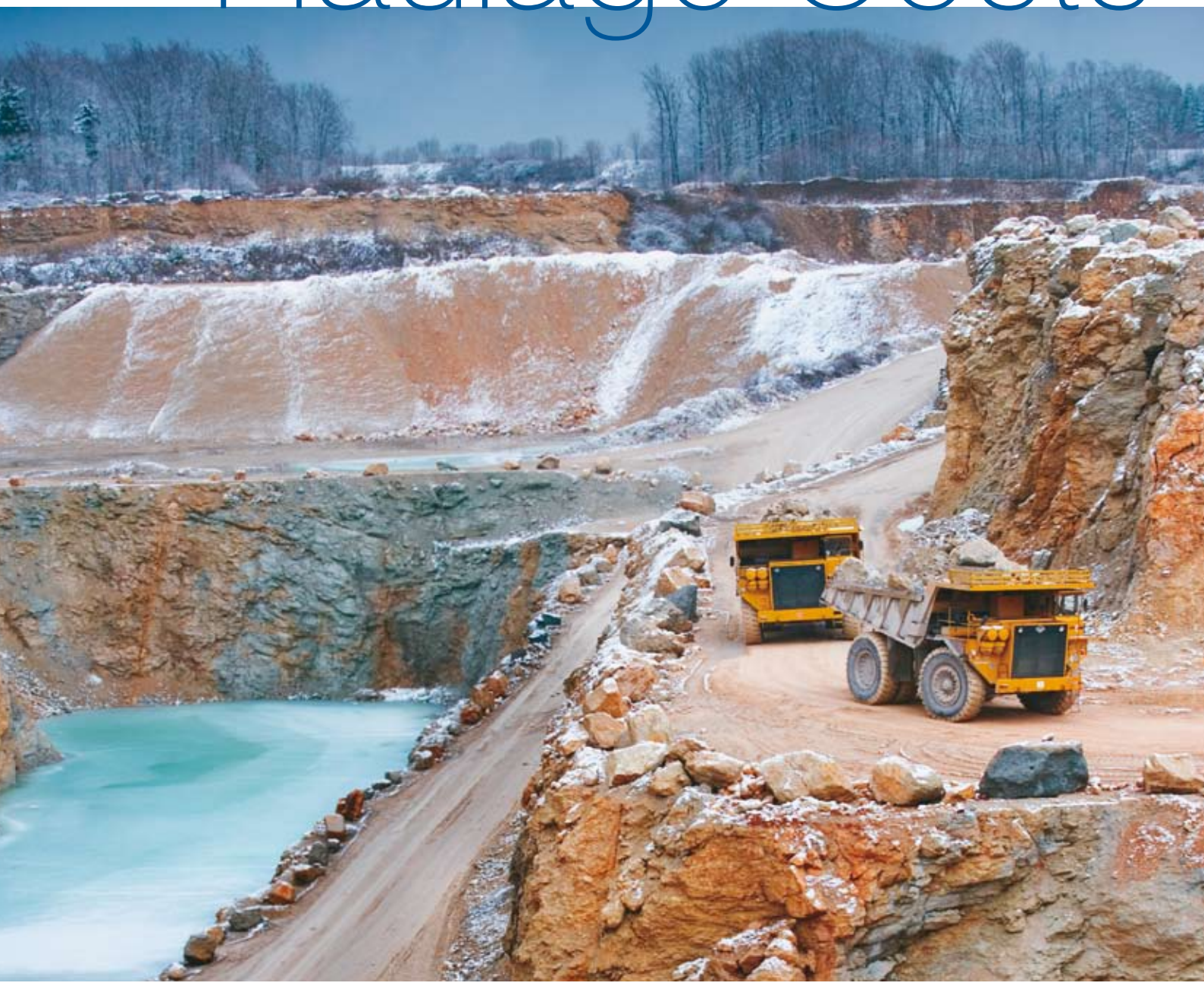
# Driving Down Haulage Costs



PROUDLY SPONSORED BY

SSAB OXELÖSUND

HARDOX® WEAR PLATE

©2007 Aspermont Limited • Courtesy of Australia's Mining Monthly magazine

SSAB OXELÖSUND HARDOX® WEAR PLATE

# Cost cutting

As production demand increases, so too does the need to keep an eye on production costs, with haulage being one of the key ones. By **Noel Dyson**

Mining is often described as more being about logistics than anything else and a key part of the logistical equation is haulage.

Driving down haulage costs is becoming harder as existing technology starts to reach its limits. There are also the upward cost pressures coming from increasing wage costs. Fuel prices are also starting to play an even bigger part in the haulage cost battle.

Then there are the ongoing problems with tyres and their availability. Part of the problem here comes from the demand to increase production, which in turn has led to mines continuing to run existing pieces of equipment as well as the new gear they had bought to replace them. This means a greater need for more rubber at a time when there is little more to be had – putting pressure on both the availability and price of tyres.

On the larger scale there are the issues of moving the product from the pit to the port. In the west the large miners BHP Billiton and Rio Tinto have an advantage because they control their rail and port facilities – a luxury they do not enjoy on the east coast where logistical bottlenecks are driving some miners to distraction.

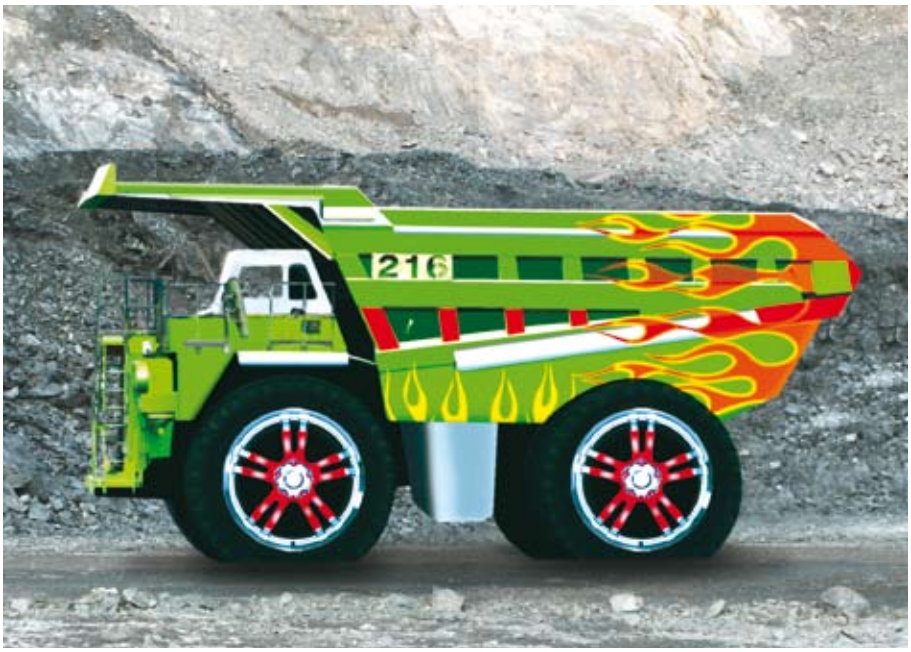
## COST CUTTING

- Training haul truck operators can have a large positive effect on haulage costs.
- Taking care of tyres is another key component to keeping haulage costs down.
- Automation is considered another way of reducing costs because it will cut down on staff numbers and also other infrastructure needed to support people on sites.
- Giving plenty of time to get parts can also help keep costs down.

## People power

Improving the skills of haul truck operators can have a major effect on the bottom line. A truism in the industry is that a 1% improvement in operator skills relates to a 1% improvement in productivity. Looking at that a different way, a 1% skill improvement means a 1% reduction in cost per tonne.

Training is the key to improving those vital operator skills. However, getting the right training can be the problem.




*While eye-catching, probably not a vehicle to help drive down haulage costs. Photo illustration Urvashi Girme*

On minesites, most haul truck operators are given a week or so with one of the "experienced" operators before getting out on track. One problem with this approach is that the training is not standardised and the trainee can end up picking up any bad habits the operator may have.

Adding to the problem is the fact that haul truck operation is often an entry-level position on a minesite and therefore does not often draw the attention it sometimes should.

As simulator company 5DT CEO Paul Olckers often says to mine managers: "You have a BMW. That's worth about $100,000. Would you let one of your haul truck drivers drive it?"

Olckers notes, "Usually the answer is 'no!' But then I point out to them, 'your haul trucks are worth $2 million.'"

Two training companies, Richards Mining Services and QFS Australia, have brought their own standardised approaches to training. Both put a greater emphasis on finding the right candidates rather than just filling positions.

QFS specialises in recruiting skilled mobile plant operators for mines, training newcomers to the industry through its Work Ready and other programs and consulting with mines to help them boost mobile plant productivity.

The Work Ready program trains specially selected candidates and then places them in mobile plant operator jobs.

QFS managing director Brett Quinn told *Australia's Mining Monthly* earlier this year that people usually landed a job on a minesite by knowing people working there.

"They then get trained by an operator and pick up that operator's good points plus any bad driving habits he may have," he said.

Under the QFS approach once people are recruited their skills are developed to a point where they have a good understanding of what is required in mining and then they are placed in a job. QFS also gives its graduates on-the-job training and mentoring – providing the company taking them takes at least two graduates.

RMS has a similar approach to recruits, in that it is very particular about who it will take on. The company runs a six-month traineeship program, which has proven successful with nickel miner and producer Minara Resources.


©2007 Aspermont Limited • Courtesy of Australia's Mining Monthly magazine

SSAB
OXELÖSUND


# In mining, the value is right under the surface

Equipment and wear parts made with HARDOX wear plate is your guarantee of outstanding resistance to impact and extreme abrasion. That translates to maximum service life, less risk of breakdowns and enhanced productivity.

HARDOX 450 and 500 have been specifically designed with the mining industry in mind, offering uniquely high impact strength. HARDOX 450 and 500 extend the service life of your equipment while offering an exceptional cost/performance ratio. They resist the wear from any kind of rock, sand and gravel and can be used as liner plates in dumpers, crushers, conveyors and chutes.

For in-depth performance advantages, make sure there's authentic HARDOX wear plate under the surface of your parts and equipment.

**SSAB Swedish Steel Pty Ltd, Office & Stocks: Perth, Brisbane, Melbourne**
**Freecall: 1300 136 566, E-mail: australia@ssabox.com**
**www.ssabox.com, www.hardox.com**

HARDOX®
WEAR PLATE

SSAB OXELÖSUND HARDOX® WEAR PLATE

Manager of group operations Graeme Richards said: "Our prerequisite is actually no mining experience. We're looking for people of good character."

The company wants people who are good workers but lack the skills to walk into a minesite job. The argument is that people who have picked up their skills on the job have not necessarily learned to perform those skills the right way.

Richards said the company had found that miners were taking on experienced operators who were bringing some bad operating habits to the job.

With the RMS traineeship the trainees spend the first four to six days at the RMS facility in the northern Perth suburb of Joondalup doing nothing but theory.

"That's just to get their heads ready for what they are about to meet onsite," Richards explained.

For the truck driving candidates, that includes running through the parts on a haul truck, how they operate, what causes those parts to break and – importantly – how much they cost to fix.

That, Richards said, made things a lot clearer as they went further through the training.

Take tyres, for example. Richards said Minara had gone from getting 6000 hours out of its tyres to 10,000 hours.

"We do a lot of problem solving exercises and looking at the mechanics of the equipment and how those parts can be protected from damage," he said.

The theory also covers areas such as site inductions and Mining and Resource Contractors Safety Training accreditation – known as MARCSTA.

> "With battery technology getting better and better we're certainly looking at what can be done with hybrid technology." – Komatsu Australia continuous improvement manager Iain Curran

"We believe MARCSTA is an important grounding for mining," Richards said.

Practical training starts once the trainees get to site.

"It takes them anywhere from three to 10 days to do a series of exercises," Richards said. "Over a five-day period they may start off spending two hours in the driver's seat and 10 hours in the passenger's seat gradually working up to 10 hours in the driver's seat and two hours in the passenger's seat by day five.

"After that they are on restricted running. They may run for 50 hours, usually in a controlled environment such as working with a loader and hauling 200 metres to a crusher."

After the first 50 hours the trainees are assessed and any bad habits they have acquired get ironed out.

By this stage the trainees have 15 days of mine life under their belt and are starting to get a feel for mine practices and demands.

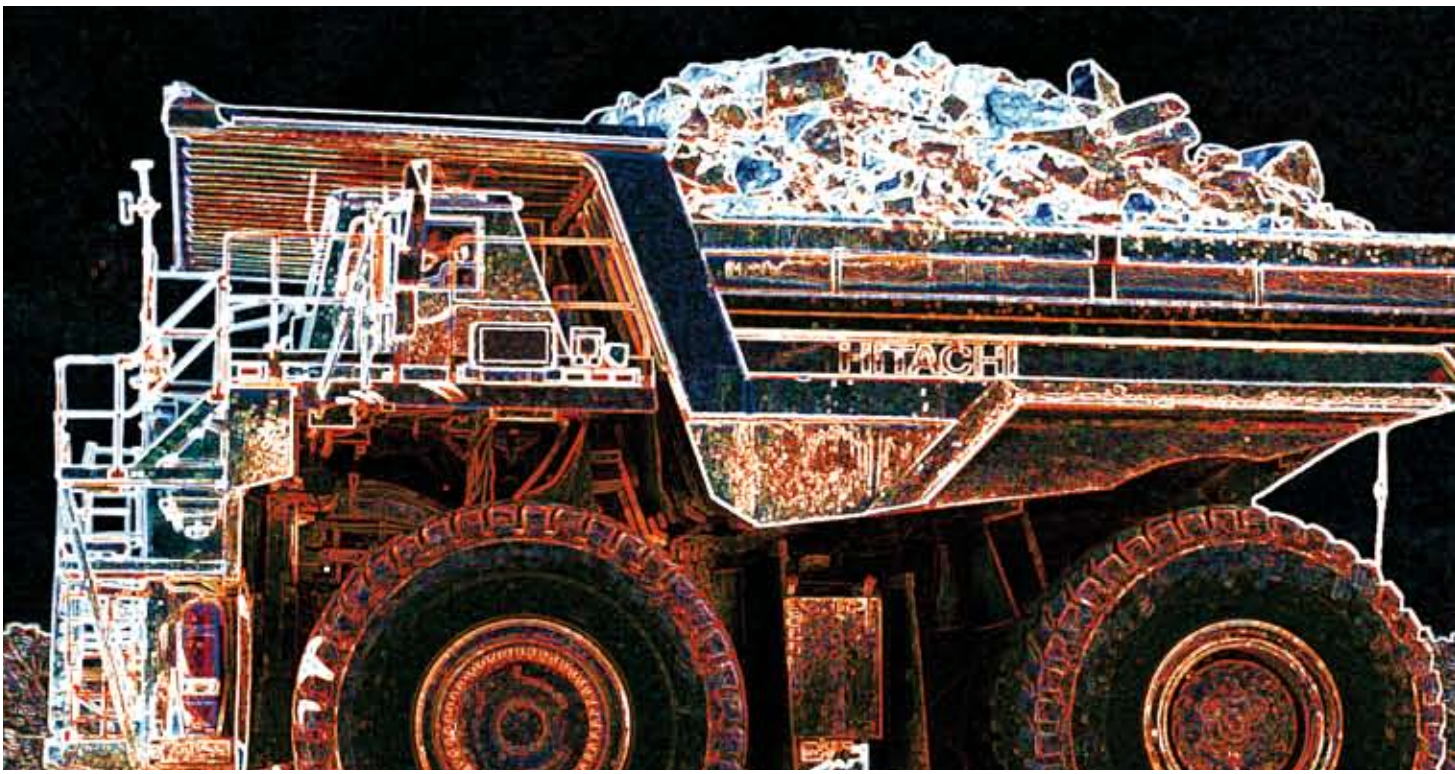
"They then go out into the mine but only on day shift in a less restricted role than they've been in before," Richards said.

"After they've completed 150 hours the trainees have a final performance assessment. By this stage they have 25 days up."

At this stage the trainees are being assessed on their skill level alone. How well are they handling the truck? Are they dumping their loads correctly?

Another way for miners to improve their workers' skills is through the use of simulators. In Australia the haul truck simulator market has been largely ruled by Immersive Technologies although South African simulator specialist 5DT has been making inroads into the market. Another entrant to the market is US-based Simlog.

Simlog has appointed RW Way Management




HITACHI MINING TELEPHONE: 61 7 3909 7900


©2007 Aspermont Limited • Courtesy of Australia's Mining Monthly magazine

SSAB OXELÖSUND HARDOX® WEAR PLATE

in South Australia as its Australian representative.

The company launched a PC-based off-highway truck simulator in April.

Simlog founder Paul Freedman said the truck simulator was an extension of its personal simulator lines.

"Our new Off-highway Truck Personal Simulator incorporates Simlog's unique focus on instruction design to provide a comprehensive yet portable training tool that knows how to teach," Freedman said.

A Simlog spokesman told *AMM* that the company's approach to simulator-based training was focused on training generics rather than machine specifics.

"We do this with an instructional emphasis for early stage training beginning with pre-screening potential new operators, controls familiarisation and taking the student through progressively more difficult trials, right up to a full haul cycle," he said.

That haul cycle includes having the student back up to a loader.

"Our intent is not to replace time in the seat of real equipment but to make students safer and more proficient when they do go into the field and consequently more productive faster," the spokesman said.

He said the simulator was developed in collaboration with Caterpillar and modelled after the CAT OHT 777 100-ton quarry truck with integrated loading in a virtual quarry environment.

While the Simlog system works with a PC, the Immersive and 5DT installations are much more substantial using hydraulics to simulate the motion of the truck over a haul road.

Immersive has more than 100 simulator units, coupled with more than 300 simulation modules for different machine configurations – including draglines, excavators, wheel loaders and bulldozers as well as haul trucks – in operation across 18 countries and has supplied groups such as BHP, Rio Tinto, Anglo American, Phelps Dodge, Newmont Mining, Xstrata and Thiess.

The company also has alliance agreements in place with five of the world's largest original equipment manufacturers, including Caterpillar and Komatsu, which gives it exclusive access to proprietary machine information.

Phelps Dodge (now owned by Freeport-McMoRan) has enjoyed the benefits of simulator training. It installed its first Immersive simulator at its Morenci mine in Arizona in 2004 and claimed it led to $US1 million a year in maintenance cost savings.

Phelps Dodge Mine Technology Group manager Jim Armbrust said: "We have made major improvements, not just in terms of eliminating some of the variance we used to see in our operators but in reducing unplanned maintenance events and being able to reinforce practices and behaviour that keep people safe and healthy and keep equipment operating optimally."

5DT recently made its move into the Australian market opening an office in Brisbane. The company was already supplying simulators to the Mining Industry Skills Centre in Queensland.

One of the keys of the 5DT system is the six-degrees of freedom electrical motion base, which the company claims is faster and quieter than three-degrees of freedom pneumatic bases. The 6-DOF base can replicate "yaw".

Olckers explained: "Yaw is what one would experience when a shovel or dragline is doing a pass, pivoting around an axis or when a haul truck drives on a slippery road."

## Tyre times

Tyres – or more accurately the finding and preservation of them – have been keeping mine managers awake for the past few years. While major tyre manufacturers such as Bridgestone and Michelin are taking steps to increase their production, the full benefits of that will not be felt for some time yet.




©2007 Aspermont Limited • Courtesy of Australia's Mining Monthly magazine

# Driving Down Haulage Costs

SSAB OXELÖSUND HARDOX® WEAR PLATE


*Proper haul road design can help protect truck tyres.*

What is interesting, from a tyre availability point of view, is the growing amount of tyre product coming out of China. Chinese rubber is becoming increasingly available in both bias ply and radial formats. However, the jury is out from the industry about these tyres. Time will tell.

For Australian miners the good news is that they are doing better than other mining countries when it comes to dealing with the global shortage of large off-the-road tyres.

However, Caterpillar Global Mining senior corporate consultant Pete Holman believes miners still need to take care of the tyres they have.

He said through proper mine design, good truck operating practices and attentive haul road maintenance, mines could get long life from truck tyres and reduce haulage costs at the same time.

Another way of looking at the tyre issue is truck availability. If a mine can keep its trucks rolling longer, that means it is producing for longer. A truck cannot haul any ore if it is in the workshop having a tyre replaced.

One of the keys to ensuring long truck life is designing haul roads properly. Corners also need to be addressed. They should have the maximum practical radius to help minimise side force on tyres. Side force generates heat in the tyres and reduces casing life. High side forces scuff the tyres and accelerate tread wear too.

This means the banking on corners needs to be addressed to negate centrifugal forces that put side loading on the truck and tyres.

Another key factor in tyre protection is ensuring trucks are carrying the correct loads. Overloading trucks puts too much stress on tyres as well as a number of other truck parts. Underloading the trucks means more hauls are need to shift the same amount of material, which is also counterproductive.

To help with the load it pays to ensure the truck is fitted with the optimum body for the material it is shifting. There is also a range of lightweight tray options such as DT Hi-Load. The aftermarket truck body allows the hauler to cart more without exceeding the rated maximum gross vehicle weight.

A number of the original equipment manufacturers also have lightweight body options for their trucks.

Of course, getting more into a truck body can be all for nought if it throws out the truck-shovel balance.

DT Hi-Load general manager John de Jager said upsetting the shovel-truck balance had not really been an issue for the company because the lightweight body usually meant the truck could take an extra shovel load.

## Optimal operations

Komatsu Australia continuous improvement manager Iain Curran said the OEM was involved with a couple of projects with Rio Tinto involving payload optimisation.

"That involves looking at payload monitoring systems in trucks and using these as an effective tool for optimising payloads," he said. "It's about not damaging the truck while carrying as much as you can." The Rio Tinto trial involves using onboard payload monitoring systems in conjunction with Modular Mining feedback. Komatsu's Payload Monitoring III system can talk in real time to the Modular Mining system.

Curran said the company was also looking at things such as trolley assist – which has not been much of an option in Australia because of the relatively high cost of electricity on most minesites here – and even at hybrid technology.

In a way it makes sense. After all, a number of haul trucks are using electric drives.

"With battery technology getting better and better we're certainly looking at what can be done with hybrid technology," Curran said. "Komatsu is researching and developing hybrid technology similar to that used in road cars – just on a much bigger scale."

On the trolley assist front, he said there were sites in South Africa that had access to cheap electricity courtesy of hydro-electric projects.

With labour costs making up an important component of haulage costs, automation is another option for miners to consider. A number of the haul truck manufacturers are looking at making greater use of automation both above and below ground.

Besides reducing staff costs automation also helps reduce the need for infrastructure such as accommodation and catering facilities and, in places where fly-in fly-out is a reality, helps reduce the mine's airfares.

Curran said Komatsu had a fleet of 320t 930E autonomous trucks working in South America.

"These have been working for a number of years with considerable success," he said. "There is a second mine about to deploy a full fleet of autonomous trucks."

Curran predicts that autonomous trucks will start to come into Australia within the next couple of years.

Cutting queues at the shovels can also help cut haulage costs. One tool that allows mine managers and controllers to do this is the Intellimine Mine Asset Management system from Modular Mining.

The system helps mine controllers optimise the use of short and long hauls across shovels and shifts. It also helps them make good operational decisions by providing the big picture perspective.

Getting parts and equipment at the best possible price is another important factor in keeping haulage costs down. Auction group Iron Planet has emerged in Australia with the aim of helping miners get their equipment at better prices.

Another way to keep parts and equipment prices down is to place orders as early as possible.

ADG Global Supply CEO Andy Greathead said his company specialised in procuring equipment for the mining sector.

While the company was capable of getting equipment the mines needed at very short notice, Greathead said that also meant a greater cost to the customer.

"The longer you give us the less it will cost," he said. "There's a significant major factor in not being organised and that's freight costs."

He said by having more time, more cost-effective freight measures could be chosen. AMM


©2007 Aspermont Limited • Courtesy of Australia's Mining Monthly magazine