

# Communication is king

**Implementing communication systems during construction that scale to production, meet security needs and corporate IT standards and are enterprise supportable is the way to go. Jamie Wade writes.**

If it's worth doing, it's worth doing well the saying goes. When it comes to communications infrastructure, the truism is particularly applicable. Communication is king at all stages of a project.

System integration providers such as CSC are being approached earlier by mining companies and Engineering Procurement Construction Management (EPCM) construction contractors wishing to plan ahead and get the most from the latest wireless and digital radio systems that can be used from construction to operation.

Both the EPCM construction contractor and the owner-operator want to get it right from day one, says CSC principal communications consultant Murray Wales.

"Many new mines previously had temporary or short term communications technologies, like analogue radio and ad hoc wireless networks," Wales told *Australian Mining*.



*There is a trend towards greater reaching, forward looking comms technology.*

"None were best practice, secure, enterprise supportable or met the corporate standard of the mine operator.

"When they were handed from the EPCM contractor to the mine operator, they needed to be upgraded or replaced with systems that

met the corporate architecture and standards going forward."

Workforce management like asset and people tracking and access control systems, says Wales, are being planned and implemented for day one of operations, not an add-on down the track when first production is taken care of and work force efficiencies are being sought.

"The key to getting it right is to plan early," Wales said.

"Implement systems during construction that will scale to production, meet the end operators corporate security requirements, corporate IT standards and are enterprise supportable. This reduces the need to replace these systems when the operator takes over which is not an uncommon event in the Natural Resources sector.

"We have seen the need to replace radio, LAN, WAN, wireless and voice telephony systems that the EPCM contractor has implemented



  
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for construction that are just not fit for purpose for an ongoing best-practice large global mining operator."

#### Trends and innovations

All mine sites have a requirement for Push to Talk (PTT) radio for safety, logistics and informational awareness, but these days more than just voice is wanted. New digital radios systems incorporate GPS, text SMS, expandable talk groups and advanced lone worker and safety priority calling. In Vehicle Management Systems (IVMS) for monitoring at-risk driver behaviour such as speeding, impact and heavy breaking can be monitored in real time by a central control room.

Geo Zoning and tracking of handheld radios that form part of an overall asset and work force safety system can be incorporated into a single source or 'view' on people and asset location. A training and access management system recently deployed by CSC at major coal mines includes worker training, induction validity and access rights to enter locations and operate specific equipment.

"These systems are now being required during construction, not only when the mine is operating; This is mainly because work force levels are typically double or triple of that required to operate a mine, and some of the activities during construction are equally hazardous," Wales said.

#### Access control

Integrated swipe-card based access management systems are now standard on most mine-sites to protect personnel from hazardous areas and secure commercially sensitive assets.

"Typically we are implementing systems that are fully-integrated to enterprise level systems like SAP, and automatically enforce compliance to training policies and fatigue management standards," adds CSC senior consultant – mining Jarrod Bassan.

"This means no-one gets onsite unless they have valid inductions and have not exceeded the maximum hours on site fatigue limit.

"Some sites are even extending their swipe-card systems to control access to electrical substations and other hazardous areas – only workers with the necessary electrical qualifications can enter the subs."

The latest advances are in personnel-awareness technologies which can accurately locate a person in the event of an emergency.

"During an emergency muster, we can not only determine accurately who's at the muster point, but we can locate the 'missing' workers to within a few metres – indoors, outdoors or

underground," Bassan told *Australian Mining*.

"These systems can also be turned on to track high-risk personnel like visitors or lone-workers, or to provide more accurate time-recording of contractors."

#### Today's demands

Effective communication infrastructure on site is becoming increasingly important as mine operators dig deeper and further. With some pre-strip and mine infrastructure projects running for years creating extensive open cut pits to reach ore bodies or coal seams, communication infrastructure has had to keep pace.

"The owner operator has an increasing input to ensuring the EPCM works towards best practice with systems to support the ongoing production activities brought on earlier, in this critical phase, to obtain the best possible outcome – on-time production."

"It also ensures that complex systems like Fleet Management Systems (FMS) and the associated intuitive self-healing wireless mesh communications infrastructure that support these mobile assets are well and truly 'burnt-in' before first production."

#### Challenges

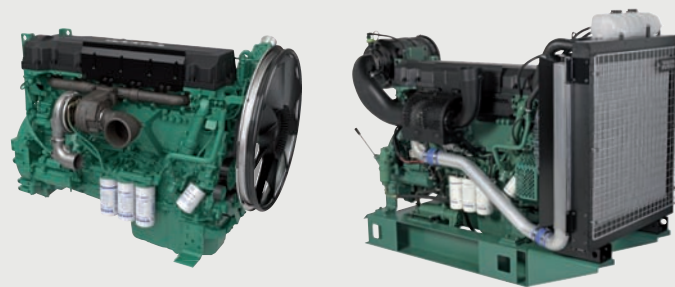
A remote mine site during early construction lacks pretty much everything: accommodation, communications, workshops, offices, roads and power. All are needed in the early days of construction. These systems and the supporting communications infrastructure are required to be easy and quick to deploy. Temporary infrastructure like trailer based satellite links back to corporate or Internet LAN access, wireless and digital radio systems are needed prior to fixed infrastructure being constructed – like towers, communication shelters and computer rooms. CSC has developed temporary container and trailer based wireless, communications rooms, radio and wireless mesh systems that can provide these systems early, during construction and even for exploration activities.

"Mines are increasingly being saturated with a multitude of wireless equipment running mission-critical applications – like truck-dispatch, remote telemetry, video monitoring, even autonomous vehicles," Bassan said. "However, it just takes one contractor to turn on a wireless device that uses the wrong frequency to cause interference and take-down these systems across site. Therefore, managing the radio frequency spectrum is critical. This is best achieved with good standards and good process for governance."

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# Nothing wasted on management

In days gone by waste was just one of the consequences of mining. Today, waste management demands close attention and serious consideration. Jamie Wade writes.

Waste material is a by-product of most industrial operations and its disposal, processing and treatment is a sensitive issue in the community.

From initial planning to exploration, project conception through to operations and process flows, mine closure, restoration and rehabilitation, waste management is ever present.

Attention and consideration to effective waste management is, therefore, an essential part of any mining operation today.

Mine operators can expect little sympathy and large fines – notwithstanding damage to reputation – from detrimental impacts on the environment from poor waste management.

A policy of inaction or just plain ignorance towards waste and its management is perilous, according to Tox Free Solutions business and technical development manager Chris Tanzer, who says the public and the environment must be protected from the potentially harmful effects of waste.

“Some waste materials particularly mining spoils and tailings dams are normally safe, but can become hazardous if not managed properly,” Tanzer told *Australian Mining*.

To date much of the progress in waste innovations publicly promoted through the media, says Tanzer, has been in the development of high-value new technologies to treat some of the more common wastes streams. However mine operators considering a waste management strategy can begin by simply



*Ignoring waste management issues can result in hefty fines for negligent miners.*

maintaining an emphasis on source separation of materials to minimise contamination which leads to the most efficient reprocessing of that material.

“There is strong evidence to suggest that there are many relative simple forms of innovation in waste management approaches that are at a less unit cost,” Tanzer said.

“These include education on effective waste prevention and minimisation strategies, source separation to eliminate cross contamination, and specific technologies for treating particular waste streams.

“Source separation is much more effective in conserving resources than relying solely on highly complex, expensive end-of-pipe technologies for managing a broad array of heterogeneous waste products.

“That said, there is a need for continuing research into improving recovery and reprocessing technologies,” he said.

The key challenge, he explained, is improving accessibility to these emerging technologies.

“This is more likely to be achieved by providing incentives to more efficiently collect and transport materials

to strategic locations for reprocessing, develop local and export markets for collected product and encourage industries and the community to embrace these schemes,” he said.

“Innovation is especially needed as economic and regulatory drivers seek to overcome disincentives to establishing advanced technologies close to populated centres that are producing the larger volumes of wastes.”

Also important for resource conservation are enforceable waste targets and green product design standards that enhance the recyclability of discarded items, according to Tanzer.

“In mining today, the key focus is on waste minimisation coupled with efficient and safe operations, environmental compliance and optimising recycling and beneficial reuses where practical.”

Some of the common waste management services in mining today include: recycling; landfill operations; education; industrial and chemical waste clean-up and disposal; plant maintenance and high pressure cleaning; sludge removal; hydrocarbon waste management and contaminated soil management.

Additional services include: soil sampling and tailings dam analysis; treatment and disposal of contaminated soil or contaminated waters; treatment of sludge and bi-products; Environmental Protection Authority (EPA) waste tracking; site waste audits; waste and environmental reporting; and future waste management modelling and planning.



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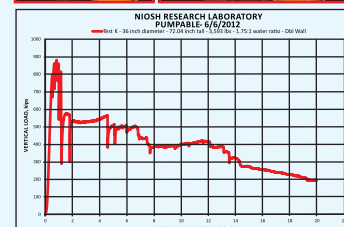
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