



SECURITY

Mining industry looks at new technology to address safety and production demands

Profits in South Africa's electricity-dependent mining industry, already undermined after last year's power outages brought it to a standstill for nearly a week, are under increasing pressure in the face of mounting labour and other costs.

An industry plagued not only by theft, but also fatal and serious injuries to its workers, is now looking at new technology to address safety and production demands in increasingly difficult operating conditions. The situation has been exacerbated by the recent release of a report by Minerals and Energy Minister, **Buyelwa Sonjica**, which showed mine safety compliance to be below target.

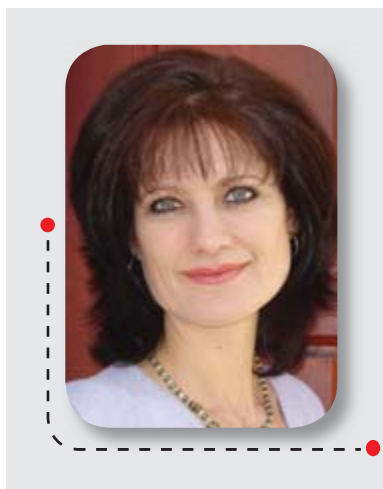
Accordingly, plans are brewing to amend the Mine and Safety Act of 1996 so that fines of up to R1-million or jail time of up to five years can be imposed on those found guilty of ignoring safety regulations.

Asked to comment on the way forward for the beleaguered industry which, like the rest of South Africa, is facing a 34 per cent hike in the price of electricity, **Nick Grange**, technical director of intelligent perimeter specialist company C3 Shared Services, says many mines are looking at thermal technology to help cut back on lighting costs without compromising the protection of personnel and assets.

"Theft has traditionally been the greatest challenge for any mine, whether petty cable theft or illegal mining. Now, however, power supply has also become a major problem. Many mines have had no choice but to cut back on electrical consumption by turning off lighting for a period of time, only to find when the lights come back on, their cable feeds have been stolen. Not only does this affect their production, it also results in expensive repairs."

NEW TECHNOLOGY

Thanks to new technology, there is light at the end of the tunnel, not only for the mining sector but all large industries. Says Mr Grange: "We're experiencing growing demand for systems that combine thermal cameras with intelligent video analytics, allowing for the detection and tracking



Ingrid Olivier
Special correspondent

of intruders 24 hours a day, regardless of surrounding lighting conditions."

Due to the vast expanse of mining operations, effective patrolling is difficult to ensure, hence the ongoing problem of theft and violation of machinery and cables, says **Dave Mitchell**, sales director of Magnum Shield Security. "While the actual value of the items stolen is generally low, it's the consequential loss that can be very significant. Manpower costs escalate every year, traditionally at a higher rate than that of CPI or inflation. By contrast, technology pricing is improving all the time, making it a very viable complementary service to guarding. The combination of manpower with technology offers the most effective solution, though it requires the services of higher calibre people and an on-going commitment to training."

As a result of the need to improve perimeter security on the mines, demand is rising for technology add-ons to CCTV systems, he says. Thermal cameras, having improved in both quality and pricing, are now in growing

demand as off-site monitoring solutions on the back of advances in H264 compression. "IP surveillance is certainly the trend in South African mining circles, not only because it's become far more affordable, but also because safety is the primary concern of every mine with a zero tolerance for non-adherence to safety regulations and rules," he maintains.

Though the mines are upping the ante when it comes to technology, Mr Mitchell insists that security companies and security officers remain vital components of their security plans. What's more, he says, they are playing an increasingly important role with regard to the implementation and enforcement of the mines' standing instructions and safety programmes.

"What makes it easier for crimes to take place undetected in mines is that these facilities are often located in remote areas," appends **Zane Greeff**, technical director for Elvey Security Technologies. "Take the theft of copper, which has reached such alarmingly high levels that it has been dubbed the 'Red Gold Rush'. And something else that needs to be urgently addressed by means of improved access control and tighter security is illegal mining. The prevention of unauthorised entry is a serious issue for the mines, which have traditionally relied on security guards on-site to keep under control. However, this option is not only costly but also very risky in terms of safety and vulnerability to human error."

GEOGRAPHIC REACH AND DELIVERY

According to Mr Greeff, the use of video verification over the GSM/GPRS cellular network offers two main advantages over traditional CCTV systems: geographic reach and speed of delivery. "The ability to deliver crime-in-progress footage across wide geographic distances anywhere on the cellular network has been the primary driver of GSM/GPRS-based systems to date for

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applications in mining environments or for the central monitoring of remote locations.”

The other major advantage of wireless video verification, he notes, is that it offers a complete wireless solution to existing and disused mines where access to electricity is either limited or not available.

“In these instances, an electronic security solution is not viable,” he points out, adding

that the evolution of video verification has progressed in such a way that it can operate on one set of batteries for a number of years.

In addition, images will only be sent to the control room or site managers when the system’s wireless passive infrared detectors are triggered. In so doing, operators will have an “eye-witness view” of what’s happening

as it happens.

VIDEO ANALYTICS

Another exciting development within the CCTV industry is video analytics, says Mr Greeff. “Video analytics is the technology used to analyse video for specific data, behaviour, objects or attitude. It’s an exciting area of innovation in security surveillance owing to its ability to handle intruder detection, perimeter protection and alarms. These intelligent capabilities help reduce false alarms in video surveillance, adding value to security monitoring in terms of more relevant and faster responses to incidences.”

OPEN INDUSTRY FORUMS

According to **Brian Wynberger**, Senior Product Specialist at Regal Security, the groundswell toward IP-based surveillance systems has prompted the formation of not just one, but two open industry forums, intended to develop a global standard for the interface of network video products. Though ONVIF (www.onvif.org) and PSIA (www.psialliance.org) were only formed last year, he says they have both released their first working implementations in the last six months.

Undoubtedly, IP will benefit the end-user through increased flexibility and greater freedom of choice, security of investment in future-proof systems, and a reduced total cost of ownership, says Mr Wynberger. However, while the standards around this technology are being refined, he expects that many users will opt for hybrid CCTV surveillance solutions that incorporate legacy analogue cameras, introducing IP cameras at a later stage as an upgrade.

A TYPICAL CCTV SYSTEM FOR A MINE

Says Mr Wynberger: “The advantage of megapixel cameras in the mining sector, which deals with precious resources such as diamonds, is that with the digital zoom capability they can now offer a much more detailed image of a possible theft, such as a worker putting a diamond into his pocket. IP cameras offer resolution which can be up to 12 times the clarity of traditional analogue CCTV systems. So, digitally zooming in 12 times, will offer a picture comparable to a high quality analogue CCD camera.”

When it comes to the creation of a typical

Protective clothing and continual training key to ensuring safe working practices

EVERY one of the more than half a million claims lodged with the Compensation Fund between April 2006 and December 2008 represents a human tragedy. So said Patrick Craven, National Spokesperson for COSATU (Congress of South African Trade Unions) in the wake of International Commemoration Day for Dead and Injured Workers, which was commemorated in South Africa on 8 May 2009.

According to Mr Craven, who maintains that health and safety at work is not an optional benefit but a basic human right, more than 14 million people took part in 10 000 activities across the world. “It is the day when we remember the over two million workers who die, the more than 1,2 million who are injured, and the more than 160 million who fall ill each year due to unsafe, unhealthy or unsustainable work and workplaces,” he said. “It is such a serious issue that we really ought to be talking about it every day. The International Labour Organisation (ILO) points out that the deaths at work are the equivalent of 6,000 workers dying each day, three persons every minute. If such casualties were occurring in wars there would be a deafening outcry.

But as ILO Director General Juan Somavia said in a message on this day last year, “Public awareness of occupational safety and health tends to be low and does not get the priority it merits, despite the fact that

occupational accidents and diseases cause great human sufferings and loss, and that the economic cost is also very high.”

Nick Grange, for one, agrees. “Health and safety, on the mines and in every other sector, has become a necessity. As company owners, we have to comply with the law, which exists not only for the protection of workers but also for owners since injury or illness impact on companies’ bottom lines and negatively affect productivity.”

Mr Grange, whose company has implemented the wearing of protective clothing as a standard, says this, along with continual staff training, is key to preventing accidents and ensuring safe working practices. “I think it’s good that the law is becoming tighter with regard to protective clothing. While many companies are complying with the safety standards, a lot are still not in compliance. Then, when someone gets injured, they try and cover up the incident to prevent an inquiry. What CEOs, owners and directors need to realise is that they will be liable for the costs of injury or death.”

“It’s therefore imperative that procedures and standards be implemented to ensure that safe practices are adhered to and complied with. At the end of the day, if correctly managed with risk assessments being carried out and the correct PPE (personal protective equipment) being worn, any industry can be rendered safe.” ■



FOCUS

mine security system using today's cutting-edge technology, Mr Wynberger believes it would incorporate cameras placed at strategic points throughout the property. "Undoubtedly, some would be positioned far away from the control room. This necessitates the use of either fibre optic cable or microwave wire links to get the video back to the control centre, bearing in mind that the latter is prone to electronic interference," he notes.

While the general tendency is to rely solely on CCTV (closed circuit television) as a crime prevention tool, it has some limitations on its own, says **Jack Edery**, chief executive officer of Elvey Security Technologies. "Firstly, it's reactive rather than proactive. And secondly, since mines often cover vast areas of open space with lots of hiding places, it becomes extremely challenging and costly, especially in the current economic downturn, to install cameras in every corner."

Adds Elvey's CCTV product manager **Francois Smuts**: "Demand for good security, high and growing, is behind an evolution in CCTV in which advanced video compression technology is enabling the delivery of high quality images from remote sites over any telephone or cellular line.

"A new concept, it is not replacing CCTV, but making surveillance more efficient and providing better value for money."

Easy-to-install, cost-effective and reliable, this solution offers video verification at a central station, video e-mail on events and even look-in capabilities. The technology is repeatedly proving its worth in terms of apprehending criminals, saving lives, improving revenue and reducing false alarms, he says. "It also reduces on-site guard requirements through automatically-scheduled video guard tours that can be viewed by central station operators. As a result, the viewer can see via automatically emailed video clips, someone entering a restricted area, who was with them and what, if anything, was carried in or out."

Mr Greeff is adamant that there is no better way to verify an alarm, unauthorised access or other life-threatening event than with video verification. "Event notification documents the chain of events at any location and at any time, whether attended or unattended. This is significant because it

allows security personal to manage a mine's security from a remote location."

THE FUTURE

Mr Grange has no doubt that IP open platform technology is the way forward for the mines when it comes to improving access control and security. "We've come a long way from the days when it was very difficult to integrate systems with third party devices and where we needed to have multiple components to achieve the same flexibility we can achieve with the present IP products," he says. "With today's IP platforms, we can integrate multiple encoder and IP camera brands as well as IP input concentrators, third party software protocols and commands. We also have the ability to add 3D maps with hotspot navigation from one camera to the next, both in live and replay modes."

Further, he says video analytics have come of age, successfully deployed to assist operators with viewing and responding to multiple video feeds. "Imagine you were an operator viewing eight screens, each with its own video feed. This would be the equivalent of viewing eight football or rugby matches simultaneously – an impossible task, yet one we ask operators all over the world to do every day. This is where video analytics steps in since it is able to alert the operator to a video feed that requires attention."

Mr Wynberger agrees. "The future of CCTV lies in the inter-operability of different products that can be seamlessly integrated. This will result in the major manufacturers implementing an open standards platform for their equipment."

Further to this, he says there's a strong interest in VCI (Video Content Analysis). "One of the major issues with regard to monitoring CCTV cameras on a permanent basis is that the cameras far outweigh the number of operators. According to ASIS International, a human can effectively watch 9-12 cameras for only 15 minutes. Security guard shifts are often 12 hours long, which translates to 11 hours and 45 minutes of ineffective monitoring in which a lot of relevant live footage stands to be missed. The principal of Video Content Analysis is that computers monitor all of the cameras all of the time and when something unusual happens, alerts the security guard." ■



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