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Mining Engineers' Association of India
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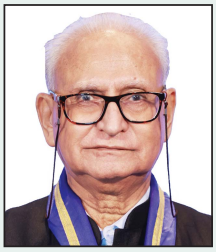

this issue contains...

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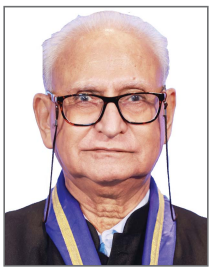
President's Message.....



The 8th Council Meeting and the 50th AGM of the Association were recently held at Ahmedabad wherein the new Council was installed for the two year term of 2023-25. In addition new Vice President III and the Jt. Secretary cum Treasurer were also installed. Appointment of new Nominated and Co-opted Council members with some Special Invitees are also notified recently. I welcome all these new Council members and hope that they will play constructive roles as a team in helping the Association attain new heights.

The AGM was followed by inauguration of the International Connference themed "Mining: Vision 2047," Thanks to Ahmedabad Chapter for organizing Council Meeting, AGM and the Inauguration functions in grand manner. The three-day conference provided an invaluable platform for industry professionals to exchange knowledge and insights. It successfully addressed the pressing challenges confronting the mining sector while exploring opportunities for technological advancement, resource optimization, and sustainability.

One very interesting part of the Conference was introduction of women and transgender as operators in mining fraternity by Tata Steel mines. It was an eye opener. After the day's schedule, the group of women and transgender who shared their experience met me expressing thanks for giving them opportunity and requested to take up the matter with other mining companies to give them similar opportunities, assuring that they will not disappoint such prospective employers. Now it is up to the larger mining companies to take initiative to bring the neglected class of the society into the mainstream and provide them opportunities to live respectful life.

Recently I was in Bhuj and had an opportunity to visit Govt. Polytechnic College and attended a meeting organized by the Students' Chapter there. Some very alarming facts were brought to notice during discussions, viz.

1. The adjoining Govt. Engineering College Bhuj, is running Mining Degree courses had only one regular faculty!

2. Kutch district has very large number of operating minor mineral mines in private sector, many of them are mechanized. But they don't give employment to Degree/ Diploma Mining Engineers and prefer to work with their trusted unqualified supervisors only. The regulatory authorities are unable to enforce employment of Mining Engineers and Statutory certificate holder supervisors, making mining unsafe which has resulted in few fatal accidents also.

3. As the most of these mines are mechanized and have deployed rock breakers, blasting operations are totally eliminated. Therefore the unqualified supervisors who wish to acquire statutory certificates don't qualify for these examinations for not being able to acquire experience in blasting operations.

The situation is quite alarming and concerned competent authorities need to look into the matter and resolve the issues. My earnest request to local MEAI chapter and its Local Centre is to take interest in these matters and follow up with authorities for some amicable long term solution.

S.N. Mathur
President

Mining Engineers' Association of India

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EDITOR'S DESK

Dr. P.V. Rao
Editor, MEJ

Excerpts of an interesting article '*Unlocking human creativity – people, technology and the changing role of organizations*' published by Bev Kubat, MAusIMM in the June 2023 issue of AusIMM Bulletin are shared below.

Mining has followed the trajectory of each of the industrial revolutions, and each advance has affected the way organizations manage their resources. Mining companies have at various times reached for the levers of cost reduction, productivity improvement and capital efficiency in order to find a competitive advantage. Often these levers have been deployed in a command and control style, where all-knowing leadership has focused efforts on cementing knowledge through the identification of best practice, an emphasis on efficiency and the assumption that replication is possible.

We are at the beginning of the fourth industrial revolution, which is characterized by system-wide innovation brought about by the interplay between digital, physical and biological fields. New tools are cheap, quickly scalable and accessible to all, meaning change and innovation is coming from more sources than ever. The pace and interconnected nature of change, and the resulting increase in complexity, means that one off organizational adjustments, targeting a well-defined solution, is no longer sufficient.

Instead, ***organizations will need to focus their effort on the process of continual response to an unfolding future*** if they want to realize the potential of technology adoption. This will require (i) paying attention to information that flows from actions, (ii) making sense of that information from the viewpoint of multiple perspectives, (iii) utilizing collective sense making to drive decisions, and (iv) ultimately, delivering adjusted action. This process is described as 'adaptive development', i.e. the ability to learn, change and become more advanced in response to changing conditions.

Adaptive development requires two forces to drive it viz. process of learning and process of change. The process of learning is acquiring new understanding that accumulates into knowledge. Learning first passes through the process of noticing information that emerges from our actions and then it proceeds to the process of sense making where we decide what that information means to us. In the process of change, we utilize the new knowledge developed to take action and, in so doing, accumulate knowhow. Change passes through the process of deciding based on the knowledge accumulated and then the process of doing, converting learning to action.

There are different levels of maturity in the adaptive development process that match the requirements of different levels of complexity that have emerged from the various stages of the industrial revolution. The four levels of maturity are silo, linear, collaborative and complex. Silo adaptive development focuses on the learning and change required within individual departments or elements of an organization. Focus is on compliance to known and understood practices. Linear adaptive development understands that there is a dependence between elements, but it tends to be thought of in terms of clear cause and effect with connection flowing one way. Collaborative adaptive development begins to recognise a more interconnected nature of elements in an organization, with cause and effect being less straightforward and operating in multiple directions simultaneously. Complex adaptive development starts to build a more nuanced view of the complex ecosystem that we operate in, paying attention to the subtle influences from a wide variety of elements both within and external to the system.

The ability for an organization to shift to a more complex level of adaptive development relies on the interplay between three levers: technology adoption, individual mastery and collective capability. Three categories of skills are required to support the development of each of these levers viz. Technical skills, Uniquely Human Skills, and our worldview. In the rapidly changing context of the fourth industrial revolution, the organization's role is to provide the conditions in which individual development can thrive while matching with the organizational objectives.

To shift the culture to one that supports an internal rate of change to match the rate of change demanded externally, the companies need to pay attention to diversity and inclusion, psychological safety, system thinking, transdisciplinary thinking, and participation of all. The shift in focus from individual achievement, control, efficiency and set outcomes to one that emphasizes context, process and collective learning and change will not be easy but for those in the increasingly complex mining sector that succeed, it will be rewarding.

- Editor

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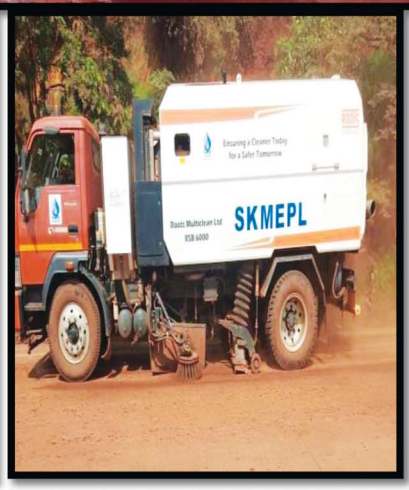

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NEWS FROM THE MINERAL WORLD

Coal India commits Rs 24,750 cr investment for 61 eco-friendly projects

Coal India Ltd has committed a capital investment of about Rs 24,750 crore in the next few years on as many as 61 first-mile connectivity (FMC) projects.

Coal India Ltd has committed a capital investment of about Rs 24,750 crore in the next few years on as many as 61 first-mile connectivity (FMC) projects in a bid to boost eco-friendly coal transportation.

In a statement, the world's largest coal producer said the projects, which will be set up in three phases, will have a combined capacity of 763.5 million tonnes per annum on completion.

FMC projects involve the transportation of coal in mechanized piped conveyors from production points to coal handling plants/silos with a rapid loading system where coal is loaded directly into rail wagons.

"It is essential that coal transportation is environment friendly to improve the quality of life of people living in the proximity of coalfield areas.

"FMC projects offer benefits like suppression of dust pollution and carbon emissions. They also reduce the load on road transportation leading to safety. Other benefits include precise quantity and quality coal is loaded for consumers with minimal manual intervention," said a senior CIL official.

As many as 35 FMC projects under the first phase having 414.5 million tonnes capacity account for Rs 10,750 crore. Of these, eight projects of 112 million tonnes capacity are already operational.

Press Trust of India, New Delhi / Sep 12, 2023

NMET has approved 309 mineral exploration projects so far: Government

As many as 309 mineral exploration projects with an estimated cost of Rs 2,100 crore have been approved by the National Mineral Exploration Trust (NMET) so far, an official statement said on Wednesday. The information was shared in a meeting of the Consultative Committee for Ministries of Coal and Mines to review the functioning of the NMET. Addressing the meeting, Union Coal and Mines Minister Pralhad Joshi said the Union government is extending substantial financial and technological assistance to state governments to further promote mineral exploration and make India self-reliant in mineral production, the statement issued by the Ministry of Mines said.

"It was informed that to boost mineral exploration, NMET has approved 309 projects with an estimated cost of Rs 2,100.14 crore for regional and detailed exploration in different parts of the country being carried out by various Notified Exploration Agencies and Notified Private Exploration Agencies (NEAs & NPEAs)," it said.

Of the 309 approved projects, 151 projects have been completed to date, while the rest are in progress, as per the statement. Besides mineral exploration projects, NMET is also funding projects for generation of baseline geoscience data, and funding the development of the National Geoscience Data Repository (NGDR) Portal of GSI. The National Mineral Exploration Trust (NMET) was established by the Centre to expedite mineral exploration in the country.

PTI / Sep 20, 2023

J'khand to restrict setting up of new coke units in Dhanbad to combat air pollution

In a bid to improve the air quality of Jharkhand's Dhanbad district, no new hard or soft coke units will be allowed there from October 1, a state pollution board official said on Sunday. The Jharkhand State Pollution Control Board (JSPCB) issued an order in this regard early this week.

"This is a temporary restriction, which will remain in force till the Air Quality Index (AQI) falls within the permission limit prescribed by the Central Pollution Control Board in Dhanbad district," JSPCB member secretary YK Das told PTI.

However, this order will not impact the existing hard or soft coke units of the district. "They will be operating as usual by following the compliance guideline," he said.

According to the order issued by the JSPCB, "The applications seeking Consent to Establish (CTE), which will be received till September 30, will be reviewed. If any error was found in them, the applications will be cancelled and no further action will be taken on those applications." According to the Industries and Commerce Association (ICA), Dhanbad, the district has around 125 hard coke and 25 soft coke units.

The ICA president BN Singh told PTI that the decision would not affect the hard coke units.

"The industry is already going through a bad phase due to non-supply of coal. Out of 125, merely 90 units are working currently," he said.

Dhanbad is among 102 non-attainment cities of the country picked by the Centre under the National Clean Air Programme in 2019 with a target of reducing concentrations of Particulate Matter (PM)-10 and PM-2.5 up to 30 per cent by 2024. Non-attainment cities are those that have poorer air quality than the national ambient air quality standards.

According to the CPCB website, the AQI reading of 184 was registered in Dhanbad on Saturday at 4 pm. The AQI 184 falls under the moderate category, which might cause discomfort to people with lungs, asthma and heart diseases.

Das said that even though the air quality of the district has improved in the past few years due to various measures taken by the board. "As part of further improvement in air quality, we have decided to restrict fresh establishment of hard and soft coke units. These units create major air pollution. However, the restriction is only applicable in Dhanbad district. This can be established in other districts such as Bokaro or Giridih," he said.

He further added, "The coal companies have strictly been asked to abide by the pollution rules. For this, a dedicated committee has been set up where representatives from district administration, Municipal Corporation and companies have been included. The committee from time to time takes stock of the compliance status of the coal companies." According to Airpocalypse-IV, an annual report released by Greenpeace India in 2020, Jharia, a part of the Dhanbad district, had recorded the country's highest PM-10 level at 322 ug/m3 (micrograms per cubic meter), while the same was recorded 264 ug/m3 in Dhanbad district, which was the second highest in the country.

Studies carried out by different agencies and JSPCB found that opencast mines, unscientific coal transportation, vehicular emission, road dust, air pollution from bio-mass burning, air pollution from industry, construction, diesel generator sets and use of coal in dhabas and roadside eateries as major drivers for worsening the air quality in Dhanbad district.

Das said that pollution fluctuates there depending upon the coal production and season. "When coal production goes high, pollution levels also rise. In winter and summer, pollution level increases, while it reduces in the rainy season," he said.

Pollution in Dhanbad has been a major issue for Jharkhand as well as the Central government. In 2010, Dhanbad had ranked 13 among 43 critically polluted industrial areas of the country. The next year in 2011, the Union Ministry of Environment had imposed a moratorium in Dhanbad to check pollution. The ban was lifted in 2014 after JSPCB introduced several measures to check pollution from hard coke and other industries.

In 2016, the World Health Organization (WHO) had placed Dhanbad in 38th position among the 100 world's polluted cities of the country. The Centre picked Dhanbad among 102 non-attainment cities under NCAP.

PTI / Sep 17, 2023

➨ **NTPC mining arm to explore battery minerals overseas: Report**

NTPC's mining arm will explore overseas sourcing of battery minerals such as lithium, cobalt and nickel, reported Reuters on Monday.

Indian power producer NTPC's mining arm will explore overseas sourcing of battery minerals such as lithium, cobalt and nickel, three sources told Reuters on Monday.

The South Asian country, among the world's top greenhouse gas emitters, has been pursuing pacts with other countries to secure key minerals in resource-rich countries such as Australia, Argentina and Chile. India aims to be a net zero emitter of greenhouse gases by 2070.

"We are keen to diversify into critical minerals, specifically lithium, nickel and cobalt," one of the sources in the company said. The sources did not specify which countries India will be talking to, to explore battery minerals sourcing.

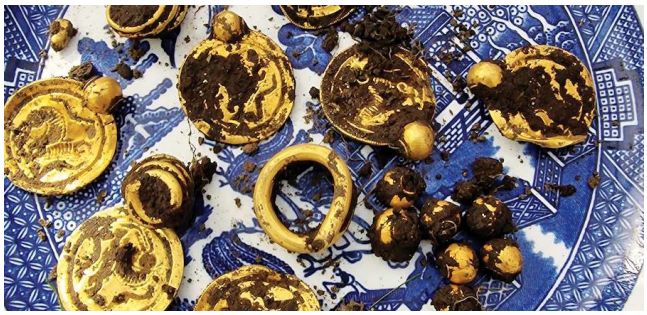
Reuters, New Delhi / September 18, 2023

➨ **Norwegian metal detectorist hits the "find of the century"**

A metal detectorist recently discovered nine coin-like gold pendants engraved with rare horse symbols, along with 10 gold beads and three gold rings that were buried 1,500 years ago on the Norwegian island of Rennesøy.

"I had been searching along the shore but only found scrap metal and a small coin. So, I decided to explore

the higher ground, and the metal detector immediately started beeping," Erlend Bore (51), who purchased his first metal detector before the summer, said in a media statement. "At first, I thought I had found chocolate coins or plastic pirate treasure. It was surreal."



The 6th-century gold treasure discovered by metal detectorist Erlend Bore in Rennesøy. (Image by Erlend Bore, Museum of Archaeology, University of Stavanger).

Researchers at the Museum of Archaeology, University of Stavanger, deemed this as "the find of the century in Norway." Discovering such a significant amount of gold – about 100 grams – at once is extremely rare in the Nordic country.

According to Håkon Reiersen, associate professor at the Museum of Archaeology, the gold pendants date from around AD 500, during the Migration Period in Norway. These gold pendants, known as "bracteates," resemble gold coins but were used primarily as jewellery, not for buying or selling goods.

"The nine bracteates and the gold beads would have formed an exceptionally splendid necklace, which was crafted by skilled goldsmiths and worn by the most powerful individuals in society. Finding so many bracteates together is exceedingly rare. This is the first such find in Norway since the 1800s, and it's also an uncommon find in a Scandinavian context," Reiersen said. The expert pointed out that many of Scandinavia's major bracteate finds were buried in the ground during the mid-500s, towards the end of the Migration Period, which likely marked a crisis with crop failures, worsening climate and plagues. "Based on the location of the discovery and findings from similar contexts, these were most likely either hidden valuables or offerings to the gods during that dramatic time," Reiersen said.

Hardship and healing

The gold pendants from Rennesøy belong to a specific type that is considered extremely rare. They depict a horse motif in a previously unknown form. "These motifs differ from those on most other gold pendants found so far. Typically, the symbols on the pendants depict the god Odin healing the sick horse of his son Balder. During the Migration Period, this myth was seen as a symbol of renewal and resurrection, believed to offer protection and good health to the wearer," said Sigmund Oehrl, an expert on bracteates and their symbols at the Museum of Archaeology. The Rennesøy bracteates, however, only depict the horse. A somewhat similar horse motif, along with serpent-like creatures, can also be found on a couple of gold bracteates discovered in Rogaland and South Norway. "On these gold pendants, the horse's tongue hangs out, and its slumped posture and twisted legs suggest that it is injured. Similar to the Christian symbol of the cross, which was spreading in the Roman Empire at the same time, the horse symbol represented illness and hardship, but also hope for healing and new life," Oehrl noted.

Staff Writer, Mining.Com | Sept 13, 2023

How sensor-based sorting testing can take the guesswork out of ore processing

As sensor-based sorting technologies evolve, SRC is expanding its service to provide test work solutions for the future needs of the mining industry. Credit: SRC

Sensor-based sorting (SBS) is a collection of technologies that separate particles or parcels of ore and waste based on mineralogical differences that sensors can detect.

While not suitable to every project, SBS technologies can address many of the economic and environmental challenges faced by the mining industry, lowering energy costs and emissions, says Lucinda Wood, business development director for the Saskatchewan Research Council's (SRC) Mining and Energy Division.

"Sensor-based sorting is a reliable and efficient way to upgrade or remove waste from further downstream processing," she says. "If you can reduce the amount of material going to the mill, that reduces energy costs and tailings at the back end of the process."

Particle sorting (also called ore sorting) separates coarse ore particles (10-100 mm in width) using sensors

and mechanical separation using air ejectors. Whereas bulk sorting detects the characteristics of whole ore particle parcels and can then separate these parcels from each other with a range of separation techniques, such as deviation of a conveyed feed on a belt.

While there is a variety of technical options to choose from, the SRC can help mining companies navigate their sorting options by offering technological insight and processing expertise based on its 75 years of service to the mining industry.

SRC also helps companies navigate the test work needed to identify and optimize sorting applications. Based on the need for common test work methodology, SRC is at the forefront of developing standardized methods to assist companies and consulting companies with this.

Long history of sorting technologies

SBS technologies have been in use for nearly 100 years, and go back to 1926 when American inventor Andrew Sweet first filed a patent for technologies that could separate ores using sensitive sensors. They picked up changes in colour or the amount of light reflected from different minerals and metals.

Over the past decades, advances in SBS technologies have rapidly commercialized, increasing the speed and accuracy at which sensor data is processed. This has enabled near real-time and automated separation and has made it a valuable tool for the mining industry.

SRC's Diamond Laboratory has been using sensor-based technologies like luminescent sorting for decades. Over the past few years, the lab has adopted X-Ray transmission (XRT) sorting technologies, which sort minerals by their unique atomic signatures.

Centralized source for sorting services

SRC has designed a testing regime to assist industry clients with choosing the right SBS technology for their needs. The regime starts with sensor-based mineral characterization, then targeting and modelling, and finishes with pilot-scale testing.

"We provide geochemical and mineralogical data for mining and exploration companies for many different commodities, such as uranium, gold, base metals, potash and rare earths," says Rob Millar, manager of SRC Geoanalytical Laboratories.

SRC's full suite of minerals liberation sorting services is based on expertise and technologies from across its facilities, such as SRC Geoanalytical Laboratories, Diamond Laboratory and Minerals Processing. This creates a "one-stop-shop" that serves a mining company's sorting needs for any ore sorting technology.

Stage 1: Sensor-based mineralogical characterization
In the first stage, a specialized sensor-based mineralogical characterization service assesses the type of technology and the amenability of ores to SBS technologies, based on the specific mineralogical characteristics of each ore. This allows companies to determine the optimal sensor technology at the optimal size and the information will eventually lead into modelling and total circuit design for processing these ores.

"Mineral characterization is the process of identifying, measuring and quantifying a mineral's response to different sensors," says Jane Danoczi, a senior process engineer in SRC's Mining and Energy Division. "With that information, you can identify what sensors will work with what ore."

The distinct physical and chemical compositions of ore elicit different responses from different sensors, so a strong understanding of individual ore mineralogy is crucial to the successful adoption of SBS technology.

It is not only important to understand the mineralogy and sample grades, but also the textures of these minerals, the volumetric proportion of the minerals relative to others at different sizes and the levels of dissemination and whether they are heterogenous at certain size fractions and can be sorted.

"With sensor-based sorting, you have to look at each fragment or particle and its complexity to see how to sort, but now we have a metric that can quantify this complexity and predict how it will respond to a sensor," Danoczi says.

Using the trademarked Homogeneity Factor method developed by Danoczi's team, the sortability at different size fractions by different sensors can more rigorously be determined in a methodological way.

This unique method assesses a particle's complexity by rating it on a scale between positive 100 and negative 100. The higher the value, the easier the ore particle is to identify and sort. A low value like -90, for example, means the fragment is not homogenous with respect to the target mineral assemblage and will be more difficult for the sensor to sort.

These results lead to potentially different sorting options – based on different target minerals (not only desired metal, but also waste or associated minerals) – that can be successfully detected by sensors at sortable size ranges.

Stage 2: Targeting and modelling
The next stage — targeting and modelling — helps clients decide on a desirable sorting strategy (i.e., which mineral, which size and which sensor) and then create a semi-empirical model with sorter data and start scaling up the test work to develop.

Clients can use the valuable modelling information to test out various scenarios in the design phase for their operation. The model is developed by SRC experts through sorting first and includes inspection tests, models and algorithms.

Stage 3: Pilot testing
The final stage — pilot testing — allows clients to obtain refined algorithms and an understanding of sorting yields and recoveries, as well as general performance of the full circuit. This phase is important in determining the feasibility and capital costs of a sorting project.

An interdisciplinary approach for reliable results

SBS technologies rely on the integration and cooperation of many specialties, including geologists, mineralogists, physicists, minerals processing engineers and chemists, and specialists in algorithm development and artificial intelligence.

The complexity of SBS brings some challenges to the table, including how it can be used at mines. Danoczi says that with declining ore grades and more complex mineralogy, industry is starting to recognize the potential of SBS, which reduces energy and reagent requirements as well as overall carbon footprints.

"Clients are seeing the necessity for sensor-based sorting to actually get their ore out of the ground or stockpiles and process it efficiently," Danoczi says. "With sensor-based sorting you benefit both the mines and the planet."

MINING.COM and Saskatchewan Research Council / Sept 20, 2023

Indian, Canadian officials discuss critical mineral mining cooperation

A top Indian minister held talks on boosting critical mineral mining cooperation with Canadian officials on Monday, the Indian government said, amid tense diplomatic relations between the two countries.

India's Coal and Mines Minister Pralhad Joshi "resolved to strengthen the supply-chain of critical minerals" in talks with Ranj Pillai, the premier of Canada's Yukon Territory, the government said in a statement.

The statement did not specify the critical minerals under discussion, but mentioned that Yukon's leading mineral resources include lead, zinc, silver, gold, asbestos, iron and copper.

Indian Prime Minister Narendra Modi raised strong concerns about Sikh protests in Canada with Canadian Prime Minister Justin Trudeau on the sidelines of a G20 summit in New Delhi earlier this month.

For its part, Canada paused talks on a proposed trade treaty with India. Canadian Trade Minister Mary Ng also is postponing a planned trade mission to India.

Reuters / September 18, 2023

US gov't mulls 50-year mining ban in New Mexico

US Gov't pushes 50-year mining, oil drilling ban in New Mexico.

Reference image of Kasha Katuwe Tent Rocks National Monument in New Mexico. (Stock photo by eickys.)

The US government is proposing to ban mining and oil drilling in northern New Mexico for up to 50 years, as part of the Biden administration's ongoing efforts to protect Native American lands and promote responsible mining in public grounds.

According to the Department of the Interior (DOI), the proposal would ban new mining claims, as well as oil and gas development across more than 4,200 acres within the Placitas area in Sandoval County.

"We're responding to call from Tribes, elected leaders, and community members who want to see these public lands protected," Interior Secretary Deb Haaland said in the statement. "We look forward to hearing more from the public to inform decisions about how activities, like gravel mining, may impact these lands, including the important cultural and natural resources."

The announcement marks the beginning of a 90-day public comment period to gather input on the proposal. Policymakers and local communities have long advocated for protection of the area, considered

(Continued on Page 21)

DETERMINATION OF IN-SITU BLOCK SIZE ON BLAST INDUCED ROCK FRAGMENTATION- A REVIEW.

A.G.Sangode[1, 2], A.K.Raina[1] and K. Ram Chandar[2]

Abstract

The in situ block size and of rockmass discontinuities have a significant role in several types of projects that involve rock engineering. These include the stability of the blocks and their behavior to the inevitable loads in underground excavation of civil or mining, tunneling projects, slope stability in mining, highway cutting operations and for designing an appropriate blast pattern, also. The in situ rocks or rock mass contains structural discontinuities or joints. The geometric configuration of three or more such joints in space defines the rock blocks. Methods for predicting the in situ block size that are in vogue are presented in this paper that include estimation of in-situ block size and blast induced fragmentation relations using physical measurements, digital image analysis techniques and existing models . This paper reviews the existing in situ block size estimation in rockmass.

Keywords: *Rock mass, in situ block size distribution, modeling*

1. INTRODUCTION

Blast fragmentation is an important considerations in the Mine-Mill Fragmentation System (MMFS) as the fragment size, generally expressed in terms of mean fragment size, influences the downstream performance of the system. One of the major rock variables in blasting is the in situ block size which is reduced further in the process such breakage. The in situ block size distribution (IBSD) and blasted block size distribution (BBSD) can provide a basis for the energy consumed in the fragmentation process. Accordingly, determination of IBSD is an important consideration in blasting and is the main focus of this work in the fragmentation due to blasting.

1.1 In situ Block Size

The geological discontinuities like joints present in the rockmass thus define the in situ block size and has a direct relationship with the blasting results. The rock face is non-homogenous and traversed by planes of weakness and micro fractures in the field blasting. In general, joints are the most common discontinuities which occur in nearly parallel sets. Discontinuity joints are often assumed to consist of parallel laterally displaced separate joint (Bhandari, 1974; Olson & Pollard, 1991)

The in situ block size is a key parameter in any surface mining operation including rockmass classification, drilling, and blast design. The natural i.e., in situ block size plays an important role in many rock engineering projects. It is examined in mining and quarrying blast operations (Cunningham, 1982; Wang et al., 1991) in rock mass characterization (Franklin JA & Katsabanis T, 2018; ISRM, 1978) stability analysis of excavations in jointed rock masses (Evert Hoek and John Bray., 1981). In any surface mine, the in situ block size defines the fracturing of the rock mass and it is a measure for the degradation of the rock mass strength (Kluckner et al., 2015)

The intersection of discontinuities or fractures within a jointed rock define the individual blocks of intact rock within the

surrounding rock matrix (Figure 1a). The range of sizes of such blocks is represented in the form of in situ block size distribution, IBSD in Figure 1(b)

The in situ block sizes are further reduced during blasting as a result of rock breakage during the process. It is expected that the IBSD has a relationship with the BBSD. This relationship, if defined in proper terms, is expected to provide a measure of energy consumption in fragmentation during blasting.

1.2 Need of In situ Block Size in Blast Fragmentation

The fragmentation ,an important aspect of bench blasting in the surface mining is generally rock fragmentation is expressed in terms of mean fragment size (k_{50}) and the distribution function defined in terms of its characteristic size (k_c *or* $k_{0.693}$) and Uniformity index (n) that represents the slope of the function and assumes a Weibull distribution. Blast fragmentation dictates the mine production as it has direct effect on the drilling and blasting cost (Jimeno et al., 2017) and impacts the performance of MMFS (Hustrulid, 1999) plan and unit operations. With typical engineered blasting solutions, a characteristic fragment size is calculated and

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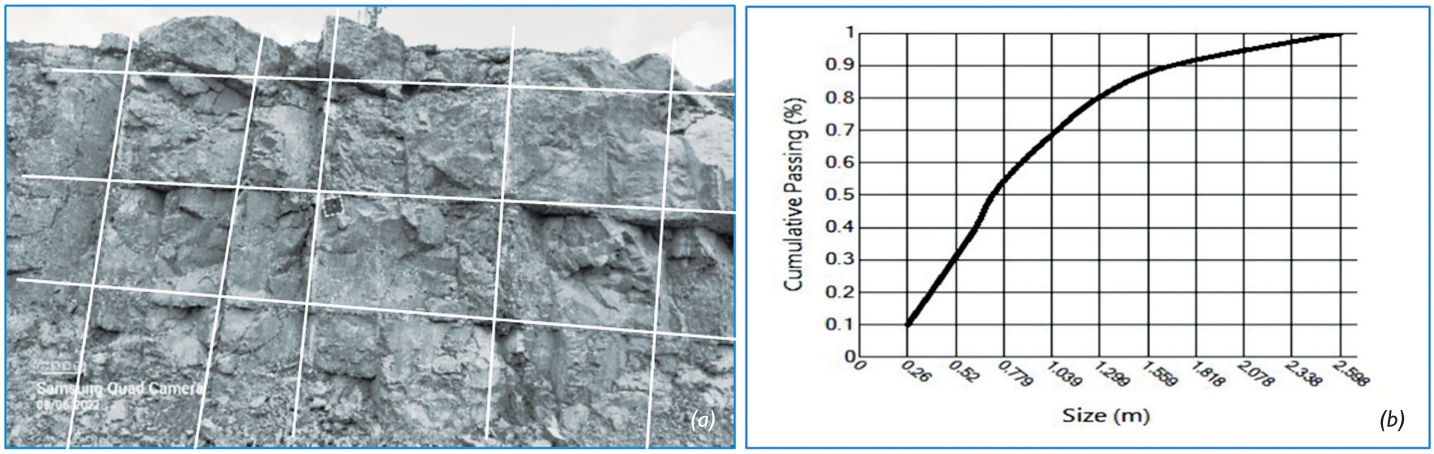

Figure 1:(a) In situ block size in mine bench, (b) in situ block size distribution

a distribution coefficient is applied to describe the extent of fragment sizes of a muck pile. These are usually based on the Rosin-Rammler distribution curve (a form of Weibull distribution), one of the most common means of describing muckpile fragmentation.

The efficiency of all the subsystems of MMFS are dependent on the size of the rock fragmentation (Mackenzie AS, 1966) drilling and blasting are critical in determination of optimum rock fragmentation as well as to minimize the entire cost of the mining operations (Kanchibotla, 2003). If rock fragmentation is not controlled, then the production cost increases due to unnecessary secondary blasting. On the other hand, very fine fragmentation decreases the value of the ore. Hence, mid-size fragmentation is a pre-requisite to the MMFS. Thus, blast design should take into account the findings of rock fragmentation to cut down the mining cost and shorten the working time. In open pit mining, drilling, and blasting represent 15 to 20 % of the total mining cost (Da Gama, 1977) that means around 80% costs are associated with the downstream mechanical process. Accordingly it is prudent to focus on performance of such unit operations that are dictated by drilling and blasting operations.

2. Historical Review

Over the last two decades, the research has contributed large data on in situ block size estimation strategies, prediction approach and measurement of fragment sizes in blasted muckpile (BBSD). A detailed literature review is carried out and presented in the form of Table 1 to Table 3 revealing that the literature can be classified into the different categories viz.

1) In situ block size estimation strategies in the global scenario.
2) Empirical Prediction for estimation of IBSD approaches.
3) Direct measurement from blastpile images of fragmentation (BBSD) and their relationship with IBSD.

2.1 In situ Block Size Estimation Strategies

Several estimation methods of IBSD have been proposed by such as determination of the Block Size Index methods (Franklin JA & Katsabanis T, 2018; ISRM, 1978) a simulation methods (Priest & Hudson, 1976) and a computational method (Da Gama, 1977; Wang et al., 1991). Notable developments in the estimation of IBSD are the works carried out by Wang and his co-workers (Wang et al., 1991), who developed two techniques of predicting the in situ block size and shape parameters. The first method Dissection Method, which uses a computer program to determine the sizes and shapes of all blocks produced by intersecting discontinuities within a boundary block formed by six planes. The second is the so-called Equation Method, which uses a set of empirical equations to estimate the IBSD.

The development of methods to predict IBSD and related parameters has been described extensively in the literature. (Da Gama ,1977) implemented a computer algorithm to determine the volumes of in situ blocks based on persistent representations of individual joints mapped in the field. (Al-Thyabat & Miles, 2006) examined the partitioning of space via 'sets' of discontinuities, considering several geometric configurations of infinite planes which were randomly oriented. (Priest & Hudson, 1976) related his work to more typical geological geometries involving three mutually orthogonal sets of persistent discontinuities. (Wang et al., 1991) developed an algorithm to predict the volumes of blocks based on daylighting joints using the block theory developed by Goodman, (1985).

A matrix connectivity method was used by (Li et al., 2006) to study the effect of orientation dispersion on IBSD for three orthogonal joint sets. They concluded that as little as 10-degree dispersion in pole vectors was sufficient to result in curvature of the resultant IBSD. (Maerz & Germain, 1996) used a software package to study IBSD for some simple scenarios. Their algorithm was limited to using three sets of persistent joints. (ISRM, 1978) recommend such use of 3 joint

sets in defining the in situ block sizes & their distribution. It is their by assumed that minor joints do not influence the IBSD in a significant manner. (Lu & Latham, 1999) used equation-based methods to study the effect of spacing distribution on IBSD. Their analysis was limited to three joint sets and accounted for persistence indirectly, but they concluded that spacing distribution was an important factor.

(Wang et al., 1991) provided a sophisticated software implementation of an algorithm designed to handle any number of discontinuities sets and indirectly account for persistence (assuming a persistence-spacing relationship). Their algorithm randomly chose discontinuities from previously generated discontinuity 'database'(Elmouttie & Poropat, 2012) and checked for the possibility of formation of polyhedral rockmass (Ahn & Lee, 2004) attempted to account for non-persistence via analogy with the 2D geometries (Jern, 2004) developed an equation based on the product of spacing distributions for three orthogonal sets.

(Latham et al., 2006) expanded the use of equation-based methods (Wang et al., 1991) to account for persistence and spacing distributions for three orthogonal sets.(Roger, 2007) described the use of discrete fracture networks (DFNs) consisting of polygons accurately reflecting the finite persistence of joints and other structures. Their algorithm utilized the simulated 2D trace map forming on the exposure (e.g. underground cutting), identifying closed polygons on this map, and iteratively interrogating the trace maps associated with the fractures responsible for each segment of the polygons until the minimum-volume polyhedral were identified.

(Kim, 2011) utilized a commercially available polyhedral modeler to analyze IBSD for three orthogonal sets of semi-persistent (i.e., persistent in one direction) discontinuities. They concluded that the derived IBSD for several spacing and orientations are log-normally distributed. This review outlines the progressively more sophisticated approaches to the estimation of IBSD.

The International Society for Rock Mechanics (ISRM, 1978) outlined a number of parameters for geometrical, mechanical, and hydraulic characterization of discontinuities, including orientation, spacing, persistence/trace length, roughness, aperture, wall strength, filling, seepage, number of sets, and block size. However, three geometric parameters, and their spatial distributions, are most important in the estimation of IBSD that measured spacing distributions, trace length distributions and orientation distributions. Some major contributions in the field of IBSD measurements are summarized in Table 1and some useful formulae for calculation of IBS are given in Table 2

2.2 Prediction Approaches for Blasted Fragment Sizes

There are several models in vogue for determination of the blasted fragment size. Some of these are purely empirical in nature while as direct measurement methods have taken front stage in recent researches.

The Kuz-Ram model

(Kuznetsov,VM 1973) studied different materials with widely varying types of blasting scales ranging from normal open pit mining to a nuclear blast. Based on the measurements of fragmentation from the studies, he proposed an empirical equation used to estimate the *50%* passing block size of a blast pile, which is given by Eq.1

$$k_{50} = A\left(\frac{V_b}{Q}\right)^{4/5} Q^{1/6}\left(\frac{115}{E}\right)^{19/30} \quad \text{Eq. 1}$$

where k_{50} represents a sieve size (in *cm)* through which *50%* of the blast pile will pass; *Q* equals the weight of explosives (in kg), and, V_b, is the volume of rock mass per blasthole (in m^3); *E* is relative weight strength of the explosive, taking *E*=100 for ANFO; *A* is a rock factor which is dependent on the description of the rock mass in terms of discontinuity structure, rock density and rock hardness. Originally, (Kuznetsov, 1973) suggested that *A* take one of the following values: (i) 7 for medium rocks; (ii) 10 for hard, highly fissured rocks; and (iii) 13 for very hard, weekly fissured rocks.

Combining the Ros-Ram equation (see Eqn.2) with Kuznetsov's equation, (Cunningham, 1982) suggested an empirical approach to estimating fragmentation. This approach has been called the "Kuz-Ram" model. In the Kuz-Ram model, the characteristic size in the Ros-Ram equation is derived from *Sb50* obtained by the Kuznetsov equation, the uniformity index *n* characterizing the steepness of the Ros-Ram curve is estimated by Eq.2

$$\mathrm{n} = (2.2\text{-}14\frac{B}{d})(\frac{1}{2}(1\frac{S}{B})^{0.5}(1-\frac{W}{B})\frac{(BCL-CCL)}{L}+0.1)^{0.5}\frac{L}{H} \quad \text{Eq.2}$$

where *d*is blasthole diameter (mm), *B* is burden (m), *S* is spacing (m), *BCL (m)* and *CCL* (m) are respectively bottom and column charge length, *L* is total charge length (m), *W* is the standard deviation of drilling accuracy (m), and *H* is bench height (m). developed an algorithm for the value of *A* with reference to the research of (Lilly & Peter A, 1986). It attempts to improve the values of *A* originally suggested by (VM Kuznetsov, 1973) and is given by (Eq.3&4)

$$A = 0.06(RMD + JF + RDI + HF) \quad \text{Eq.3}$$

$$JF = (JCF\ X\ JPS) + JPA \quad \text{Eq.4}$$

where *RMD is* the description of rock mass, *JF is* the discontinuity factor, *RDI* is the rock density influence, *HF* is hardness factor, *JCF* represents discontinuity condition, *JPS* is the vertical discontinuity spacing, and *JPA is* the

Table 1: IBSD prediction methods

Author	Method	Variables considered
Miles (1972)	Partitioning of space via "sets" of geological discontinuities.	Orientation sets
Da. Gama (1977)	Computer algorithm to determine volume of in-situ blocks	Persistence
Hudson & Priest (1979)	Distinctive geological geometries involving three mutually orthogonal sets of persistence.	Orientation sets of persistence.
Goodman & Shi (1985)	Block Theory	Volume of block (Spacing & persistence)
Wang et.al (1991)	Algorithm to predict volume of block based on delighting joints using block theory	Orientation of joint sets
Young et.al (1995)	(Matrix connectivity Method), Effects of orientation dispersion on IBSD for three orthogonal sets	Orientation of joint sets
Maerz & German (1996)	Software package for IBSD	Three joint sets of persistence.
Lu and Latham (1999)	Equation based method to study the effect of spacing distribution on IBSD	Spacing
Wang et.al (2003)	Software (algorithm design to handle number of discontinuities sets with persistence.	Any numbers of joint sets of persistence and spacing.
Ahn & Lee (2004)	Attempted to account for non-persistence via analogy with two-dimensional geometries.	Spacing
Jern (2004)	Equation based on the product of spacing distribution for three orthogonal sets	Spacing
Latham et.al (2006)	Equation based method described in Wang et.al (1991) to account for persistence and spacing distribution.	persistence and spacing
Roger's et.al (2007) Kim et.al (2007)	Discreet fracture networks (DFN) consisting polygon. Polyhedral modeler to analyze IBSD for three orthogonal sets of semi-persistent joints.	Spacing and Orientation
Raina et.al (2009)	Fragalyst V3.0 (Software package for IBSD)	Three joint sets of persistence. spacing
M.K. Elmouttie & G. V. Porapat (2012)	Possibility of formation of polyhedral blocks in rockmass	

Some useful formulae for determination of in situ block sizes of rockmass are given in a *Table (2).*

Table 2: IBS Prediction models

Author	Empirical Relation
Barton,1988	$\frac{RQD}{Jn}$; *Equivalent block volume*
Palmstorm, 1982	$Vb_0=\frac{S1.S2.S3}{\sin\gamma1.\sin\gamma21.\sin\gamma3}$
Cai et.al,2004	$\frac{vb}{Vb0}=\frac{1}{3\sqrt{P1.P2.P3}}>1$
Wang,et al 1992	$Vip=\frac{cip(spm1.spm2.spm3}{\cos\theta.\cos\emptyset.\cos\alpha}$
Lu,1997	$Vip=\frac{1}{(Fimp)q}(Vip)_0$
Kuthe et .al ,2018	$V^{0.4}= 0.37+0.52A-7.89SF + 9.10A \times SF - 0.24A^2 + 174.67SF^2$ $V^{0.73}=-0.14 +0.96A+ 15.37SF+ 18.65A \times SF- 0.82A2-125.68SF^2$
Where; RQD-Rock Quality Designation, Jn-Joint No.,V_{b0}-Volume of rock,s1..s2 are spacing of each joint, $\gamma1$, $\gamma2$, $\gamma3$ angle between joint sets,p1.p2-persistant of joint sets, the ratio of the equivalent block volume with non-persistent joints (p1<1).,V_{ip} and C_{ip} =10,20…100) are respective block size of percentage passing and empirical coefficient I and percentage passing spm1,spm2 and ϕ, γ, θ are angle between mean orientation,V_{ip}0-predicted results of IBSD, F_{imp} –relative impersistent factor; V is the actual Volume of the blocks, A is the frontal Surface Area and SF is the Shape Factor of the blocks.	

discontinuity plane angle. The value of *A* estimated by this algorithm falls in the range from nearly 1 to 13. The new algorithm promoted the application of the Kuz-Ram model in practice.

The Kuz-Ram model is the most widely used published approach for predicting the BBSD. This approach has several particular advantages: familiar parameters, simple calculation and good adaptability to different blasting situation. But, it gives emphasis to the details of the explosives and the blast design geometry and arguably does not take good account of the geological conditions of the in situ rock mass. Commonly used BBS equations are given in Table 3.

Table 3: Fragmentation prediction models

Researchers	Empirical Relation
(Langefors & Kihlstrom, 1978)	$k_{50} = 0.16\,(Bd)^{0.68/Q}$
(Kuznetsov, 1973) Equation	$k_{50} = A\,(V/Q)^{0.8}\,.\,Q^{0.17}$
(CVB Cunningham, 1983) / Modified (Kuznetsov, 1973)	$k_{50} = A\,(V/Q)^{0.8} Q^{0.17}\ (E/115)\text{-}0.63$
CSIR-CIMFR Models (Chakraborty et al., 2004)	$k_{50} = 0.07\,(l_s)^{0.54}\ (A/q)^{0.172}$
Where; k_{50} = mean fragment size; A=Rock factor *V*= rock volume broken per blast(m^3), Bd= Blast Diameter (mm) *Q*= The mass of TNT containing the energy equivalent of explosive charge in each blast(kg) *E* = Relative strength of TNT compared to ANFO (ANFO-100) is 115	

As can be seen from the Table 3, a factor A has been used in most of the equations for predicting the k_{50}. However, the role of IBS has not been considered to such detail as required.

2.3 Direct Measurement from Blastpile Images

Several methods have been developed by various researchers that have been used to measure the blast fragmentation using image analysis methods as compiled in Table 4. The process of measurement involves taking calibrated images of the muck and then measuring these with the help of software(s) that can delineate the edges of fragments and finally provide a size distribution. Lot of representative images are taken from the muck and analyzed which are further merged to provide the BBSD of a blast as explained in Figure 2.

Fragalyst, (Raina et al., 2009)is one such software that has the multiple functions where the digital images of blasted fragments can be analyzed for size distribution (BBSD) and the in situ block size distribution (IBSD) can also be determined using joint frequencies in blast face. Joint determined by using scanline method which in turn determines the IBSD.

Table 4: Fragmentation measurement methods by various researchers

Researchers	Measurement Methods
Noren & Porter (1974)	The cross sectional view of the blastpile was successively evaluated and compared with the results from surface views.
Nyberg et al. (1983)	proposed a method for estimation of fragment size distribution with automatic image processing
Cunningham, (1983)	Using some standard fragmentation photographs of blastpiles with known distribution as references, the BBSD of a new blastpile could be estimated by means of the photographs taken of blastpiles
Grainger and Paine (1990)	described a photographic fragmentation assessment technique and the comparisons of the photographic technique with manual measurements
Ord & Cheung (1991)	developed an on line, noncontact fragment size monitoring and image analysis system
Wang et al. (1991)	Devised a simple technique to estimate the median sieve size or 50% passing block volume using a photographic method
Rustan & Nie (1992)	Used the digitizing technique and a so-called radial line sampling procedure for analyzing fragmentation
Maerz & Germain (1996)	Fragmented rock in the backs of dumper trucks were taken as the input of photo analysis.
Singh et al. (2019)	Focused on the development of a photographic technique for assessing fragmentation in an underground environment.

With the advent of modern day equipment and methods, the image analysis techniques have advanced a lot. Measurements are moving towards autonomous mode with the help of drones and continuous analysis of blast fragmentation measured on conveying systems. The artificial intelligence methods are also being deployed for further enhancing the capabilities of such software(s) to better delineate the fragments using artificial intelligence techniques.

3. Discussion

The literature review reveals that researchers use different procedures in estimating the in situ block size. Attempts should be made to provide uniformity in estimating the in situ block size to increase accuracy. It is evident from the published literature that blast fragmentation has been compared to the rock factor defined in terms of blastability of rockmass and blast design variables. However, as mentioned earlier, the in situ block size of the rockmass plays a greater role in defining the fragmentation during blasting and has not been dealt in with a greater detail.

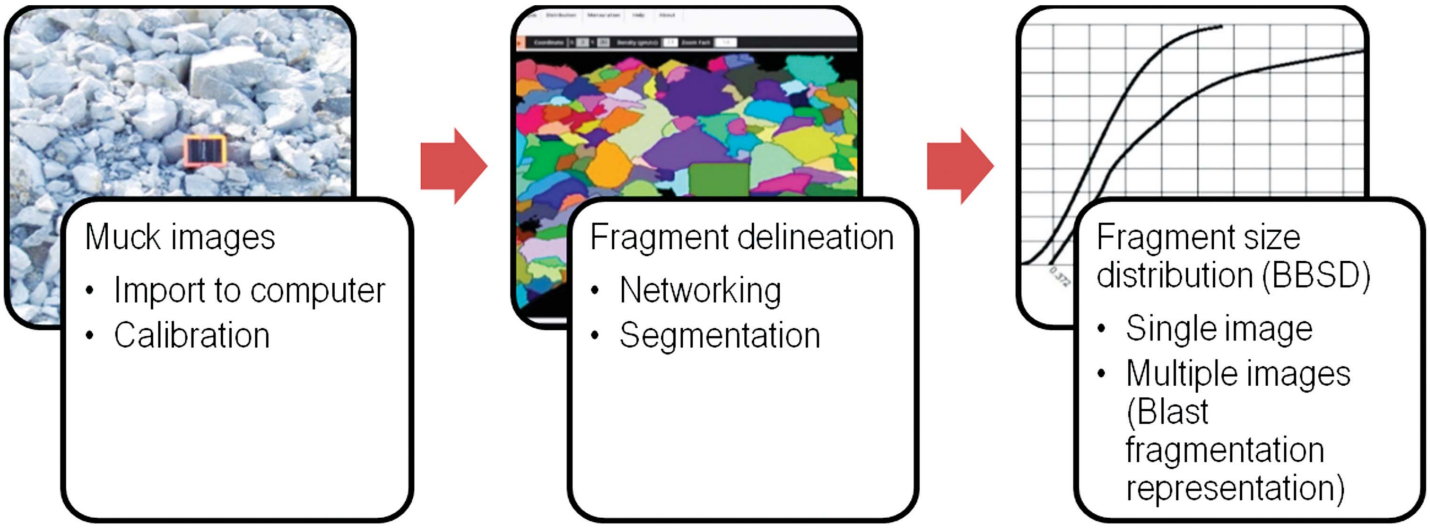

Figure 2: Process of fragmentation measurement using image analysis method

According to many researchers, it was a suggestion to determine role of in situ block size and other rock mass parameters that would be subjected to blasting .The problem in mine is that fragmentation is not optimized which increases cost of loading, hauling and overall Mine Mill Fragmentation System (MMFS). With a proper knowledge of in situ block size distribution, a blasting engineer can plan a best blast row to achieve optimum fragmentation size of rock.

Role of in situ block size on fragmentation to be investigated which is a major uncontrollable factor and which is not yet deeply explored. It is pertinent to know the impact of IBSD on BBSD, as it represents the block size transformation and hence energy consumption in blasting. This with deeper insight can augment the understanding of the fragmentation process and simultaneously help to define proper blast designs based on IBSD. These estimations are the most valuable when there is consistency and non-uniformity within a rockmass. However, current models that function in this capacity have difficulty in accurately accounting for grossly oversized fragments that result from non-uniform geological conditions.

The need for such study is thus amply clear from the inferences of Table 3, wherein it can be seen that IBS is not considered in prediction process.

4. Conclusions

- Literature review shows diverse procedures for estimating in situ block size
- Uniform estimation methods needed for improved accuracy
- Blast fragmentation often compared to rock factor and blast design variables
- In-situ block size crucial for defining fragmentation, but not extensively explored
- Emphasis on detailed analysis of in-situ block size in relation to fragmentation
- Need for greater understanding of in-situ block size's role in blasting operations

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ancestral and sacred to Native Americans. The proposed ban will affect four separate tracts, including the Buffalo Tract and the Crest of Montezuma, located northeast of Albuquerque.

The area contains "rich archaeological resources that span thousands of years of human history", according to a document from the Bureau of Land Management. It is also popular for hiking, camping and hunting.

A report issued by the Congressional Budget Office in August concluded the area impacted by the potential ban is rich in sand and gravel, but doesn't have enough sources of other minerals worth developing into mines. That report also forecast the land withdrawal would result in a decrease of $2 million in federal revenue.

There are, however, numerous mines and prospects in Sandoval county, with the area recording exploitable or exploited minerals such as graphite, gold, silver, uranium, lead, and copper.

Last week, the DOI announced it planned to change a 151-year-old law governing mining for copper, gold and other minerals on public lands. The modifications would include making companies for the first time pay royalties on what they extract.

The DOI-led committee also recommended the creation of a mine leasing system and coordination of permitting efforts among a range of federal agencies.

Cecilia Jamasmie | September 19, 2023

Brazil calls on rich nations to pay for global energy transition

Brazil is calling on wealthy nations to pay for the world's transition to sustainable energy as these countries need bolder commitments to make up for their reliance on polluting power sources.

Developing countries "cannot finance an energy transition in the mold of Europe and the US," and need assistance from the developed world, Brazil's Mines and Energy Minister Alexandre Silveira said in an interview in New York. Industrialized nations should take on bigger challenges as "they get their energy from much less clean sources than those in the Global South."

The request for rich countries to invest more to help the world to transit away from fossil fuels is likely to be mentioned again by President Luiz Inacio Lula da Silva, when he'll address other world leaders at UN's

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IMPROVEMENT – THE SOUL OF QUALITY MANAGEMENT SYSTEM

Prof Oruganti Subba Rao

Abstract

This paper highlights that improvement is a key factor of an effective Quality Management System (QMS) implementation. Compliance with QMS requirements does not transform an organization into an effective organization. The organizations, aspiring to be effective and best in class, need to pay attention to improvements.

***Keywords**: Housekeeping, Analysis of failure, Effectiveness, Achievement of objectives*

1.0 Introduction

Under India's Make-in-India initiative, many entrepreneurs entered into the Aero-space-defense sector. Applications in the Aero-space-defense sector are highly sensitive to even tiniest faults in parts or subsystems. That is why product conformity is emphasized in QMS. Product conformity defines the reliability of parts and subsystems during the application of the final product in a mission. This ultimate truth compels customers to audit the organizations before allowing them to be partners in the supply chain.

Organizations, which are not certified for QMS by any external certifying body, maintain documented information to meet the legal requirements, customer requirements and statutory financial audit's requirements to prepare financial statements. Such organizations are always reactive in nature. The purpose of study of such organizations is to provide feedback to transform the organization from reactive to proactive. The very purpose of implementing QMS in any organization is to make it proactive. A proactive organization only can withstand fierce competition and make its stakeholders delighted.

New entrants in this sector, which are struggling to establish themselves in the market, are exposed to vulnerabilities of poor management systems. Such entities, devoid of any direction, vision and objectives, spend entire time to surviving on getting the orders and fulfilling the same. The organization is run by the so called domain experts rather than by an established system. The attrition rate affects the productivity of such organization. Such organizations have appropriate potential, if QMS is implemented effectively.

The essence of any QMS lies in evidence. Whatever claims are made, organizations need to prove with evidence. Organizations provide documents and records as proof of implementation of QMS. Unfortunately these organizations are unable to provide any credible evidence of improvements in their operations. If any corrective action is taken, there is no evidence of verification of its effectiveness.

Failures are pillars of success. Profound Analysis of failures paves way for creative & innovative ideas and new opportunities, which lead to significant improvements in an organization.

The soul of QMS lies in improvements. An organization generates a lot of data during its operations. If the data is not analyzed and used for improvements, the precious data is just squandered. Top management is always focused on profit, cost and on time delivery. But if the data in each functional area is analyzed and actions are taken accordingly, effectiveness of functions will improve which will have an impact on profit, cost and on time delivery directly or indirectly.

Apart from analysis, the other aspect of QMS is the appearance of the premises of the organization, which leaves the first impact on a visitor to the organization.

There are many areas in an organization, which need to augment the appearance. The appearance in conjunction with effective QMS leaves an everlasting impression on customers, who want a long term relation with such organizations.

2.0 Method

Assessment of present practices of an organization, external auditor's reports and customer's audit report are the sources for this article. The gaps between present practice and requirements of an effective QMS were identified from these reports. Suggestions by customers and external auditors were also noted down. The information gathered was categorized into two: one pertaining to organization level and the other pertaining to functional level. Functional level information was sorted functional area wise.

This article addresses the key concerns and issues at organizational level and functional level emerged from the restructured findings and observations.

3.0 Discussion

The following areas are frequently identified by external certifying bodies and customers of the organizations for improvement.

Management Consultant, Hyderabad

3.1 Housekeeping [5.1, 5.2]

It is not unusual that posters of 5S of housekeeping hang all over the shop floor but the cleanliness of the area is not maintained. Cleanliness is only one part of 5S. The other parts are explained in storage. Cleanliness is not restricted to work places only; it should be conspicuously visible in the entire premises within the boundary wall of the organization. Cleanliness along with aesthetic appearance of the premises represents the culture, attitude and commitment of the people working there including the top management. The persons, who are conscious of the benefits of housekeeping, have a tendency to demonstrate the same in their own work also. The 5S of housekeeping should be a policy of organization and a discipline to be inculcated in all the employees to keep the area under their control to keep it clean.

3.2 Storage Materials [5.2]

"A place for each material and the material in its place" should be the policy of organization. Area for incoming material is identified but area for work-in-progress and area for finished goods are not clearly identified. This area is always decided on a day-to-day basis depending on availability of floor space. Due to lack of identification and traceability, a non-conforming product may be pushed to the next stage of production. Product conformity is the essence of Aero-space-defense QMS. Hence identification and status of material, throughout its life, from receipt to conversion and dispatch need to be maintained properly.

Control of counterfeit parts is one of the prime concerns of Aero-space-defense QMS. Organizations must identify a secured place to quarantine the counterfeit parts. The rejected items from suppliers need to be returned to them in the same condition as they were supplied by suppliers. But counterfeit parts need to be made dysfunctional before returning to the suppliers. They are made dysfunctional to ensure these counterfeit materials do not reappear in the supply chain. It is one of the terms and conditions of the contract. The employees need to be trained in identifying the counterfeit parts, quarantine procedure and disposal of the same.

Scrap [5.1]: This is one area where the entire organization is oblivion of. It is also part of the premises of the organization. It appears as a blotch on the otherwise beautiful premises.

An area for scrap is identified and scrap is dumped there. Scrap is never identified by its category. The scrap area is not organized for different categories of scrap. When scrap is accumulated and identified by nature of scrap and quantity, it yields a better price in the market than the mixed scrap. It also enhances the appearance of a scrap yard.

If the scrap has potential environmental issues, then the organization must have a defined procedure for its handling, storage and disposal.

3.3 Layout [5.2]

The layout does not merely mean the location of buildings and arrangement of machines on the shop floor. A good layout also includes pathways, signage and emergency exits in case of fire or such hazardous situations.

The layout does not clearly identify the pathways for material movement with yellow lines on both sides of the path. A clean pathway needs be maintained for smooth transfer of materials from one place to another place to avoid accidents.

Lack of signage is also highlighted by some customers in their visit report. Signage not only improves the elegance of premises, but they are also a source of information to a stranger about the location of various facilities within the premises.

Most of the organizations are not aware of this concept. Display of emergency exit path must be visible to a person, wherever he may be within premises, in case of hazardous situations.

3.4 Material Handling Equipment [5.2]

In some of the organizations it has been observed that periodic inspection of overhead cranes and forklifts are not carried out to ascertain its fitness. This may lead to accidents. Accidents add to undesirable costs. It also disrupts the rhythm of the production cycle and impacts the delivery schedule. Hence an organization needs to have defined procedures for equipment fitness tests.

Some organizations use battery operated carts for material transfer within premises. It has been observed that the driver of the cart does not have any driving license issued by Regional Transport Authority (RTA). It has been suggested to define a procedure for selection of driver mentioning the criteria to be fulfilled and if required, training required. This is to meet the competence requirement for the job to be done.

3.5 Analysis of data

Organizations collect data on organizational objectives and process measures. But the data is neither analyzed for trends nor for failure to achieve the targets. Simple statistical tools are available in Microsoft excel sheets, which can be used for analysis. Based on the findings, operations of the company could be fine-tuned. This is the best method of improvement.

Decisions taken based on findings of analysis of data have the highest probability of success in achieving planned objectives rather than the decisions based on gut feeling.

Suggestions in the following areas are made by Certifying Bodies and consultants for improvement in each functional area based on Analysis of data..

3.5.1 Marketing [5.2]**:** Risk assessment of tenders is done prior to submitting the offer. Based on perceived risk, some tenders are regretted. Tenders regretted, Tenders not converted into orders are never analyzed for lost opportunity.

Analysis of Tenders regretted provides a clue to future expansions. Cost-benefit analysis of the probable values of tenders and the funds required for investment to win the tenders will help the organization to make better decisions regarding future expansion programs.

Tenders not converted into orders clearly indicate the flaw in the estimation process. It is observed in many organizations, estimates are akin to guesstimates. Estimation is a scientific process. It is based on material required, man-hours required, machine-hours required and a portion of fixed costs and the margin expected. All these have past data to rely on for estimation. The past data need to be corrected for inflation, wherever applicable, to arrive at a reasonable quote at 95% confidence level. Lessons learnt from tenders lost helps to fine tune the estimation process.

3.5.2 Planning [5.1,5.2]**:** Each order is like a project. Project Management tools are very rarely used. Even if used, it is in the planning stage only. This tool is never taken to its logical end. Once the order is completed, it is never analyzed for non-compliance to plan and lessons learnt from its failure or successes.

The job shop type of organization arranges machines in product layout. No two orders may necessarily have the same sequence of processes. Hence a job card or route card is necessary to facilitate transfer of material from one machine to another machine as per the sequence of operations mentioned in the job or route card. In most of the cases, it is left to production personnel.

Planning department is expected to generate job or route card based project planning. When a key item with key characteristics is produced, that must be highlighted. This is the requirement of the aero-space-defense standard.

An organization works on many orders simultaneously. While preparing project planning for all orders, one can observe load on each machine. This requires resource leveling technique of project management. This will help in preparing a right schedule to meet the delivery deadlines of all orders. If a plan is near perfect, execution becomes simple without resorting to any firefighting in meeting the deadlines. This area needs a lot of improvement.

3.5.3 Production

3.5.3.1 Product damage [5.2]: It has been observed in some organizations that even the heavy materials are handled by human labor. This can be a potential cause for accidents which may lead to damage of the product. The damage may be variations in dimensions, chipping, denting etc. etc. Many times these can be detected by inspecting the items. Even if visible damages are absent, the impact due to fall may affect the inner homogenous structure of the component or subsystem. This may affect the reliability of the product, when the final product is used in the final mission.

Suitable material handling equipment should be used, wherever applicable. Such incidents are never recorded and analyzed for corrective action.

This is also mandatory to maintain the product conformity throughout its life of production till dispatch. It is a requirement of Aero-space-defense QMS. Product conformity is highlighted to ensure its reliability of each part of the final product put to use during the missions undertaken by the aero-space-defense sector.

3.5.3.2 Equipment Damage [5.2]: Equipment damage leads to disruption in production and business continuity. Equipment can get damaged when loading a job on a machine, unloading a job from a machine or not following the correct procedure to operate the machine.

Work instructions to operate the equipment are usually not available with operational personnel. If training is provided to operate a machine, evidence of evaluation of effectiveness of training is not evidenced.

In India there is a famous word “Jugaad”. Jugaad is good in case of emergency, when one has to finish a task with available limited resources. Jugaad as an established process is detrimental. Author observed in a forging company, operational personnel using a jugaad to load heavy items in the furnace and unloading the items from the furnace. At the inception of the company, jugaad might have been manageable and practical because of limited resources. But after ten years of successful existence in the market, jugaad is not replaced by appropriate material handling equipment. This is against the principles of effective QMS. Provision of appropriate and necessary resources for operation is one of the requirements of QMS.

3.5.3.3 Rework [5.1,5.2]: Rework is almost a norm. But reworks are never analyzed for failure and reduction of reworks. If reworks are reduced, it will add to cost reduction. Improvement in reduction of rework is an indication of effective QMS.

3.5.4 QC/QA [5.2]

3.5.4.1 Rejection by customer: Customer rejection is attended and rectified.

3.5.4.2 Complaint by customer: Customer complaint is addressed and resolved.

In both cases, organizations never investigate to find the root cause and a sustainable corrective action. Rejection

by customer itself highlights the incompetency of Quality Assurance personnel, who have passed the final product for onward dispatch to customer. The root cause can be: competence of inspection personnel, calibration status and fitness of measuring equipment or the procedure for inspection. If the corrective action has no impact on any of them, the corrective action itself should be subjected to investigation. The purpose of corrective action is to ensure such incidents never happen in future.

3.5.5 Purchase [5.2]: Vendor rating system is literally absent. Vendor Rating System has an impact on supplier selection process. The purpose of supplier selection is to create a trustworthy supplier base. Vendor Performance Evaluation at the end of one year indicates whether the vendor is trustworthy or not.

Supplier selection is based on some parameters as decided by the organization. Control of counterfeit parts is one key concern of Aero-space-defense QMS. QMS standard specifies that a supplier should be an OEM, OEM certified vendor or customer designated supplier. In case a supplier does not fall in of three mentioned above, the organization must have an elaborate process to qualify the supplier to be in the approved vendor list. One of the requirements of QMS is that all supply chain partners must adhere to the requirements of QMS. This is expected that each organization in the supply chain emphasizes and ensures its supplier base adheres to QMS requirements.

Even if some organizations show data on vendor rating, no credible action on suppliers with poor performance is evident. No credible evidence is provided for finding an alternate supplier. If the data of vendor rating is carefully analyzed, it will throw light on flaws of the supplier selection process. But in practice the findings of Vendor Rating never reflect on the supplier selection process.

3.5.6 Maintenance [5.1,5.2]
Breakdown of equipment: Breakdown of equipment is because of poor preventive maintenance procedure or neglect during preventive maintenance activities or poor judgment during preventive maintenance activities. Occurrence of breakdown maintenance is the evidence of ineffective preventive maintenance.

The Bureau of Indian Standards (BIS) released an exhaustive standard on Condition based Maintenance (CBM) of different types of equipment. Preventive maintenance is a lethargic process whereas CBM is a proactive process. CBM is amenable to be a technology driven process. Control parameters of equipment are monitored by a computer. Whenever controls are breached, it raises an alarm either in the form of sound or light. Organizations should deliberate on implementing the CBM rather than the conventional preventive maintenance.

Breakdown incidents are registered but investigation of breakdown is completely absent. Investigation of breakdown and subsequent application of sustainable corrective action needs to be adopted by organizations to reduce the incidents of breakdowns.

3.5.7 HR [5.2]: This is the most neglected part of QMS implantation of an organization. The purpose of training is to enhance the competency of employees so that they can effectively perform in their area of work to achieve targets. Training records are maintained to meet the compliance QMS requirements. Training needs identification document itself raises many questions on identification of topics. These topics are never analyzed – how these topics will create a knowledgeable and effective workforce.

Evaluation of effectiveness of training imparted is almost absent in organizations. The training is imparted to employees so that they can implement the same in their work place. Employees are never assessed for implementation of knowledge gained through training at any point of time after imparting the same. This area needs to be addressed by organizations.

3.5.8 Top Management
3.5.8.1 Security breach [5.3]: Entry of a person without permission into a secure area is defined as a security breach. Most of the cases the person is removed from the area. But there is no procedure to find the root cause and a scheme for corrective action.

3.5.8.2 Accidents [5.1,5.2]: whenever serious accidents happen in an organization, they follow the legal requirements only. But implementation of effective corrective action is not evidenced.

Organizations ought to have defined procedures to investigate Security breach, accidents, Product damage, Equipment damage, Breakdown of equipment, Rejection by customer and Complaint by customer.

4.0 Conclusion

Improvement is the soul of any Quality management System. Improvement alone is the evidence that an organization is aware and conscious of its environment in which it functions. Improvements only can keep an organization agile and provide a competitive edge. Without visible and credible improvements, an organization may have a blinkered efficient workforce but it will not have an effective workforce to achieve desired targets with zeal.

5. References

5.1 ISO: 9001:2015 Quality Management Systems - Requirements

5.2 AS9100D Aero-Space-Defense- Quality Management System - Requirements

5.3 ISO 27001:2022 Information Security Management System - Requirements

50th AGM AWARDS CEREMONY GLIMPSES (HELD ON 25-08-2023)

Lifetime Achievement Awardees for the year 2022

Award presented to Shri. Arun Kothari - Former Director, Department of Mines & Geology, Govt. of Rajasthan and Past President, MEAI

Award presented to Shri. S.N. Mathur Former General Manager, GMDC LTD and Vice President-I, MEAI

Award presented to Shri. D.A. Hiremath Former Joint Director, DMG, Maharashtra, Nagpur and Council Member, MEAI

MEAI Awards Instituted by Organisations/Individuals for the year 2022

MEAI – Sitaram Rungta Memorial Award was presented to Shri. Niladri Bhattacharjee, Assistant Divisional Manager, Tata Steel Mining Ltd.

MEAI - NMDC Award was presented to Shri. Mallikarjun Sarapur, GM (Production), Karnataka State Minerals Co. Ltd.

MEAI - Abheraj Baldota Memorial Gold Medal Award (Mining Engineer of the Year) was presented to Shri. K. Prabhakara Reddy, CEO, Sai Universal Mining Services and Sums Techno Labs Pvt. Lab.

MEAI - Abheraj Baldota Memorial Gold Medal Award (Young Mining Engineer of the Year) was presented to Shri. Vivek Kumar Himanshu, Senior Scientist, CSIR- Central Institute of Mining and Fuel Research, Dhanbad

MEAI - SRG Information Technology Award was presented to Shri. Cyriac Joseph, MD & CEO, Squadrone Infra & Mining Pvt. Ltd.

MEAI - Smt. Gullapalli Sarala Devi Memorial Award was presented to Shri. Debi Prasad Tripathy, Professor, Department of Mining, NIT, Rourkela.

MEAI - SCCL Coal Award - Mining Engineer for the year 2022 was presented to Dr. Karra Ram Chandar Associate Professor & Former- Head of the Department of Mining, NITK.

MEAI - Smt. Bala Tandon Award was presented to Shri. Dhananjay Kumar, Senior GM (Mines)/ Mines Head, Mining Division, GHCL Ltd.

MEAI - Smt. Veena Roonwal Memorial Award was presented to Shri. Suryanshu Choudhury Head - Mine Planning, GMDC Ltd.

MEAI - Smt. Kiran Devi Singhal Memorial Award was presented to Dr. Yamuna Singh, Former Head, AMD, Department of Atomic Energy, GoI

MEAI Service Excellence Awards for the Year 2022

Shri. D.B. Sundara Ramam, Vice President – III receiving the Service Excellence Award

Shri. B.S.P Raju - Jt. Treasurer cum Secretary, receiving the Service Excellence Award

Shri. A.R. Vijay Singh - Council Member, MEAI receiving the Service Excellence Award

Shri. Deepak Vidyarthi - Council Member, MEAI receiving the Service Excellence Award

Prof. Bhabesh C. Sarkar - Chairman, Dhanbad Chapter receiving the Service Excellence Award

Shri. Deepak Gupta - Chairman, New Delhi Chapter receiving the Service Excellence Award

Dr. T.N. Venugopal - Council Member, MEAI receiving the Service Excellence Award

Shri. Pratyendra Upadhyay - Secretary, Jabalpur Chapter receiving the Service Excellence Award

Shri. H.K. Joshi - Chairman, Ahmedabad Chapter receiving the Service Excellence Award

Ms. Gunjan Pandey - Secretary, Ahmedabad Chapter receiving the Service Excellence Award

Shri. Madhusudhan Paliwal - Chairman, Udaipur Chapter receiving the Service Excellence Award

Shri. A.L.V.S. Varma - Secretary, Singareni Chapter receiving the Service Excellence Award

Shri. Asif Ansari - Secretary, Udaipur Chapter receiving the Service Excellence Award

Shri. B.K. Purandara - Chairman, Belgaum Chapter receiving the Service Excellence Award

Shri. K. Sudhakar - Secretary, Rayalaseema Chapter receiving the Service Excellence Award

Shri. Amit Ghooli - Secretary, Belgaum Chapter receiving the Service Excellence Award

Shri. A.K. Jaiswal - Chairman, Jodhpur Chapter receiving the Service Excellence Award

Dr. Abani Samal, Council Member receiving the Service Excellence Award

Shri. Indrasingh Surana - Member, MEAI receiving the Service Excellence Award

Shri. Chandrashekar Halli - Member, MEAI receiving the Service Excellence Award

Shri. Kumar Mohan Singh - Member, MEAI receiving the Service Excellence Award

Shri. T.R. Rajasekhar – Founder Member, NACRI receiving the Service Excellence Award

MEAI Active Chapter Awards for the Year 2022

MEAI - Active Chapter Awardee: Ahmedabad Chapter

Shri. Ifthikar Ahmed - Member, MEAI receiving the Service Excellence Award

MEAI - Active Chapter Awardee: Rajasthan Chapter-Udaipur

MEAI - Active Chapter Awardee: Bangalore Chapter

MEAI - Active Chapter Awardee: Belgaum Chapter

MEAI - Active Chapter Awardee: Bhubaneswar Chapter

MEAI Special Awards for the year 2022

Special Award for Celebration of Indian Mining Day: Ahmedabad Chapter

Special Award for plantation: Belgaum Chapter

Special Award for plantation: Bellary - Hospet Chapter

Special Award for Membership Development presented to Shri. Kumar Mohan Singh Member, MEAI

Special Award for Membership Development presented to Shri. S.N. Patil - Member, MEAI

Special Award for Membership Development presented to Shri. V.S. Prajapathi - Member, MEAI

Special Award for Membership Development presented to Ms. Gunjan Pandey - Secretary, Ahmedabad Chapter

Special Award for Enrolling Maximum Student Members presented to Dr. Lingampally Sai Vinay - JNTUH University College of Engineering Manthani Peddapalli

Special Award for Hosting Council Meeting presented to Barajamda Chapter

Special Award for Hosting Council Meeting presented to Udaipur Chapter

Special Award for Hosting Council Meeting presented to Singareni Chapter

Special Award for Hosting Council Meeting presented to Bangalore Chapter

Special Award for Enrolling Maximum Life Members presented to Shri. H.K. Joshi - Chairman, Ahmedabad Chapter

Special Award for starting New Chapter presented to Shri. K. Madhusudhana, President

Installation of the MEAI President Shri. S.N. Mathur, Office bearers and the Council for the term 2023-25

Shri. K. Madhusudhana, outgoing President, handing over the President medallion to Shri. S.N. Mathur, the incoming President of MEAI

Shri. S.N. Mathur, President installing Shri. D.B. Sundara Ramam as Vice President – II

Shri. S.N. Mathur installing Shri. G. Dhananjaya Reddy as Vice President – III

Shri. S.N. Mathur installing Shri. B. Sahoo as Jt. Secretary cum Treasurer

Group photo of New Council for the term 2023-2025

COUNCIL FOR THE TERM 2023 – 2025

I. Office Bearers

President	Shri S.N. Mathur
Vice President 1	Shri D.B. Sundara Ramam
Vice President 2	Shri. G. Dhananjaya Reddy
Vice President 3	
Secretary General	Shri M. Narsaiah
Joint Secretary cum Treasurer	Shri. B. Sahoo

Ii. Elected Council Members - 30

Shri. Amish Kumar Makadiya
Shri. A.K. Garg
Dr. T. N. Venugopal
Shri. Cyriac Joseph
Shri. Rachappa M. Saradagi
Shri. A. Avudaiyappan
Shri. Kumar Mohan Singh
Shri. Ravi Chandran Raj
Shri. Mohan Nilaram Rahangdale
Shri. Santosh Kumar Adhikari
Shri. Ankan Mitra
Shri. B.L. Kotriwala
Shri. P.C. Bakliwal
Shri. S.S. Rathore
Shri. S.K. Vashisth
Shri. P.V. Krishnaiah Yadav
Shri. G.R. Magesh
Shri. M. Palanikumaresan
Shri. Sabyasachi Mohanty
Shri. R.S. Raghuwanshi
Shri. Sunil Kumar Singh
Shri. K. Prabhakara Reddy
Dr. Kripamoy Sarkar
Shri. B. Surender Mohan
Shri. Mittapally Satish Kumar
Shri. K. Venkataramana
Shri. P.C. Purohit
Shri. Prem Raj Dave
Shri. Bipin Kumar Giri
Shri. Ajay Kumar Goyal

III. Council Members – Nominated

Prof. Sushil Bhandari
Shri. Deepak Vidyarthi
Shri. V. Laxminarayana
Shri. Gajula Lakshminarayana
Shri. K. Laxminarayana

IV. Council Members – Co-opted

Prof. B.B. Dhar
Shri. B.R.V. Susheel Kumar
Shri. L.S. Shekhawat
Shri. Ajay Kumar Jain
Shri. A.B. Panigrahi

V. Representatives of Life Institutional Members

Shri. Mirza Mohammad Abdulla
Shri. Vinay Kumar
Shri. Venkateswara Reddy
Dr. H.Y. Desai
Shri. L. Kulshreshtha

VI. Special Invitees

Shri. A.R. Vijay Singh
Dr. N.K. Nanda
Dr. Abani Ranjan Samal

VIII. Ex-Officio

Shri. Sanjay Kumar Patnaik
Shri. K. Madhusudhana

IX. Past Presidents

Shri V.S. Rao
Shri Md. Fasihuddin
Shri K.K. Biran
Shri. R.N. Singh
Shri R.P. Gupta
Shri. Meda Venkataiah
Dr. V.D. Rajagopal
Shri. Arun Kumar Kothari
Shri. T. Victor
Shri. Arun Kumar Kothari

X. Past Hony. Secretary / Secretary Generals

Dr. P.V. Rao
Shri. A.S. Rao
Shri Koneru V.Rao
Dr. H. Sarvothaman
Shri S. Krishnamurthy

XI. Editor MEJ

Dr. P V. Rao

VII. Chapter Chairman & Secretary

Sl.No.	Chapter	Chairman	Secretary
1.	Ahmedabad	Swagat Ray	Ms Gunjan Pande
2.	Bailadila	B. Venkateswarlu	T. Shiva Kumar
3.	Bangalore	Dr. H.S. Venkatesh	Sitaram Kemmannu
4.	Barajamda	Atul Kumar Bhatnagar	Shirish Shekar
5.	Belgaum	Dr. B.K. Purandara	Amit Ghooly
6.	Bellary-Hospet	S.H.M. Mallikajuna	P. Venkateswara Rao
7.	Bhubaneswar	P.K. Satija	Shambhu Nath Jha
8.	Dhanbad	Prof. Bhabesh C. Sarkar	Prof. B.S. Choudhary
9.	Goa	Joseph Coelho	Ramesh Kumar Singh
10.	Himalayan	Rajendra Tewari	Dr. S.S. Randhawa
11.	Hutti-Kalaburagi	Prakash	Arunachalam
12.	Hyderabad	Sumit Deb	B. Mahesh
13.	Jabalpur	Pukhraj Nenival	Pratyendra Upadhyay
14.	Kolkata	-	-
15.	Mumbai	-	-
16.	Nagpur	P.N. Sharma	Dr. Y.G. Kale
17.	New Delhi	Deepak Gupta	Deep Krishna
18.	Ongole-Vijayawada	K. Subhaskar Reddy	Sarat Chandra Babu
19.	Rajasthan-Jaipur	Anil Mathur	Kedar Singh Yadav
20.	Rajasthan-Jodhpur	A.K. Jaiswal	Dr. Ram Prasad Choudhary
21.	Rajasthan-Udaipur	M.S. Paliwal	Asif Mohmmed Ansari
22.	Raipur	B.L. Bhati	Dinesh Singh
23.	Rayalaseema	K. Naga Sidda Reddy	Kalidindi Sudhakar
24.	Singareni	S. Chandrasekhar	A.L.S.V. Sunil Varma
25.	Tamil Nadu	Dr. T. Subramani	R. Kamaraj
26.	Veraval-Porbandar	Manish Kumar Yadav	C.M. Dwivedi
27.	Visakhapatnam	Dr. C.H. Rao	Harikrishna Karumudi

MEAI NEWS

MINING ENGINEERS' ASSOCIATION OF INDIA

8th Council Meeting held at Ahmedabad

The 8th Council Meeting was held on 25-08-2023 at 10.00 AM at the Wyndham (Club O7), Shela, Ahmedabad, hosted by Ahmedabad Chapter.

Officer Bearers Shri. K. Madhusudhana – President, Shri. S.N. Mathur - Vice President – I, Shri. D B. Sundara Ramam - Vice President – III, Shri. M. Narsaiah – Secretary General and Shri. B S P. Raju – Jt. Secretary cum Treasurer attended the meeting.

The other council members / invitees that attended the council meeting are Shri. Arun Kumar Kothari, Shri. Sanjay Kumar Patnaik, Shri. R P. Gupta, Dr. V D. Rajagopal, Shri. T. Victor, Shri. G. Dhananjay Reddy, Shri. B. Sahoo, Dr. P V. Rao, Shri. T.N. Venugopal, Shri. D.A. Hiremath, Shri. Deepak Vidyarthi, Shri. Anil Kumar Garg, Shri S.K. Vashisth, Shri Manish Kumar Yadav, Shri S.K. Parihar, Shri G.R. Magesh, Shri P.C. Bakliwal, Shri. V. Lakshimnarayana, Dr. P.T. Hanamgond, Shri P.N. Rao, Shri. K. Ramachandar, Prof. B B. Dhar, Shri. Rajendra Singh Rathore, Dr. A.R. Samal, Shri Vijay Singh A R, Shri. M S. Rachappa, Shri H K Joshi, Ms. Gunjan Pande, Shri. K. Prabhakara Reddy, Dr. B.K. Purandara, Shri. Amit Ghooli, Prof. Bhabesh C. Sarkar, Shri. Anil Mathur, Shri. Kedar Singh, Shri. Pukhraj Nenival Shri. Pratyendra Upadhyay, Shri. A.K. Jaiswal, Shri Ram Prasad Chowdary, Shri. Deepak Gupta, Shri. K. Sudhakar, Shri. A L S V. Sunil Verma, Shri. Madhu Sudan Paliwal, Shri. Asif Ansari, Shri. Manish Kumar Yadav, Dr. M. Ifthikhar Ahmed, Shri. Kumar Mohan Singh, Shri. B.L. Kotriwala, Dr. D.A. Pancholi, Shri. Mallikarjun Sarapur, Shri. P R.Dave, Shri. Indra Singh Surana, Prof. G.K. Pradhan, Shri. T R. Rajasekhar and Shri. K. Venkataramana.

(L-R) Shri. B S P. Raju, Shri. M. Narsaiah, Shri. K. Madhusudhana, Shri. S N. Mathur and Shri. D.B. Sundara Ramam conducting the 8th Council Meeting at Ahmedabad

Homage to the departed Members of MEAI

Council members attending the 8th Council Meeting at Wyndham (Club O7), Shela, Ahmedabad

MEAI 50TH AGM HIGHLIGHTS

(Held on 25-08-2023 at Ahmedabad)

President Shri. K. Madhusudhana with Shri. S.N. Mathur, VP – I, Shri. D.B. Sundara Ramam, VP – III, Shri. M. Narsaiah, SG and Shri. B.S.P. Raju, Jt. Secretary cum Treasurer releasing the Annual Report at 50th AGM in Ahmedabad

Shri. K. Madhusudhana addressing the 50th AGM

Shri. V. Lakshminarayana, Returning Officer announcing the incoming Vice President – III, Jt. Secretary cum Treasurer and Elected Council members for the term 2023-2025

View of Members attending the 50th Annual General Meeting

BHUBANESWAR CHAPTER

Tata Steel Mining Hosts Knowledge Sharing Session at Bhubaneswar on August 31, 2023

Tata Steel Mining Limited (TSML) organised a technical session on "Quality of Resource Estimation: impact on the assessment of productivity through mine-mill reconciliation" for the Bhubaneswar Chapter of the Mining Engineers Association of India (MEAI), a premier organization dedicated to advancing the field of mining engineering, here on Thursday. The event brought together industry experts, professionals, and enthusiasts to foster the exchange of valuable insights and expertise in the mining sector.

The session witnessed an impressive turnout of participants who eagerly engaged in discussions and learning opportunities. The event was aimed at providing a platform for knowledge dissemination, networking, and collaboration, promoting the growth of mining engineering in the region.

The session featured distinguished speaker Dr. Abani R. Samal, Principal, GeoGlobal, LLC, Utah, USA who shared his experiences, research findings, and innovative ideas on a range of pertinent topics such as mining value chain, mineral resources and reserves, mineral resource estimation, variability in grade tonnage estimates due to interpolation parameters and importance of accuracy of resource and reserve models.

Pankaj Satija, Managing Director, TSML and Chairman, Bhubaneswar Chapter said, "This event reflects our commitment to enhancing the knowledge and expertise of mining professionals and promoting the responsible development of the mining industry. By bringing together experts, professionals, and enthusiasts, we aim to ignite new ideas and drive the progress of our industry, while upholding the highest standards of ethics and sustainability."

Eminent mining engineers and geoscientists from companies like Tata Steel Mining Limited, Jindal Stainless Limited, Jindal Steel and Power Limited, IMFA, JSW, FACOR and Odisha Mining Corporation graced the event. The participants discussed pertinent topics like sustainable mining practices, technological advancements in mineral extraction, environmental conservation, safety protocols, and community engagement at the do.

The Bhubaneswar Chapter remains dedicated to organizing such knowledge-sharing initiatives on a regular basis. The Chapter is committed to organise sessions on best practices across the world in the field of geosciences as well provide platform for people involved in mining industry to implement such ideas for making India among the best mining destinations of the world.

Dr Abani Samal speaking on the occasion

Mr Pankaj Saija honoring Dr Abani Samal with a memento

(Continued from Page 21)

General Assembly meeting next week. Since returning to power in January, the 77-year-old leftist has been calling for more international support to help save the Amazon forest and create climate financing solutions.

Brazil's government has been a vocal advocate of having developed nations follow through on their climate financing pledges, which fall short of the trillions of dollars needed to actually prevent global temperatures from rising more than 1.5 degrees Celsius (2.7 degrees Fahrenheit).

Developing nations in the Southern Hemisphere will feed the developed world with clean energy, which will leverage these countries' position in global trade, according to Silveira. The minister expects Brazil to draw in $400 billion in investment over the next decade for the production of biofuels, including sustainable aviation fuel and green diesel. Silveira sees the production of biofuels in Brazil as its "liberation from the OPEC cartel".

Brazil can "demand respect from industrialized countries" who will increasingly depend on Latin America's largest economy for biofuels and green hydrogen, he said. "It's clear to everyone that green hydrogen, as a decarbonized source of energy in developed nations, will come from countries in the Global South. Brazil comes out ahead on this agenda."

Silveira wants Brazil's commodity giants Petroleo Brasileiro SA and Vale SA to spearhead the energy transition domestically, including with the production and use of green hydrogen.

While the Brazilian government has pushed for the climate agenda globally, it also seeks to increase oil production at home. State-controlled oil company Petrobras will keep increasing fossil fuel output for decades to come. The country's output is set to reach a record this year and will keep growing until 2030.

Petrobras is also looking to open up new basins in other parts of Brazil, including the so-called Equatorial Margin, an ecologically sensitive offshore region in the far north of the country. The push to survey the area has led to protests from environmental activists and tensions among Lula's allies.

Silveira pushed back on criticism that the approach was contradiction, arguing that Brazil needs to find ways to finance the energy transition. The government recognizes the transition "needs exposure, potential for development and financing."

Bloomberg News / September 17, 2023

MEAI TECH SERIES – SEPT 2023 (MTS–14)

Environmental Clearance of Mining Projects by Dr. Gurdeep Singh, Advisor Environment (GMDC)

In continuation of the Technical Series, MEAI conducted the FOURTEENTH ESENTATION of "MTS" on 22nd September 2023 at 06:30 pm on WebEx platform.

Dr. Gurdeep Singh, Advisor (Environment) GMDC was the speaker. Large number of professionals had joined and appreciated the disquisition. MEAI is highly thankful to Dr Gurdeep Singh for delivering the talk on the burning question of the day, in the Tech Series.

TOPIC: Environmental Clearance of Mining Projects.

COVERAGE:

• Environmental impact assessment	• baseline situation;	• categorisation of projects
• types of projects	• TOR prescription	• public consultations
• appraisal of projects	• timeline provided in the EIA notification	• mining issues Odisha and Jharkhand
• EIA of mining projects	• EAC SEAC appraisal issues	• violation notification
• compliance of Hon'ble SC directions	• e-auction	• standard TOR
• delegation of more power to SEIAA and DEIAA	• post clearance monitoring	

With a very interactive session, the Presentation concluded with a Vote of Thanks proposed by Mr T. R. Rajasekhar, Consultant to the speaker for having taken pains for the preparation of the wonderful presentation and to all the participants for their attention.

Deepak Vidyarthi
Chairman, Training, Development and Program Committee of MEAI

MEJ RIDDLES

Dear Readers of MEJ,

In order to increase the readership of MEJ, which has been felt essential in the interest of our ardent members, the mineral industry professionals as well as the mining sector, the Editorial Board of MEJ has decided to hold a monthly QUIZ. The monthly QUIZ will be designed and printed in MEJ based on the content published in the previous month's MEJ. The MEJ readers will be given five objective questions with multiple choices to choose; and expect them to respond with their correct answer by email to the Editor at **editormejmeai@gmail.com** by 20th of the current month. If more than three members responded with the correct answers, then the three winners will be decided by draw. Each winner will be issued a certificate of merit and a nominal cash prize of Rs 500.

Encourage the EMJ readers to participate in the QUIZ in large numbers and benefit from the enhanced knowledge by reading the Journal from the first to last page.

Questions based on September 2023 issue

1. Which mining company is the sole producer of diamonds in India?

(a) NMDC Limited (b) HZL
(c) Tata Steel (d) Baldota

2. Who was the 32nd President of MEAI?

(a) Mr K Madhusudhana (b) Mr SN Mathur
(c) Mr Sanjay Pattnaik (d) Mr Arun K Kothari

3. Which ESG issue that affect the most between investors and governments as per CRA survey?

(a) Human rights violations (b) Tailings management
(c) Water usage (d) Local community

4. As on date, how many coal blocks were successfully auctioned under commercial auctions?

(a) 82 (b) 72
(c) 102 (d) 92

5. Whom did Prof CS Pichmuthu call as a 'born geologist'?

(a) Mr Pinagali Venkaiah (b) Mr V Ball
(c) Sir CV Raman (d) Mr WW Francis

WINNERS OF RIDDLES PUBLISHED IN THE MEJ SEPTEMBER 2023 ISSUE

Congratulations to proud winners

Mr GVVG Krishnarao

Hyderabad -500 055, Email: gvvgkrao@gmail.com

Dr Pradeep Kumar Jain

Chief Mineral Economist, IBM (Retd.) and Consultant, EMail: pkjain3661@gmail.com

Mr BS Patel

Advisor (P&M), PMILLP, bspatel54@gmail.com

To receive the cash prize of Rs 500, the winners may please contact the Secretary General, MEAI on email at **meai1957@gmail.com** or Mob. 9177045204.

CONFERENCES, SEMINARS, WORKSHOPS ETC.

INDIA

6-7 Oct 2023: **International Seminar on Minerals: A Resource for Energy and Food Security**. Jaipur. For details, Contact – Mr Anil Mathur on Mob 9414119227, E-mail: chairman.jaipur@meai.org & meaijpr2010@gmail.com

6-9 Nov 2023: **International Mining, Equipment & Minerals Exhibition (IME 2023)**. Eco Park, Rajarhat, Kolkata, India. Organised by The Mining, Geological & Metallurgical Institute of India (MGMI). Contact Email ID: miningexpo@tafcon.in

ABROAD

25-28 Oct 2023: **China Coal & Mining Expo 2023**. China's 20th International Technology Exchange & Equipment Exhibition on coal and mining is the largest international coal and mining exhibition in Asia. New China International Exhibition Center (NCIEC), 88 Yuxiang Road, Tianzhu Airport Industrial Zone, Shun Yi District, Beijing, China

31 Oct - 2 Nov 2023: **International Mining and Resources Conference (IMARC)**. Sydney, Australia. Contact: connect@imarcglobal.com. Phone: Australia: +61 (0) 3 9008 5946

6-9 Nov 2023: Flotation '23. The Vineyard Hotel Colinton Rd, Newlands, Cape own, 7700, South Africa. Contact details: 15 South Street, Farnham, Surrey, GU9 7QU, United Kingdom, Tel: +44 (0)1252 718 999, Email: enquiries@globalminingreview.com

8-9 Nov 2023: **International Conference on Underground Mining Methods and Technologies ICUMMT 2023**. Istanbul, Turkey. Website URL: https://waset.org/underground-mining-methods-and-technologies-conference-in-november-2023-in-istanbul

15-16 Nov 2023: **International Conference on Design Methods in Underground Mining ICDMUM 2023**. Jeddah, Saudi Arabia. Website URL: https://waset.org/design-methods-in-underground-mining-conference-in-november-2023-in-jeddah

21-23 Nov 2023: **Critical Minerals Conference 2023**. Perth Convention & Exhibition Centre, Perth, Australia. For details contact conference@ausimm.com

28-30 Nov 2023: ResourcingTomorrow 2023. Business Design Centre 52 Upper Street, London , N1 0QH, United Kingdom. Contact details: 15 South Street, Farnham, Surrey, GU9 7QU, United Kingdom, Tel: +44 (0)1252 718 999, Email: enquiries@globalminingreview.com

01-02 Dec 2023: **International Conference on Design Methods in Underground Mining ICDMUM**. Auckland, New Zealand. Website URL: https://waset.org/design-methods-in-underground-mining-conference-in-december-2023-in-auckland.

10-11 Jan 2024: **Future Minerals Forum (FMF 24)- Conference and Exhibition**. VENUE KING ABDULAZIZ INTERNATIONAL CONFERENCE, CENTER, RIYADH, SAUDI ARABIA. For Speaking Enquiries speaker@futuremineralsforum.com.

11-12 Jan 2024: **International Conference on Mineral Processing and Mining ICMPM 2024**. Singapore. Organised by World Academy of Science, Engineering and Technology. Website URL: https://waset.org/mineral-processing-and-mining-conference-in-january-2024-in-singapore

8-9 Feb 2024: **International Conference on Web Mining, Information and Knowledge Extraction (ICWMIKE 2024)**. Lisbon, Portugal. Website URL: https://waset.org/web-mining-information-and-knowledge-extraction-conference-in-february-2024-in-lisbon; Contact URL: https://waset.org

18-19 Feb 2024: **International Conference on Bauxite Mining and Alumina Refining ICBMAR 2024**. Jeddah, Saudi Arabia. Website URL: https://waset.org/bauxite-mining-and-alumina-refining-conference-in-february-2024-in-jeddah

4-5 Mar 2024: **International Conference on Mining Intelligence ICMI 2024**. Rio de Janeiro, Brazil. Website URL: https://waset.org/mining-intelligence-conference-in-march-2024-in-rio-de-janeiro

4-8 Mar 2024: **The 17th ACM International Conference on Web Search and Data Mining (WSDM)**. Event Location: Mérida, Yucatán. Contact wsdm-2024-general-chairs@googlegroups.com

10-13 Mar 2024: EnviroTech Lisbon, 2024 - cement conference. Hotel Cascai Miragem Health & Spa, Av. Marginal 8554, 2754-536 Cascais, Lisbon, Portugal. Contact details: 15 South Street, Farnham, Surrey, GU9 7QU, United Kingdom, Tel: +44 (0)1252 718 999, Email: enquiries@globalminingreview.com

22-23 Apr 2024: **International Conference on Recent Developments in Mining Technologies ICRDMT 2024**. London, United Kingdom. Website URL: https://waset.org/recent-developments-in-mining-technologies-conference-in-april-2024-in-london

23-25 Apr 2024: Exhibition Mining World Russia. 28th exhibition of machines and equipment for mining, processing and transportation of minerals. Moscow, Crocus Expo, pavilion For details contact: Ms. Natalia Medvedeva, Portfolio Director, ITE Group, Email: natalia.medvedeva@ite.group. Web link: https://miningworld.ru/en/media/news/2023/august/17/equipment-for-mining-industry-in-russia.

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