploring company.
3. No requirement for micro-management or control over budget and expenditure of the exploration company.
4. Minimum regulatory burden for the Government.
5. Enhanced transparency.
6. A significant reduction in administrative discrimination while granting greater freedom to the operator.
7. Ease of doing business.
8. A graded system of royalty rates has been introduced, in which royalty rates decreases from shallow water to deep-water and ultra-deep water.
9. Royalty rate for on land areas have been kept intact so that revenues to the state governments are not affected.
10. Exploration Phase for onshore areas have been increased from 7 years to 8 years and for offshore increased from 8 years to 10 years.
11. Uniform licensing for all hydrocarbons will support the potential investors in E&P because it removes the problem faced by current investors due to separate policies and licenses for different hydrocarbons.
12. Cess and import duty will not be applicable on blocks awarded under the HELP.
13. This policy provides for a uniform, non-discretionary framework for extension of contract in respect of Pre-NELP discovered fields. The extension will be granted for a period of 10 years both for oil and gas. During the extension period, it is proposed to increase the Government take by way of charging normal royalty and cess in place of concessional royalty and cess charged during the original contract period.

14. The profit petroleum during extension period will also be 10 percent higher than the normal percentage.
15. Marketing freedom for crude oil and natural gas produced from these blocks.
16. HELP is in line with the Government's policy of "Minimum Government Maximum Governance" and "Ease of Doing Business."
3. Hydrocarbon Exploration and Licensing Policy (HELP), Press Information Bureau, Government of India, Cabinet: <http://pib.nic.in/newsite/PrintRelease.aspx?relid=137638>
4. India's Hydrocarbon Exploration and Licensing Policy (HELP): Will it Help India's Upstream Oil and Gas? Energy Fact & Opinion: <https://www.csis.org/analysis/indias-hydrocarbon-exploration-and-licensing-policy-help-will-it-help-indias-upstream-oil>

Sources of Information:

Web References:

1. About Open Acreage Licensing Policy: <http://online.dghindia.org/oalpNew>
2. **Exploration Licensing Policy (NELP)**: https://www.ndrdgh.gov.in/NDR/?page_id=589
5. Thangaraj, S. and Velury, M., 2016. Advent of Hydrocarbon Exploration and Licensing Policy (HELP) & How it influences Investments in E&P. Imperial Journal of Interdisciplinary Research (IJIR). Vol-2, Issue-6, 141-146. <https://www.onlinejournal.in/IJIRV216/024.pdf>.

The members are requested to send contributions for the columns of the MGMI News Journal, like "Technical Articles" related to the mineral industry on topics dear to the members, Articles as Case History on various mine practices in the field, interesting write-ups for "Down Memory Lane", "Opinion" on burning issues of the mining industry, "Safety & Health" issues, research findings for "Technology Updates", etc.

Technical Article

Newly introduced Meghalayan period in Holocene epoch

Dr Anupendu Gupta *

The Geological Time Scale (GTS) pertaining to ~ 4600 Ma (million years) of earth's history is divided into four great chunks of time known as Eras: from the oldest to the youngest, they are the Precambrian (4600-500 Ma), the Paleozoic (500-250 Ma; meaning old life), the Mesozoic (250-65 Ma; middle life) and the Cenozoic (65 Ma - recent; recent life). These four Eras are further subdivided into numerous subgroups called epochs or systems, and sometimes more finely as periods, stages or ages.

The latest, Cenozoic Era is subdivided into Paleocene, Eocene, Oligocene, Miocene, Pleistocene and Holocene Epochs. The Pleistocene Epoch (1.8 Ma to 11,700 years BP i.e. Before Present) was succeeded by the Holocene Epoch, the epoch in which we live, starting from about 11,700 years ago to the present. Till recently the Holocene Epoch was subdivided into two periods - Greenlandian and Northgrippian.

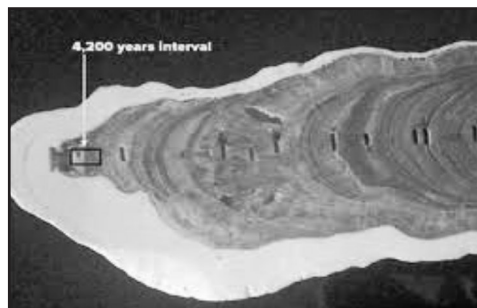
In July 2018, the International Commission on Stratigraphy (ICS) approved an additional Period in the GTS within the Holocene Epoch, the current stretch of geological time, called the Meghalayan. The name is derived from the northeastern state of India, where a stalagmite within a cave was found to hold the type evidence for a major global climatic incursion around 4,200 years ago. The International Union of Geological Sciences (IUGS) has also approved this subdivision on verification of the evidence from other parts of the world. This new addition is to appear in all official charts of the GTS, along with the pre-existing subdivisions of Holocene Epoch, partially modified the Greenlandian (11,700-8,326 BP) and the Northgrippian (8,326-4,200 BP), and Meghalayan (4200 BP - present).

The GTS, sometimes named after some type stratigraphic sections, stretches all the way back to Earth's formative years, and is a system that defines the timing and relationship of events that have occurred during our planet's 4.6-billion-year history. British names were more dominant GTS terms in the early period of its development but gave way to more global representation as geological

prospecting spread far and wide. For example, the Jurassic (named for rocks deposited 200 million years ago in which dinosaurian fossils were preserved) refers to some type of section reported from the Jura Mountains on the France-Switzerland border.

After the receding of continental scale ice sheets developed during Great Ice Age (1.8 - 1.0 Ma) of Pleistocene epoch, the global warming was set in. During Greenlandian period (11,700 - 8326 BP) there was a sudden outbreak of freezing temperatures within the Holocene, identified based on studies of ice cores recovered from Greenland and thereafter an overall warmer period continued during the Northgrippian period (8,326 - 4,200 BP). These events like the cooling and warming during Greenlandian and Northgrippian periods are relatively smaller climatic incursions in the Holocene, during an overall interglacial period, marked by receded glaciers after the Great Ice Age (GIA) of Pleistocene.

The recent coinage of the term Meghalayan for the late Holocene subdivision marks the beginning of a mega-drought that impacted large tract of the globe and affected several ancient societies as a 4200 yrs old event. The art of finding this golden spike on the stalagmite, a calcium carbonate column formed from water drops trickling down from cave roofs, depends on the ability to interpret the oxygen isotope values from precisely dated slices of the specimens (using the uranium-thorium method). The ratio of oxygen isotope reflects the ups and downs of rainfall, more the rainfall there would be less of oxygen-18 isotope in the sample.



*Former DDG, GSI

In a scientific paper published in 2012, geologists studied a high-resolution stalagmite oxygen-isotope record (spanning the early and mid-Holocene) from northeast India and suggested that the most dramatic of these events - i.e. shift in rainfall patterns - occurred about 4,000 years ago. They could conclude thus because the isotope amounts rose abruptly and remained at this level state with very high O_{18} for almost two centuries. This event appears to have been synchronous with climatic changes documented in a number of proxy records across North Africa, the Middle East, the Tibetan Plateau, southern Europe and North America. It is likely that these changes may have led either to the deterioration or the reorganization of the Nile, Mesopotamia and Indus valley civilizations.

The proposal to divide the Holocene Epoch into several smaller phases has been in the works for the last decade or so. Several formal bodies of geologists have whetted this proposal in the past before it could become part of the formal GTS scale. We the Indian geologists are excited to have an Indian nomenclature in the GTS for the first time.

Climate change is now a popular term but it is supposed to be associated with global warming caused by human activity. However, geological history shows us that the climate has warmed as well as cooled several times since the birth of the planet, motivated by celestial process. The Greenlandian cooling and Northgrippian warming for a few millennia, or even smaller both-way spikes for a few centuries like the Little Ice age (LIA) preceding the Medieval Warm Period (MWP) are both climatic incursions over very small slices of time. Such natural forces include changes in solar irradiance and changes in the orientation of the Earth in relation to its orbit. A combination of these factors led to a long ice age further back in time during Pleistocene Epoch.

It has also been suggested that the de-urbanization of the Indus Valley took place around 3,900 years before today, more as a consequence of the multiple monsoonal shifts before the rains returned to their stable mid-Holocene state. Jared Diamond, who analysed human societies in his book *Collapse* (2005), has written, "In many historical cases, a society that was depleting its environmental resources could absorb the losses as long as the climate was benign but then driven over the brink of collapse when climate became drier, colder, hotter, wetter or more variable."

As a consequence of the introduction of Meghalayan period marking a mega-drought at 4200 yrs BP (2200 BC), the archeological dating of Indus valley civilization known so far (2500 - 1750 BC) has to be pushed back by at least 2000 years or more (>4500 BC) for its advent and development and the end point of the civilization cannot be extended beyond 2200 BC, when it was devastated. It is well known now that besides Mohenjodaro-Harappa in Indus river valley (now in Pakistan) discovered in 1920, there are later archeological discoveries of innumerable locations of ancient habitations (Rakhigarhi, Banwali, Kalibangan, Ganwehwala, Chanhudoro, Dholavira, Lothal and many more) along a NE-SW-S line from Haryana, western Rajasthan to Gujarat. These habitations are considered to have developed along the lost course of Saraswati River, which is profusely referred in the old Indian scriptures. The experts on the basis of these new finds have named this ancient civilization as the Indus-Saraswati civilization instead of Indus civilization. With the geological identification of a global mega-drought in 4200 BP or 2200 BC, it is apparent now that the ancient civilization perished and the Saraswati river was lost due to desertification rather than due to devastating earthquake or flood, as was contemplated earlier.

Application of NMR Technology in Coal Mining Industry

***Ishaan Kapoor, **Jianliang Gao, ***Dr Khanindra Pathak**

Introduction

Nuclear magnetic resonance spectroscopy, most commonly known as NMR spectroscopy or magnetic resonance spectroscopy (MRS), is a spectroscopic technique to observe local magnetic fields around atomic nuclei. The sample is placed in a magnetic field and the NMR signal is produced by excitation of the nuclei sample with radio waves into nuclear magnetic resonance. The signal thereby produced is detected with sensitive radio receivers. The intermolecular magnetic field around an atom in a molecule changes the resonance frequency, thus giving access to details of the electronic structure of a molecule and its individual functional groups. The intermolecular magnetic fields are unique or highly characteristic to individual compounds. Therefore, NMR spectroscopy is increasingly being used as a definitive method to identify monomolecular organic compounds in modern organic chemistry.

Coal is one such organic compound and application of NMR studies in the understanding of coal properties can prove essential to India. Apart from coal, other hydrocarbons, such as CH₄, CO₂, etc. can also be studied well using NMR.

Henan Polytechnic University, Jiaozuo, China has a NMR Laboratory and main part of their work is focused on characterization of coal for a better understanding of Coalbed Methane (CBM). Samples from Jiuli Shan, Zhao Gu and Shan Xi Jincheng Wangtaipu Coalfield were being studied in between May 2018 - July 2018. The author was trained in these experiments as an intern during this period and this article reveals a brief introduction of the technology being used and conclusions are drawn from thereafter.



NMR Laboratory Setup, HPU, China

Nuclear Magnetic Resonance

Nuclear magnetic resonance (NMR) is a physical phenomenon in which nuclei in a strong static magnetic field are perturbed by a weak oscillating magnetic field and respond by producing an electromagnetic signal with a frequency characteristic of the magnetic field at the nucleus.[1]

NMR results from specific magnetic properties of certain atomic nuclei. Nuclear magnetic resonance spectroscopy is widely used to determine the structure of organic molecules in solution and study molecular physics, crystals as well as non-crystalline materials. NMR is also routinely used in advanced medical imaging techniques, such as in magnetic resonance imaging (MRI).

The Potential of C¹³NMR in Coal Research

An experimental research, performed by Retkofsky and Friedel[2] to study the coal properties using C¹³ NMR were the building blocks for all the future research on the topic and it successfully revolutionized the usage of NMR in the coal mining industry.

The high-resolution C¹³NMR spectra obtained during the course of the experiments, as in

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Retkofsky et. al. were of two types. Rapid passage dispersion mode C^{13} spectra were obtained using a Varian Associates V-43OOC high-resolution NMR spectrometer operating at 15.085 MHz. The observed spectra exhibited asymmetric peaks, which did not possess continuous baseline, and peak shapes and intensities were dependent upon the direction of magnetic field sweep.

The carbon-13 NMR results described by their research illustrated the first application of the technique to coal derivatives. It was thus concluded that the potential of the described techniques was unlimited and this research could prove a stepping stone for much more in the field of NMR in coal industry.

Attempts have been made in China to extend this study to coal and its properties in order to have a better understanding of the coal bed methane.

Coal Bed Methane

The Methane gas that remains adsorbed in the solid coal matrix in a virgin coal seam is called CBM. Usually referred to as '*sweet gas*,' because of the lack of Hydrogen Sulphide. CBM, as an alternative fuel is not only a more environment friendly option, extracting CBM from active seams also reduces chances of gas outbursts thereby making the operations safer.

Till April 2018, Coal India Ltd had to apply to the Ministry of Petroleum and Natural Gas for a license to extract CBM from its coal blocks (PTI, 2018). However, with the ease of imposed restrictions, the world's largest coal producer can aspire to extract more CBM without statutory hassles.

Coal Seam Properties and CBM

Understanding of the coal seam properties can offer us a great deal of information regarding the CBM concentration and further help us in devising methods to extract the gas from the seam. The key

parameters that control the CBM concentration are as follows:

- Porosity
- Adsorption Capacity
- Fracture Permeability

Various methods have been developed to study the adsorbed methane gas on the coal seams. One of the most accurate and modern technique is to use Nuclear Magnetic Resonance (NMR) spectroscopy. This method is especially prevalent in China and a lot of research is being conducted that revolves around quantifying the parameters that determine the CBM concentration. Yao et al. 2011, 2016, and Zhao et al. 2015 [3], [4], [5] came up with experiments to find the porosity, pore size distribution and the adsorption capacity of the coal sample.

NMR Based Characterization of Coal

To determine the properties of the coal sample we primarily measure the relaxation time. In nuclear magnetic resonance (NMR) spectroscopy and magnetic resonance imaging (MRI) the term relaxation describes how signals change with time. In general signals decays with time, becoming weaker and broader. Such decay reflects the fact that the NMR signal, which results from nuclear magnetization, arises from the over-population of an excited state. Relaxation is the conversion of this non-equilibrium population to a normal population. In other words, relaxation describes how quickly spins "forget" the direction in which they are oriented. The rates of this spin relaxation can be measured in both spectroscopy and imaging applications.

The two types of relaxation times measured are spin-lattice relaxation time (T_1) and spin spin relaxation time (T_2). For determining the CBM properties, the spin relaxation time (T_2) is primarily measured. In simple words T_2 is the time taken by

the magnetization vector to decay to 37% of its original value.

Conclusion

There is a significant interest at present in Chinese coal mines. The country has therefore invested a lot on improving the state of coal mines by extracting the CBM. This has not only helped China in becoming the 3rd most active nation in CBM extraction, but also the safety standards in the coal mines have also tremendously improved.

The use of NMR for the study of CBM is still in its nascent stages in India. If worked on properly it can provide us proper information regarding the CBM present in each seam, as well as can enable us to devise appropriate methods for the efficient extraction of the gas from these seams. A lot of work has already been done in understanding the parameters affecting the CBM concentration. NMR offers a novel, non-destructive method to garner more information on coal bed methane.

Acknowledgements

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References

1. D. I. Hoult, B. Bhakar, "NMR Signal Reception: Virtual Photons and Coherent Spontaneous Emission", *Concepts Magn. Reson.* 9, 277-297, 1997.
2. Retcofsky H. L., Friedel R. A. , U.S. Department of the Interior, Bureau of Mines Pittsburgh Coal Research Center, Pittsburgh, Pa, 247-253
3. Yao Yanbin, Liu Damneg, XieSongbin, 2015, Quantitative characterization of methane adsorption on coal using a low-field NMR relaxation method.
4. Yao Yanbin, Liu Damneg, 2011, Comparison of low-field NMR and mercury intrusion porosimetry in characterizing pore size distributions of coals.
5. Zhao Yixin, Sun Yingfeng, 2016, Pore structure characterization of coal by NMR cryoporometry.
6. Press Trust of India, "Govt relaxes rules for Coal India to ease coal-bed methane extraction" 2018, April 12, Business Standard.
7. Friebolin, H., "Basic One- and Two-Dimensional NMR Spectroscopy, 4th ed.," VCH: Weinheim, 2008. ISBN 978-3-527-31233-7
8. EIA. Annual energy outlook 2013; 2013.
9. D. I. Hoult, B. Bhakar, "NMR Signal Reception: Virtual Photons and Coherent Spontaneous Emission", *Concepts Magn. Reson.* 9, 277-297, 1997.

OBITUARY

DR BUDDHESWAR DAS

Dr Buddheswar Das, LM 2447 of 1973-74 expired at Edmonton, Canada on 5th March 2018. After graduating in mining engineering from ISM Dhanbad in 1956, Dr. Das obtained First Class Colliery Managers certificate in 1959 and worked for a number of years in different mines in Jharia Coal Field. After obtaining PhD in mining from Czechoslovakia in 1968 he migrated to Canada. He worked for some years as a Professor at Laval University and then switched over to a career in mining

research with CANMET, first at its Calgary complex and later at the Edmonton laboratory. Dr. Das was well known for his brilliance as a mining engineer and was well liked by all for his ever smiling, ego-less, down-to-earth nature.

Late Das was a Member of MGMI since 1973-74. With heartfelt grief MGMI Members wishes his soul to rest in peace in his heavenly aboard. May God give strength to his bereaved family members and friends to bear the loss.

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