

# Bolstering mining safety through technology

Although the South African mining sector's safety record is improving, proper utilisation of technology could be a major boost for safety at mining operations.



Lukas van der Merwe

According to [statistics](#) on the safety performance of the mining industry in 2018, released by the Department of Mineral Resources, the sector recorded a 10% decrease in fatalities compared to 2017.

During the first two months of 2019, five fatalities were reported across South African mines, compared to 14 over the same period in the previous year. This represents a shift of 69%, which suggests the sector is improving its safety record.

While this is encouraging, both 2017 and 2018 saw more fatalities than in 2016, which means that more can be done to improve the industry's safety record.

## IoT and safety

Technology – especially the internet of things (IoT) – is instrumental to improving safety in mining environments, says Lukas van der Merwe, specialist sales executive: security, at T-Systems South Africa.

“It goes without saying that safety is crucial in mining. If anything goes wrong, people can die. While technology can do a

lot to improve safety, it is important to make the connection between technology, cybersecurity and the physical safety of mineworkers,” he says.

Traditionally operational technology (OT) – used to control physical processes, devices and infrastructure within an industrial environment – was owned and operated by engineers and was maintained and developed separately from IT.

“This used to be a completely isolated and closed system, only accessible by whoever was on the mine’s network and it had no internet connection. This means that the OT system was really simple to manage and to secure,” he says.

“However, once we bring in IoT and connect devices on an OT network so that they can be remotely managed and be accessible from anywhere, at any time, we increase the risk of cyberthreats and the possibility that these devices can be hacked.”

Many OT systems have been installed haphazardly over the past few years, with engineers often not knowing exactly what has been deployed, or which devices have been connected to the internet.

## **Cyber threats**

The proliferation of these devices has reached a critical mass in terms of the exposure it brings to the environment and is outside the engineers’ control or knowledge. So, this is where we need to look at IT cyberthreats that impact the OT environment. If an OT device is hacked, it can potentially kill people.

The obvious answer to this problem is to secure the network. “There are several solutions in this space. There are services and offerings that can scan the entire operational network and identify any and all potential threats and vulnerabilities to specific devices.

While this can often be done quickly and affordably, mine operators must start thinking beyond the benefits of IoT and consider the potential risks that cyberthreats pose for these disparate devices.

Van der Merwe notes that aside from the risks, the opportunities and benefits of IoT in mining are immense.

“Applying IoT in any industrial setting has significant potential to address the wellbeing of employees. The costs of this technology have changed, allowing devices and IoT to become prolific. These can be used to monitor and control air quality, temperature, pressure, impact or vibration,” he says.

He adds that IoT can help track where miners are in the event of a disaster, pinpoint where to look for them in case of a collapse, as well as help with understanding when air quality becomes dangerous and pre-empting possible events based on seismic detection.

“Many of the more advanced industrial operations around the world are now fully automated. Driverless vehicles are monitored and managed from remote locations. Preventative maintenance allows for the monitoring and replacement of components before they fail.

“IoT has had a significant part to play in this. Ultimately, if you take humans out of equation, it is the ultimate step in health and safety. However, cybersecurity then becomes crucial. The more you automate, the higher the risk,” van der Merwe concludes.