

Benefits of digitalisation for mining

Underground mines worldwide that are digitalising their operations are reaping benefits such as increased Health & Safety (H&S), productivity and sustainability.



Source: ©2020 Vedanta Zinc International: Aerial view of Black Mountain Mining

Black Mountain Mining (BBM) is one of mines that is increasingly digitalising their many underground operations worldwide.

"We are in an age where technology, innovation and digitalisation are the cornerstones of business growth and development," says Pieter Oosthuizen, chief digital and information officer, Vedanta Zinc International.

"At VZI, we continue to leverage digital solutions to improve our processes, performance and support data-driven and strategic decision-making," he adds.

BMM, located in the Northern Cape's Khaima region, comprises the Deeps and Swartberg underground operation as well as the Gamsberg open pit operation. It is part of VZI, a grouping of zinc assets located in South Africa and Namibia, part of the global mining and metal conglomerate Vedanta Limited, the world's sixth largest diversified resources company.

Digital innovation

In 2018, a modular digitalisation project aimed at loading and hauling operations was implemented at the Deeps operation. It has since created a platform to further expand in embracing the benefits of digital innovation.

The Swartberg mine is embarking on a complete digitalisation journey as part of the underground expansion project.

Digitalisation enables real-time data processing that facilitates immediate decision-making and performance monitoring of the operation, which will reduce an "after the fact" decision-making.

The Swartberg mine digital journey will create a range of opportunities emanating from safety, costs, productivity, and sustainability. Furthermore, Swartberg aims to utilise digitalisation to uphold VZL's first value of safety and pursue its vision of becoming a world-class, digitally-enabled operator.

Increased mechanisation through automation will allow employees less exposure to the working face with the minimal interface between man and machine.

"In addition to creating value for the business, the exposure associated with digitising our operations has led to an upskilled workforce. This reinforces our commitment to creating a culture of development at VZL and is in line with our philosophy of Business with Purpose," says Oosthuizen.

VZL is one of the largest employers in Northern Cape and employs 2,700 people directly and indirectly, of which 99% are local South Africans, 80% are from the Northern Cape and 60% from the Namakwa District, where operations are located.

From an equipment care point of view, digitisation will benefit Swartberg in anticipating failures and ensuring that machine health is prioritised for continuous sustainable mining. This will help reduce maintenance spending, prevent unplanned stoppages, and increase equipment availability.

"Our vision of safe, sustainable mining practices is achieved using data analytics to monitor the mining value chain from HSE to mill to logistics," says Oosthuizen.

Critical overall benefits:

- Improved safety standards and safety performance.
- Improved equipment utilisation, health, availability, and productivity.
- Improved planning and productivity.
- Reduced costs of production.

Further future benefits of the digitalisation drive include:

- Additional safety precautions (people movement tracking and ventilation on demand).
- Reduction in the carbon footprint through improved fuel efficiency and fuel management
- Process improvements across the mining and enabling services value chains.
- Improved planning capabilities (short, medium, and long term), including integrated planning.
- Improved operational performance management through digitalisation and advanced analytics.
- Improved heavy machinery and equipment health and availability through the introduction of advanced analytics and predictive maintenance
- Improved production exit rate to 1Mtpa by the end of FY22 (from 620Ktpa)