



तकनीकी पत्रिका विषय-सूची

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Vol.4 No.09, September, 2020

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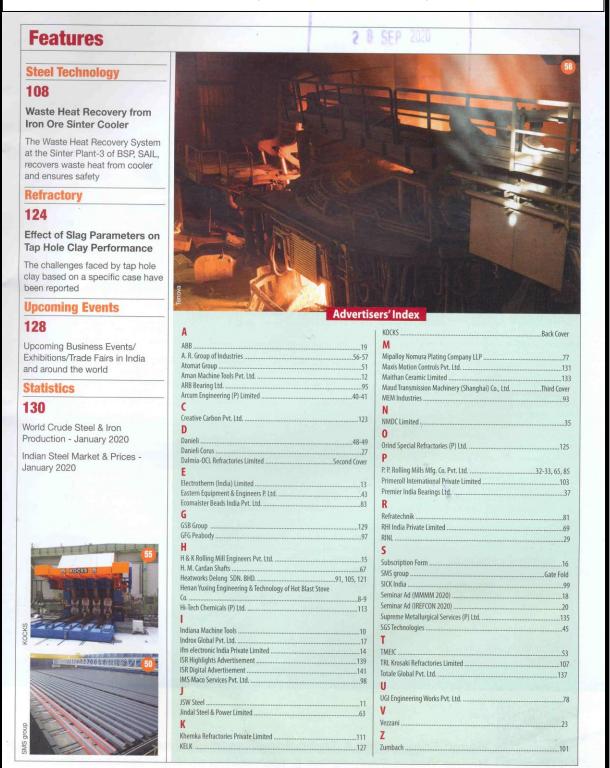
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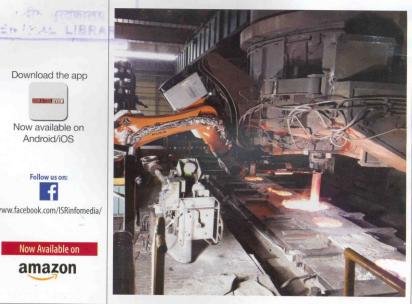
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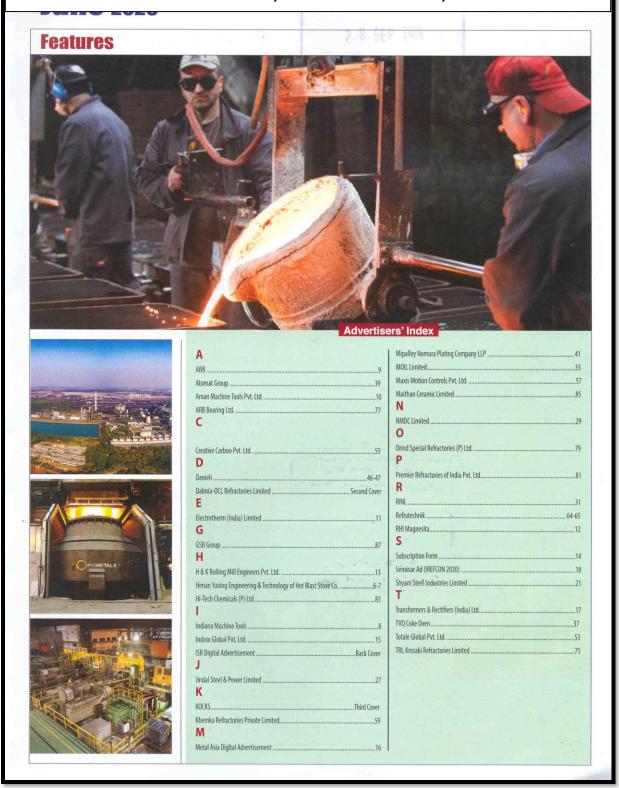
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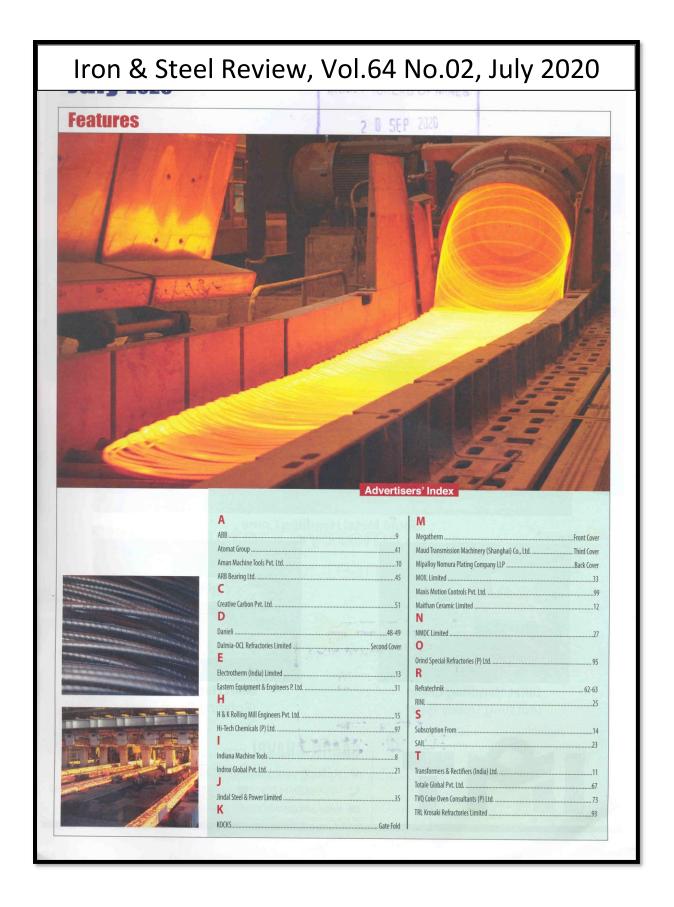
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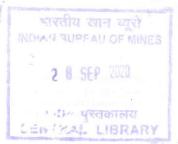
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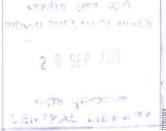
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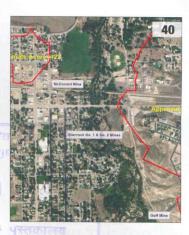
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Water management for mining companies around the world is critical. Many companies are mandated by their membership in the International Council on Mining and Metals to comply with best practice framework for sustainability. On page 26, Dennis Gibson and his coauthors write about enhancing sustainability through the optimization of water systems. The shift to battery electric vehicles in underground mining has led to improved air quality and productivity. Franck Boudreault writes about the growth of electric vehicles in mining on page 34. SME Managing Technical Editor Chee Theng took part in a short course offered at the Colorado Shool of Mines, and she provides a day-by-day recap on page 40. Cover photo courtesy of Black & Veatch.

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"The entire industry

reducing dam failures

can work towards

in the future"

Aftermath of a disaster: a year on

While writing this, it's been almost a year to the day since a tailings dam at $\overline{\mathbb{V}}$ ale's Córrego do Feijão iron ore mine in Brumadinho, Brazil, ruptured and spilled mine waste into the surrounding environment, killing more than 250 people.

The catastrophic event certainly hasn't been forgotten, and much work still remains to be done to find the real causes of the dam burst. In an internal report put together by independent counsel to the company, Vale outlined heavy seasonal rain, poor drainage and a brittle wall structure as contributing factors to the failure.

To mark the anniversary of the collapse, a group of 350 people, calling themselves the 'Movement of People Affected by Dam Collapses', also set out on a 300-kilometre march from Belo Horizonte to Brumadinho.

State prosecutors in Brazil have also brought murder and environmental charges against Vale and the tailings dam's safety auditor TÜV SÜD. Former Vale chief executive Fabio Schvartsman is among the 16 people facing

homicide charges.

The Global Tailings Review, working on a global tailings standard, finished the consultation phase of its draft at the end of 2019, and the aim is still to publish the final standard in 2020.

"A draft standard, which was the culmination of an initial research phase, was shared globally for public consultation in November 2019," said Bruno

Oberle, chair of the Global Tailings Review, in a statement.

"With the consultation conducted online in seven languages, and through in-person consultation in Kazakhstan, China, Chile, Ghana, South Africa and Australia, many constructive and helpful insights were received from a wide variety of stakeholders.

"We are currently in the process of analysing the comprehensive feedback received and balancing diverse stakeholder views to strengthen the standard."

Moreover, environmental organisation GRID-Arendal, which is part of the Investor Mining and Tailings Safety Initiative, has launched the world's first global database of tailings storage facilities.

"This portal could save lives," said Professor Baker, who is senior expert at GRID-Arendal globally. "Tailing dams are getting bigger and bigger. Mining companies have found most of the highest-grade ores and are now mining lower-grade ones, which create more waste. With this information, the entire industry can work towards reducing dam failures in the future."

Talking to consultants, engineers and contractors for this mining services-focused issue also brought home how incidents like this affect all levels of the industry. While technology and equipment suppliers have been working on tailings storage and management solutions for years now – seeing as this wasn't the first nor will it probably be the last tailings dam failure to unsettle the industry – some are still in the pilot stage or waiting for full commercialisation.

In this issue, we have also announced the winners of the 2019 Mining Magazine Awards, and it seemed only appropriate to highlight a technology, and the two companies behind it, that could make a difference in tailings dam monitoring and management. Accordingly, the Editor's Award this time goes to Inmarsat and Knight Piésold UK, which have combined IoT technology with consultancy to offer a new approach to the way tailings dams are currently audited and managed.

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The Carlson Cavity Auto-scanning Laser System (C-ALS) Gyro is a unique specialized, underground, laser cavity-monitoring system that enables the mapping of previously inaccessible parts of mines. The C-ALS Gyro system can be used to increase operation and exploration safety, assess risks, and design solutions. With the system's internal gyro, the C-ALS Gyro probe is able to orient itself upon a brief calibration prior to deployment. Operators can view recorded data in real time and incorporate it with future mine planning. Learn more at: http://info.carlsonsw.com/cals-gyro

www.MiningMagazine.com January/February 2020

Mining Magazine, March 2020

"The mining industry

equivalent of GHG

emissions annually"

generates between 1.9

and 5.1 gigatons of CO₂

Do the right thing

It is an interesting time to be talking to companies within the mining sector, whether this is miners, OEMs or service providers. Conversations often – without much prompting – turn to the sustainability credentials of projects, social implications and climate strategies.

ESG talk, of course, has been around for ages, but more on the sidelines rather than front and centre. It's no longer the realm of activists alone; mining houses, METS providers, investors and other stakeholders have joined the chorus.

Swedish mining company LKAB's senior vice president for market and technology Markus Petäjäniemi believes that the topic of carbon-dioxide emissions, while always there in the background, is now a focal point.

"We need to decrease our emissions," he confirms. "It's becoming more and more urgent that we need to do things around the world. That's why we decided on the LKAB board, and it's also committed on the Swedish government level, that we need to speak to the 2030 agenda [for sustainable development] commitments.

Nonetheless, according to a recent report from US consulting firm McKinsey on 'Climate risk and decarbonization in mining', the mining industry has only just started to set goals for emissions reduction.

"Current targets published by mining companies range from 0 to 30 per cent by 2030, far below the Paris Agreement goals," authors Lindsay Delevingne, Will Glazener, Liesbet Grégoir and Kimberly Henderson write

Importantly, when scrutinising the mining sector, we need to take into account the entire value chain, rather than just the mines themselves

"The mining industry generates between 1.9 and 5.1 gigatons of CO₂ equivalent (CO₂e) of GHG emissions annually. The majority of emissions in this sector originate from fugitive coal-bed methane that is released during coal mining (1.5 to 4.6 gigatons), mainly at underground operations. Power consumption in the mining industry contributes 0.4 gigatons of CO2e," the report says.

"Further down the value chain - what could be considered Scope 3 emissions - the metal industry contributes roughly 4.2 gigatons, mainly through steel and aluminium production. Coal combustion for the power sector contributes up to roughly 10 gigatons of CO2.

Patrick Marshall, vice president of product management at MacLean Engineering, thinks there is a "moral commitment" for the industry to look into solutions for decarbonisation. Of course, most miners are waiting to see the financial benefits of moving to, for example, battery-electric equipment.

The McKinsey report notes that electrification of mining vehicles is only now really starting to become cost-effective.

"Right now, only 0.5 per cent of mining equipment is fully electric. However, in some cases, battery-electric vehicles have a 20 per cent lower total cost of ownership versus traditional internal-combustionengine vehicles," it says

As such, the pace of decarbonisation efforts still seems fairly

However, with mining companies' licence to operate on the line, perhaps a sense of urgency will accelerate these developments. The industry is certainly now talking the talk.

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Dr. Merouane Rachidi P.Geo. of GoldMinds showing the high-grade native silver core of the first wedge programme of Canada Cobalt Works Castle Property at Gowganda, Ontario under GMG supervision. The interval runs 50,583 g/t Ag over 0.6m.

For more information, email: Info@goldmindsgeoservices.com

www.MiningMagazine.com March 2020

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Special Issue: John Tilton's 80th birthday

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