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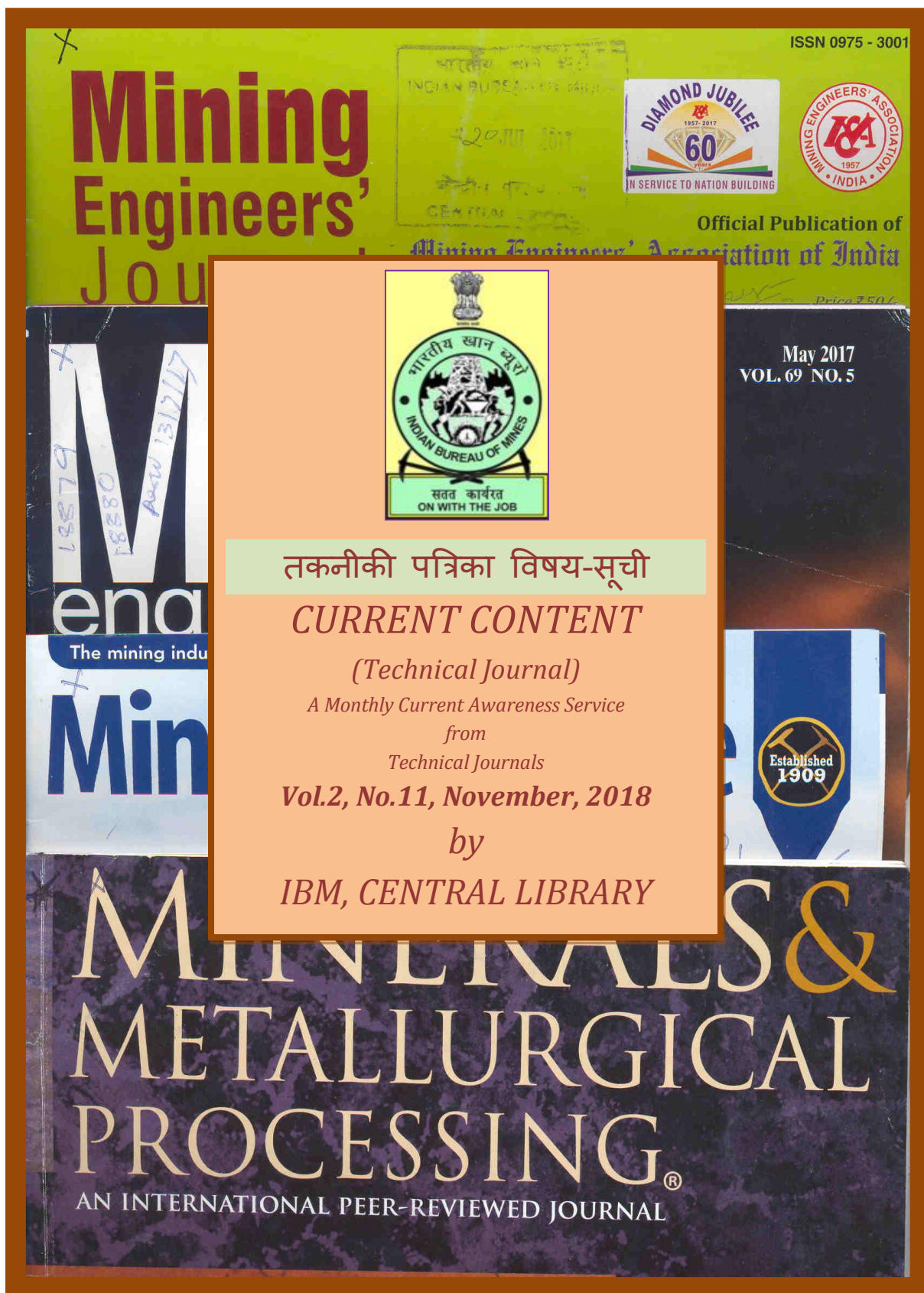
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Vol.2, No.11 November, 2018

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of the cover date for replacement at no charge.

ECGLAL 113(5) 1007-1224

ISSN 0361-0128

Iron & Steel Review, Vol.62 No.5, October 2018

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Editorial & Corporate Office:
Merlin Links, Block 5E/5F, 5th Floor
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Kolkata - 700 026
Phone: 91-033-2465-8581/9406
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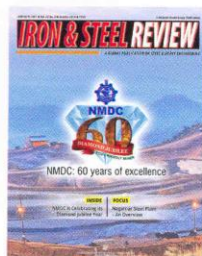
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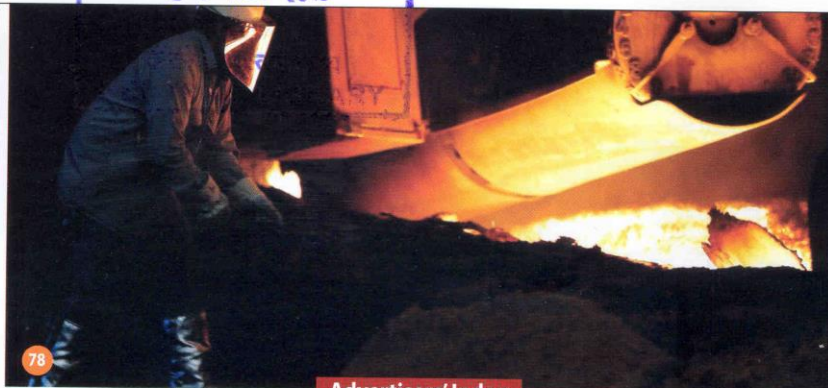
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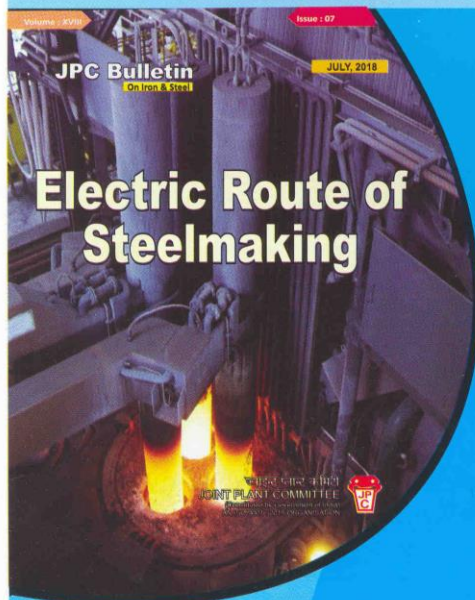
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BULLETIN ON IRON & STEEL

Volume : XVIII
Issue : 09

JPC Bulletin
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AUGUST, 2018

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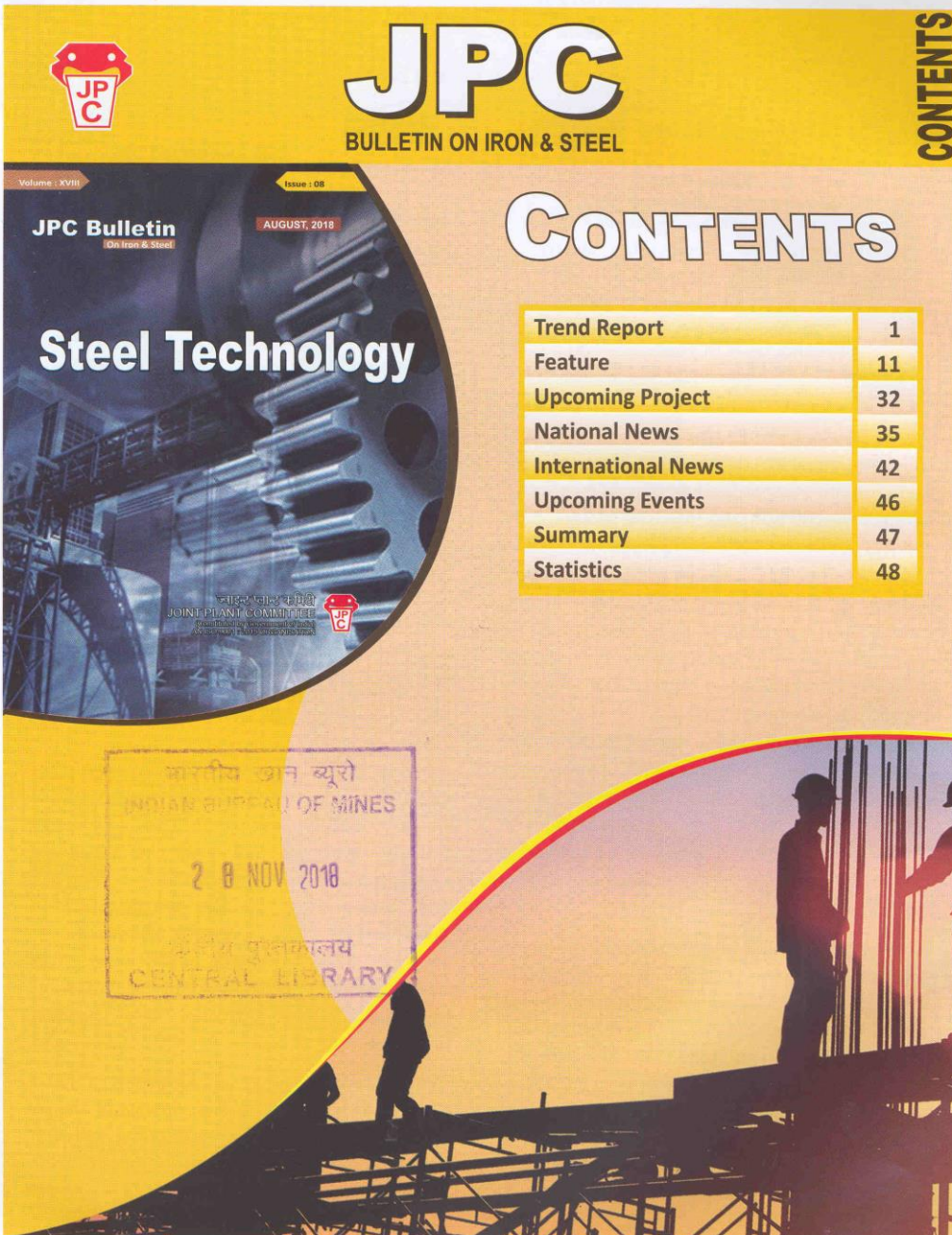
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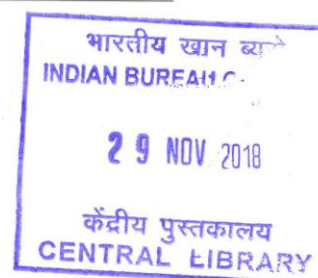
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**Western Ghats:
Evolution and Environmental Issues**

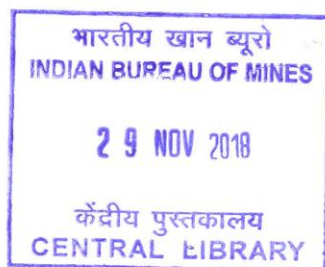
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Email: editorjournalgsi@gmail.com; jgsi.journal@gmail.com; **Mobile:** 09341264052;
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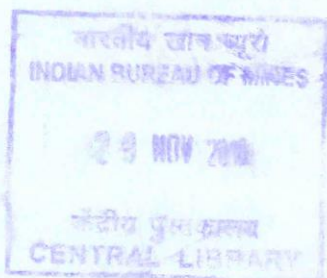
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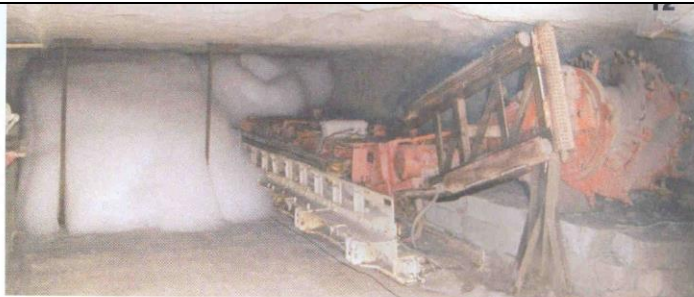
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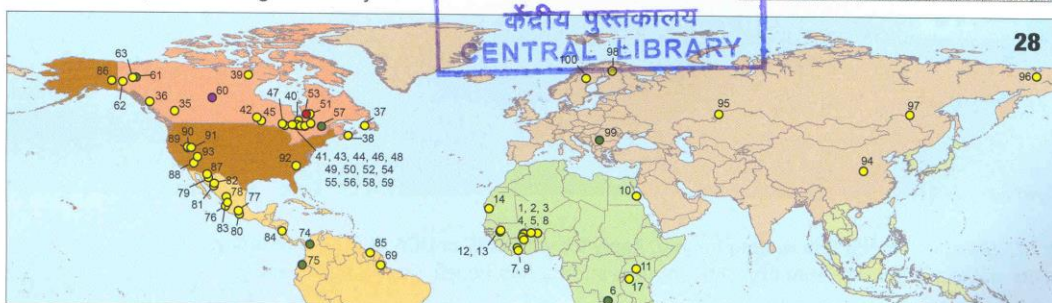
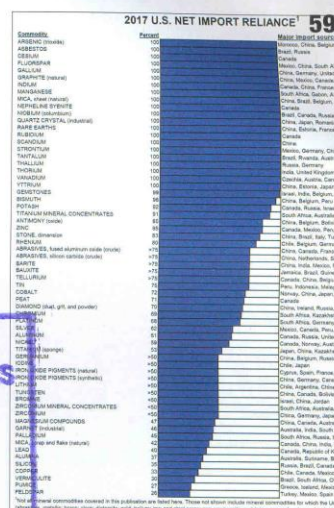
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Mining engineering

OFFICIAL PUBLICATION OF SME
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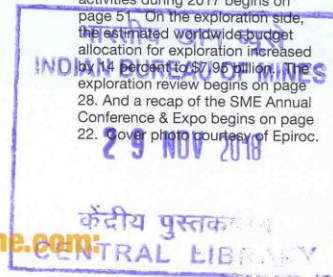


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The value of metals produced in the United States during 2017 increased by about 12 percent, while the value of industrial minerals produced domestically increased by 3 percent, according to the U.S. Geological Survey. The estimated value of domestically produced minerals last year reached \$75.2 billion, including metals and industrial minerals. That was a jump from \$70.8 billion in 2016. The annual review of mining activities during 2017 begins on page 51. On the exploration side, the estimated worldwide budget allocation for exploration increased by 14 percent to \$7.96 billion. The exploration review begins on page 28. And a recap of the SME Annual Conference & Expo begins on page 22. Cover photo courtesy of Epiroc.



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Editor

Steve Kral
kral@smenet.org

Senior Editor

William M. Gleason
gleason@smenet.org

Senior Editor

Georgene Renner
renner@smenet.org

Managing Technical Editor

Chee Theng
theng@smenet.org

Production Graphic Artist

Ted Robertson
robertson@smenet.org

Business Staff

Media Manager/Advertising
Ken Goering
goering@smenet.org

Phone: 1-800-763-3132

Fax: 1-303-973-3845

Email: goering@smenet.org

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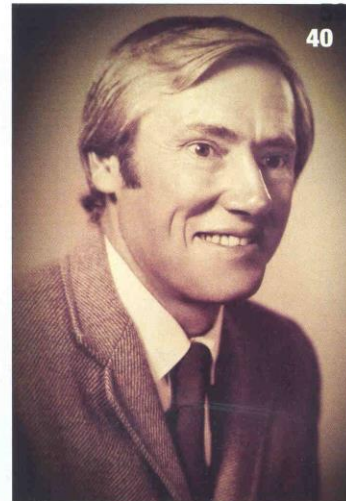
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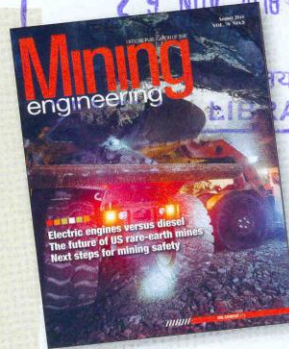
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AUGUST 2018
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In This Issue

The first priority of every mine operator is to create and maintain a safe and healthy work environment for miners. Part of that challenge is monitoring the air miners breathe while working in hot underground mines. Jon Fox, August Greth and Karoly Kocsis examine how the use of electric engines versus diesel can lead to a safer, and more profitable operation on page 16. Speaking of safety, some of the world's leading experts in mine safety and health were at the 2018 Holmes Safety Association meeting. Read our recap on page 38. The U.S. rare-earth sector is not what it once was, but there is still potential in the United States. George Barakos, Helmut Mischo and Jens Gutzmer look at the sector on page 30. Cover photo from Shutterstock.

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kral@smenet.org

Senior Editor

William M. Gleason
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Senior Editor

Georgene Renner
renner@smenet.org

Managing Technical Editor

Chee Theng
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Ted Robertson
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Business Staff

Media Manager/Advertising
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OFFICIAL PUBLICATION OF SME
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Mining engineering

OFFICIAL PUBLICATION OF SME
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SEPTEMBER 2018
VOL. 70 NO. 9

5,426 Btu/lb	Stone used to make roads, building foundations, landscaping, concrete, and crushed and dimensioned stone.	13 Btu/lb	Copper used in building, electrical, and electronic equipment.
5,720 Btu/lb	Sand & gravel used to make concrete, asphalt, roads, tracks & bricks.	11 Btu/lb	Lead used in transportation, batteries, electrical, and construction.
550 Btu/lb	Crushed stone used to make roads, concrete, asphalt, tracks & bricks.	6 Btu/lb	Zinc used to make galvanized steel, batteries, brass, and other alloys.
244 Btu/lb	Iron ore used to make steel.	34 Btu/lb	Gold used to make jewelry, electronics, and other alloys.
318 Btu/lb	Ball used in various industries, including mining, steel, and agriculture.	4 Btu/lb	Manganese used to make steel, batteries, and other alloys.
195 Btu/lb	Fluorapatite Rock used to make fertilizers and other products.	530 Btu/lb	Other materials used in various industries.
147 Btu/lb	Slag used to make bricks, cement, and other products.	21 Btu/lb	Other materials used in various industries.
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• 530 gallons of Petroleum
• 87,817 cu. ft. of Natural Gas
To generate the energy each person used in one year—

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Recently, various digital technologies have resulted in several synergies to deliver innovation in diverse applications. The mining industry, however, has been relatively slow in adopting these technologies compared with other industries. Steyn, Bascor and Gorain discuss transforming plant data into actionable insights, page 18. Warman (Weir) has been a major factor in the global mining industry, ever since Charles Warman invented his slurry pump. The company celebrates 80 years, page 30. What is the primary responsibility of geotechnical engineers in mining? Beginning on page 32, R.J. Sheets relates some of his experiences as a young geotechnical engineer in order to assist new geotechnical engineers prepare for the challenges they will face. Shutterstock cover photo.

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Editor
Steve Kral
kral@smenet.org

Senior Editor
William M. Gleason
gleason@smenet.org

Senior Editor
Georgene Renner
renner@smenet.org

Managing Technical Editor
Chee Theng
theng@smenet.org

Production Graphic Artist
Ted Robertson
robertson@smenet.org

Business Staff

Media Manager/Advertising
Ken Goering
goering@smenet.org

Phone: 1-800-763-3132

Fax: 1-303-973-3845

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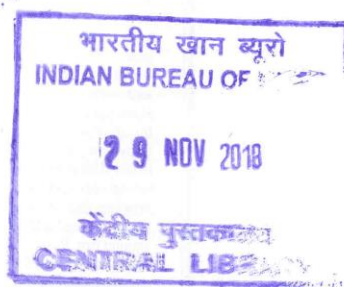
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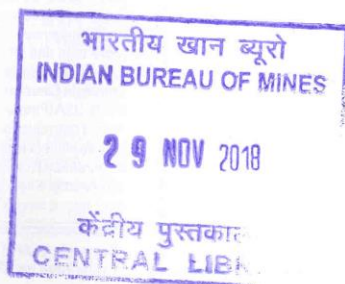
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Mining Magazine, September, 2018

Good management

Welcome to the management and leadership issue, *Mining Magazine's* fourth themed issue of 2018. These are important topics for the mining industry, especially now as it is encountering an unprecedented number of challenges that are strongly influenced by a decade of incredible and rapid technological evolution.

Management starts at the earliest stages of the mining cycle, but it applies to the workforce as much as the mines themselves. Turn to page 53 for a great interview with Global LK's Laraine Kaminsky about the importance of diversity and inclusion management in the mining industry. She states: "A mining company that is open to being more diverse and more inclusive is one that is ahead of the game."

Mining is an industry that is often thought of as being 'pale, male and stale', a reputation that has not been without foundation historically. According a Bloomberg article published in May, the mining industry significantly lags behind other sectors on female representation, with approximately 20% of the workforce being female – a figure that is even lower in management. However, things are changing – the same article noted that female directors at mining companies in the Bloomberg World Index has risen to 13% from 5% in the past five years. All the global mining companies apart from Codelco have at least one woman on the board.

There have also been some high-profile proclamations of diversity goals, such as an announcement from BHP's CEO Andrew Mackenzie in 2016 that the company is aiming to 'achieve a gender-equal workforce by 2025'. As Kaminsky points out: "Why would you deselect 52% of the population, and only look at 48%?"

The mining industry also needs to appeal to students and workers, as a severe impending skills shortage is predicted – as many as 40% of the workforce in mining and metals are preparing to retire in the next few years. On page 28, Donna Schmidt investigates how universities are preparing to train the next generation of mining leaders.

MM's sister publication, *Mining Journal*, covers management and leadership issues in some depth as well. Its recently published inaugural *Mining Journal Global Leadership Report: Preparing for Transformation* discusses the need to transform the way that the mining industry operates to properly leverage new technologies and tackle issues including more sophisticated stakeholder engagement, the 'discovery deficit', and attracting new talent.

Chris Cann, head of Aspermont Research & Intelligence, said in the report that its aims "to shine a light on the process of business transformation in the mining industry."

He added that it intended "to prioritise the most desirable leadership attributes in the current environment, along with the greatest threats and opportunities from the perspectives of both the overall industry and individual companies".

As part of its research, the team secured interviews with executives, mostly chief executives or equivalent, from 21 mining companies with a combined market capitalisation of US\$367 billion, while the digital survey recorded responses from 518 industry professionals.

The resulting report is a complete review of the various factors that drive transformation, engagement levels between leadership groups and their employees on transformation messaging, leadership planning for the future, and the success rate for change programmes. It also includes an assessment of desirable leadership traits, threats and opportunities, which is a valuable read for anyone in mining management.



AILBHE GOODBODY, DEPUTY EDITOR
ailbhe.goodbody@miningmagazine.com Twitter: @MM_DepEd_Ailbhe



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Next month (October)

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COVER

DINGO, the global leader in predictive maintenance, just launched the Trakka Asset Health Management App™. This groundbreaking app enables mine operators to access, understand, and act on their equipment's condition – anytime, anywhere. Built by Dingo's award-winning software development team, this new Trakka app is part of a comprehensive suite of applications that provide a platform for equipment operators to see equipment health at a glance, recommend a course of action, and then track the progress through issue resolution, all from their mobile devices. For more information visit www.DINGO.com.

Mining Magazine, October, 2018

The future of mining is here...

October marks the launch of Aspermont Media's first annual Future of Mining Americas event, which will take place on October 29-30 in Denver, Colorado, US. It aims to bring together C-suite, heads and managers of mine operations, METS and support services from top enterprises around the globe to debate and define the current and future mining landscape, including discovering the latest innovations and technologies that are spearheading mine productivity, efficiency and safety.

The event will feature expert speakers from leading companies across the global mining industry, talking about the future trends in the industry around the themes of exploration, development, management, infrastructure and leadership.

It follows the inaugural Future of Mining Sydney conference, which took place on May 14-15 at the SMC Conference Centre in Sydney, Australia. With over 80 speakers presenting and over 400 senior mining executives attending, the event was a great success and we've had wonderful feedback from those in attendance.

Some of the questions being posed at Future of Mining Americas that will be addressed include:

- How will mining be disrupted in the next decade?
- How will autonomy and technology change our view of the average 'miner', and how will this transformation actually happen?
- How is the mining industry raising the bar using Business Ecosystems to accelerate the pace of innovation?
- How can the global mining industry collectively work towards a positive culture shift, and how can mining companies prepare for the future by developing an agile talent base?
- What are the key strategies for building and maintaining relationships with governments and communities, as well as the impact of stricter regulations, tightening stakeholder engagement and regional rights for the indigenous population?
- How are miners creating a new positive brand image, free of past industry stigmas?
- How can transparency and communication be used as an image builder rather than a destroyer?

"How are miners creating a new positive brand image, free of past industry stigmas?"

Along with the presentations and panels, one of the greatest advantages of this event will be the small-group knowledge exchanges that will be curated and run on key issues to encourage collaborative problem-solving and growth, enabling attendees to have in-depth, open discussion with peers.

This exciting event was developed in close consultation with the editorial staff of *Mining Magazine* and our sister publication *Mining Journal*. In the run up to its launch, we have been running exclusive pieces on the *Mining Magazine* website (www.miningmagazine.com) related to the event including opinion pieces, case studies and interviews with key speakers and panellists from the mining industry.

Not only that, but editorial staff will be on site – I will be attending along with online editor Nia Kajastie and US-based senior reporter Donna Schmidt, so you can expect news coverage and Twitter updates, as well as interviews with some of the important industry leaders there.

You can find the latest information on the event website (americas.future-of-mining.com), our dedicated Twitter account (@FutureOfMining), as well as live Twitter updates from the event itself under the hashtag #FOMAmericas. We look forward to seeing some of you there!

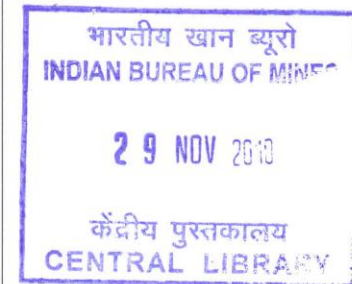
AILBHE GOODBODY, DEPUTY EDITOR

ailbhe.goodbody@miningmagazine.com Twitter: @MM_DepEd_Ailbhe



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Next month (November)

The mine optimisation issue:

- Water management
- Concentrator and process design
- Blast optimisation incl. explosives and initiation systems
- Predictive analytics and machine learning



Mining Magazine, November, 2018

Breaking the paradoxes

Strategies for optimising any business, including those in mining, involve using emerging technologies to maximise efficiency and streamline the value chain.

One such area is Industry 4.0, the umbrella term for technologies including automation, data exchange, process control, the Internet of Things (IoT), cloud computing, machine learning and artificial intelligence (AI). The aim is to shape an industrial world of cyber-physical systems around principles such as interoperability, information transparency, technical assistance and decentralised decision-making.

Deloitte Global recently released a report, 'The Industry 4.0 paradox: Overcoming disconnects on the path to digital transformation', that was based on a global survey of 361 executives in 11 countries. It found that while businesses in a range of industries plan to invest heavily in digital transformation, strategic and operational disconnects (or paradoxes) can threaten to hamper these efforts.

The survey revealed a mix of enthusiasm and ambitious plans for future investment, as well as some disconnects between companies' plans and actions.

The report authors noted that paradoxes can be observed around strategy, supply chain transformation, talent readiness and drivers for investment. They added: "This suggests that the will for digital transformation remains strong, but organisations are largely still finding a path that balances improving current operations with the opportunities afforded by Industry 4.0 technologies for innovation and business model transformation."

For example, in terms of strategy, nearly everybody who responded (94%) said digital transformation is a top strategic objective. However, understanding its strategic importance didn't translate to fully exploring the strategic possibilities it allows; only 68% saw it as an avenue for potential profit. Respondents also recognised the supply chain as a top priority for digital transformation. Despite this, only 22% of supply chain executives and those directing day-to-day business operations have input on decisions about investment in such initiatives. Most reported feeling confident in having the right talent in place to support digital transformations – only 15% felt they needed to dramatically alter the composition and skill sets. At the same time, they pointed to finding, training and retaining the right talent as their top cultural and organisational challenge.

Executives also reported using advanced technologies for near-term business operations, at least initially, rather than truly transformative opportunities. However, organisations that are driven by other factors, such as increased desire for innovation and internal strategy focus, reported an equally positive return on investment.

Finally, the ability to fully harness information from connected assets and use it to drive informed decisions is important to the full realisation of Industry 4.0. The authors point out that this is an aspect that many organisations are not fully able to execute.

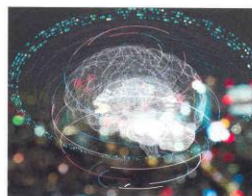
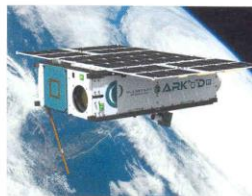
The report suggests that there is no single way to successfully implement Industry 4.0, but the authors recommended that digital transformation is not an abstract endeavour that is separate from core organisation strategy and purpose; it does not have a single definition; it may profoundly affect talent; and the culture of digital transformation should be inclusive.

"The changes digital transformation may bring about ... will evolve, perhaps in ways no one could have anticipated," they concluded. "This is to be expected as the foundational technologies that comprise Industry 4.0 and drive digital transformation, themselves, evolve at an ever-faster pace. But it seems almost certain that, however that evolution unfolds, the era of Industry 4.0 is here."

AILBHE GOODBODY, DEPUTY EDITOR

ailbhe.goodbody@miningmagazine.com Twitter: @MM_DepEd_Ailbhe

"The survey revealed a mix of enthusiasm and ambitious plans"



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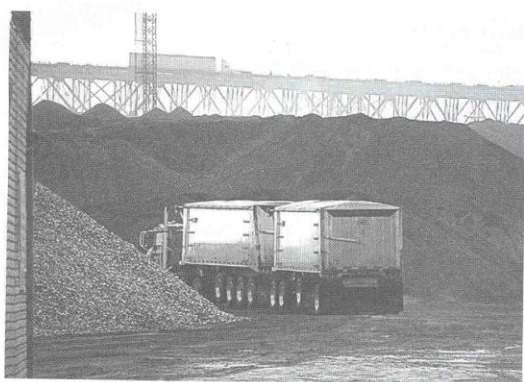
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Next month

3-D printing
Underground load and haul
Mine closure and estate planning
Fatigue monitoring and operator safety

COVER

Motion Metrics is a leader in developing AI-based solutions for the Mining industry. Their latest solution, BeltMetrics™, supports mine to mill optimisation by helping to identify operational inefficiencies from blasting through to crushing. Using a rugged, stereo camera mounted above the belt and artificial intelligent algorithms, accurate fragmentation analysis results can be shared with mine management in real time. Empty belts can also be detected, alerting management of possible blocked chutes or screens.
www.motionmetrics.com



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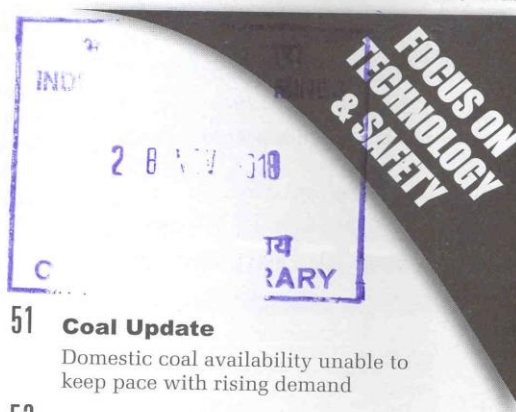
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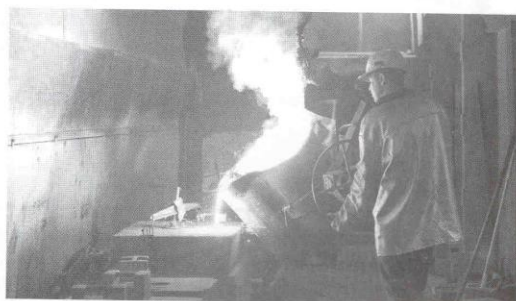
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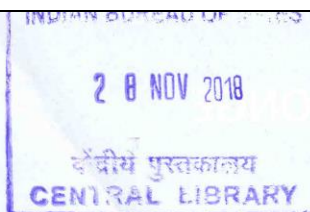
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Mining Engineers' Journal



Official Publication of
Mining Engineers' Association of India

Vol. 20

No. 4

MONTHLY

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Correspondence Address

MEAI National Headquarters

Contact: **Secretary General,**

Mining Engineers' Association of India

F-608 & 609, Raghavaratna Towers, 'A' Block, VI Floor,

Chirag Ali Lane, Abids, Hyderabad - 500 001.

Ph.: 040-66339625, 23200510

E-mail : meai1957@gmail.com

website : www.meai.org

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Guest editor: Carlo Pietrobelli and Jocelyn Olivari

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0301-4207(201810)58:C;1-S

This Journal is abstracted/indexed in *Current Contents/Social & Behavioural Sciences*, *Social Sciences Citation Index*, *Research Alert*, *Contents of Recent Economic Journals*, *PAIS Bulletin*, *The International Bibliography of Social Sciences*, *Geo Abstracts*, *The International Current Awareness Services*, *Environment Abstracts* and *Enviro/Energyline Abstracts Plus*. Also covered in the abstract and citation database Scopus®. Full text available on ScienceDirect®.

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