Shenhua leads the way in new CHINESE COAL MINING REGION

PRODUCTION & MAINTENANCE
One team & one goal: PRODUCTIVITY

UNDERSTANDING OUR CHANGING WORLD

DISCUSSING KEY INDUSTRY TOPICS

UKRAINIAN ENERGY MINE SETS PRODUCTION RECORD IN LONGWALL MINE

NEWMONT RELIES ON REMOTE DOZING TECHNOLOGY TO KEEP OPERATORS SAFE
In this issue, we introduce “Mining for a Better World,” a new feature that allows us to recognize the sustainability programs and initiatives of companies that demonstrate what it means to mine responsibly. We hope you enjoy reading about what others are doing in this arena and encourage you to share your sustainability stories with us in the future.

Sustainability was a hot topic at MINExpo 2012, where industry leaders gathered to see the latest equipment and technologies and to discuss the topics affecting the mining industry. This issue includes an article on the state of the industry and what experts predict for the future, as well as some highlights from the Caterpillar booth — the largest in MINExpo history.

In this issue we feature three Caterpillar customers:

- Newmont Mining Corporation, which is using the Command for dozing system to remotely operate a Cat® track-type tractor in a potentially dangerous environment in Nevada, USA.
- The Shenhua Group, which is at the forefront of development in the coal-rich region of Xinjiang, China.
- DTEK, the largest private energy company in Ukraine, which recently set a production record for longwall mining at its mine in Stepnaya.

Our best practices article discusses the interrelation between maintenance and production, featuring two Caterpillar experts discussing the individual roles and how they depend on one another for success.

Finally, we take a few pages to recognize the 50th anniversary of Cat off-highway trucks. I want to personally thank the thousands of Caterpillar employees and dealers who have designed, developed, manufactured and supported them since 1963. And I want to thank our customers for their loyalty through the years.

We’re proud that Viewpoint’s readership continues to grow, and are committed to finding and reporting on topics that are interesting, relevant and inspiring to all of our audiences. If there’s a topic you’d like to see in a future issue, please let us know.

Thanks for reading!

Chris Curfman
PRESIDENT
MINING SALES & SUPPORT DIVISION
Mine sites measure productivity by the volume of material they move — and the greater that number, the greater their profitability. All facets of mining operations have an effect on this important number, from the cost of the equipment, to the efficiency of production, to the frequency of maintenance.

What some mine managers may not fully realize is the interdependence of these areas — in particular production and maintenance. When these entities work independently of one another they fail to deliver the lowest cost per unit of material moved, and ultimately the greatest profitability possible.

“Consider this sports analogy,” says Kent Clifton, a senior product/application specialist in the Caterpillar Global Mining organization. “Most teams, whether it’s rugby, football, soccer or baseball, have an offense and a defense. The offense is responsible for putting the points on the scoreboard and winning the game. But without the defense — the guys who protect the goal or the net from the opposing team and make it possible for the offense to get back in scoring position — they can’t win the game.”

“Production and maintenance can be thought of in the same way,” he continues. “Let’s call the production team the ‘offense.’ They’re the people responsible for getting the product out the door and making money for the enterprise. But we can’t forget about the defense — the maintenance team. Without their efforts in keeping equipment at peak performance, the production team can’t do its job. One can’t exist without the other — and the more we nurture that relationship, the better our operations will be, and the lower our cost per tonne.”

“The bottom line is, they’re both responsible for productivity,” says Clifton. “So even if the operations run smoothly and efficiently, without the support from maintenance, they’re not going to get costs down to what we need to have to make a profit.”

MANAGING EQUIPMENT EXPENSES

Mine sites must manage a number of expenses associated with equipment — in addition to the cost of the initial purchase — in their efforts to increase profitability.

On the maintenance side, two of the greatest areas that impact this expense are the life mines get out of components, and the necessary cost of rebuilding them. The other half of the equation is the production side — increasing the amount of material moved per hour. Factors that
affect this number include the site conditions/application in which the machines operate, and the availability of these machines as provided by the maintenance organization.

“While we look at these two sides of the equation separately, they really are dependent upon one another,” says Cameron McGovern, a Caterpillar product performance manager. “While the operations team is working hard to maximize the production they’re getting from their equipment, these activities have an effect on the maintenance required to keep the machines running. It’s a never-ending circle that we have to manage to the best of our abilities.”

For example, Clifton points out the effect of the site application on equipment. How the mine is designed, the distance between hauls, the location of service areas, the tonnage being moved in trucks or on conveyors—all have an effect on equipment. Operational conditions like improper payload management, poor operator skills and delays for activities like blasting have an impact, too.

“Every activity that impacts equipment will have an impact on the maintenance to be performed,” says Clifton. “I need to make sure I’m operating within the guidelines for equipment usage so that I’m not increasing the costs of the maintenance that will inevitably be required.”
BALANCING THE NEED FOR INCREASED PRODUCTIVITY

There’s no debating that increasing production is the goal, Clifton says. If mine managers wonder what there is to lose when they’re not operating at full equipment utilization, there’s an easy way to prove the point: Look at the value of commodities.

“Take gold, for example,” says Clifton. “There are thousands of dollars at risk every second, every hour, every tonne. Look at how long it takes you to load a truck, and multiply that by the number of trucks you have on site. Then multiply that by the number of hours a year. The potential for lost revenue gets extremely large.”

One of the ways that mine sites increase productivity is by becoming more efficient. There are a myriad of ways to do this, but three areas have been identified to have the greatest impact: Improving operator efficiency, reducing cycle times and maximizing payload. “When I efficiently and effectively manage those three areas, I can reduce my costs,” says Clifton “But there’s a risk in trying to do that if you don’t do it properly.”

McGovern explains: “If you have an operation that is not as efficient as it should be — say running around 60 percent of utilization — and you increase that to 80 or 85 percent, there are going to be costs associated with that increase,” he says.

“Your maintenance team will be busier; your costs for tires and fuel will increase. So while increasing productivity is a good thing, maintenance costs will increase. But with the increased productivity, your overall cost per tonne should be lower.”

Each change in operations — even those that improve efficiency — must be evaluated to understand the effect that change will have on maintenance resources and costs. When machines run for longer periods of
time, at higher speeds or with increased payloads, there is always a cost associated with those improvements.

**MAXIMIZING AVAILABLE HOURS**

Most mine sites set monthly production targets, and know how much material must be moved to meet those goals. The availability of equipment is the key contributor to that effort. If a site fails to reach production goals, often one of two things is responsible—either the maintenance team did not provide the necessary amount of machine availability required to meet them, or the production team did not effectively use the equipment hours provided.

By following a proactive approach to maintenance — monitoring equipment health, identifying problems early, understanding site conditions — maintenance organizations ensure not only that equipment is performing in top condition, but also that the downtime required for routine maintenance and repairs are minimized. Machines should move through the workshop efficiently, with necessary parts and personnel ready to quickly perform maintenance and repairs to get equipment back into operation.

“If the workshop looks like a parking lot, with machines lined up waiting for maintenance and repairs, then you’re not going to be able to provide high availability,” says McGovern. “A proactive approach to maintenance and planning is essential to getting those machines in and out as quickly as possible.”

While it’s critical that the maintenance crew work diligently to deliver the necessary availability, the operations team must then leverage that availability to be as productive as possible. “When the maintenance team has the iron ready, the production team needs to use it,” says Clifton. “If maintenance is providing 92 percent availability, but I’m only using those available hours for 85 percent, I’m not doing my job.”

Clifton recalls a mine site that gathered operators for a meeting during their shift. “It was supposed to be a 30-minute meeting that wasn’t tied to a regularly scheduled break or lunch,” he says. “But how long, really, is a 30-minute meeting? If you consider the time the trucks started coming in to park for the meeting, and the time when the last truck was back under the digger and actually out hauling material, it was two hours. Now consider how much gold could be hauled in just an hour. That meeting cost the mine about US$100,000.”

Clifton recognizes that meetings are important — reinforcing safety issues, discussing productivity improvements and other critical topics. “You have to have meetings, but you’ve got to be smart about it. Do your meetings at the start of a shift, or at a lunch break,” he recommends.

Utilization also is affected by the conditions in which equipment operates. In addition to the initial layout of haul roads and loading areas, sites must perform the necessary maintenance to keep these areas as efficient as possible.

“Look at cycle times,” says Clifton. “How long is it taking your shovels to fill a truck? Have you set up your loading area so trucks pull in as close to the loader as possible so they can be loaded and moved out in seconds instead of minutes? If not, at the end of the day, you could be giving up 20 or 30 truckloads of material. What about truck exchange times? Is the shovel sitting there ready to load, but there’s no truck? That’s where technology can come in — managing fleet assignments to keep machines moving efficiently.”
Technology can also help the maintenance organization understand how efficiently a piece of equipment is being used. For example, machine data can show how much time a production dozer is sitting in neutral, or how much time it’s tramping between shovels or around the pit.

“The maintenance team can look at that information and learn that about 60 percent of the time that dozer is running, it’s not contributing to production,” says McGovern. “So maybe the dozer isn’t the right piece of equipment for this particular application, or maybe the operator needs some additional training. We need to share this information with the operations team so they can address it.”

In addition to using the right machine for the job, it’s important to use that piece of equipment for maximum productivity.

“It’s going to cost money to run a truck up a hill whether it’s full or empty,” says Clifton. “The closer we get to the rated payload, the lower our cost per tonne.”

However, it’s important to understand the impact payload has not only on cost per tonne, but also on maintenance. Caterpillar uses a 10/10/20 policy—recommending that no more than 10 percent of loads are over 110 percent of target payload and never exceed 120 percent.

“If you’re under your target payload you affect productivity; if you start exceeding it, then you’re going to affect component life, tire life, and the durability of the truck,” says McGovern. “You also run the risk of exceeding certifications like steering and braking.”

**ADJUSTING INITIAL GREENFIELD GOALS**

When a new mine is being developed, modeling tools are used to recommend a loading and hauling fleet or an automated underground system, and to determine what level of production can be expected from these machines. Once a mine is up and running, sites often find that they’re not meeting the production goals they set. Clifton says it’s important to go back and adjust those expectations based on the actual site conditions.

“Say our model assumed 92 to 93 percent machine availability, a haul road with 10 percent grade, 2 percent rolling resistance for a total effective grade of 12 percent, maybe 105 percent bucket fill,” he says. “Then you finally get out to your operation and you’re starting to mine and you’re not making your targets. You have to look back at those numbers. Do I honestly have a 10 percent grade with 2 percent rolling resistance? Or do I actually have 4 percent rolling resistance and only 85 or 90 percent bucket fill? There’s going to be an impact.”

Improving haul roads is always a key to improved productivity. “Your roads can be your site’s greatest asset, or their greatest liability,” says Clifton. “Whether you’re working above ground or below, you have to make it possible for your hauling equipment to run at the speed you designed for to meet your production goals. Maintain a nice, constant grade and keep the dust down. But watch for excess water because it increases rolling resistance, which slows down the machine and is hard on tires.”

Haul roads also have an effect on machine availability, says McGovern. “If your initial mine plan predicted a flat haul, but instead it’s a 30 percent incline, your engine life is going to be affected. Monitoring and understanding the effect your application has on components is key.”
Clifton says many mines look at support equipment as an expense, but instead it is an enabler to productivity. “Say I have to spend a million and a half dollars for a wheel dozer to come in and support my operation and I just don’t want to spend the money. But you can take that money right off of your cost per tonne, because that’s what these machines are doing for you.”

Initial mine scenarios also must be reviewed on the equipment availability side. “We may start out with an aggressive target like 92 percent availability, and that’s possible,” says McGovern. “But after two or three years of operation, those machines are going to get some hours on them. You’re going to have to put them through some scheduled major and minor planned component replacements. You’re going to have machines out of production — so that 92 percent you forecast at the beginning isn’t going to be realistic once we get into the cycle. As we go through rebuilds, we’re not going to be able to deliver the hours required to meet production targets.”

**RELYING ON EYES AND EARS**

While technologies that monitor equipment performance and component life are key enablers to productivity, both Clifton and McGovern stress the importance of human interaction.

“We can’t over-emphasize the importance of simply paying attention,” says McGovern. “The operators who use that machine are our eyes and ears. They feel the vibrations, they hear the noise. From a maintenance standpoint we want to leverage every opportunity we can to get feedback so we can catch changes in equipment as quickly as possible — before they become catastrophic.”

Inspections are essential. “Look at the tires, make sure everything is properly greased, examine the GET, the headlights, the wiper,” he says. “And then report that to the maintenance organization. At the end of the day, we all want the same thing: To see equipment working as much as possible, delivering the productivity we need to be profitable.”
Located in the coal-rich Western Donbass region, the mine is part of DTEK Pavlogradugol, one of the six coal-mining companies that make up DTEK’s mining arm. Using a Cat® GH800 plow, DTEK Pavlogradugol’s team at coal field 4 was able to extract 100,500 tonnes (110,782 tons) of coal from a 1-meter (3.3-foot) seam in April 2012, at an average daily production of 3,465 tonnes (3,820 tons).

VERTICALLY INTEGRATING FOR SUCCESS

DTEK is the energy production division of System Capital Management, one of Ukraine’s leading financial and industrial groups. With 147,000 employees, it is the largest vertically integrated energy company in the country, with mining operations supporting its coal processing and energy generation operations.

The company is a key player in the Ukrainian coal industry, with 31 mines and 13 preparation plants. DTEK mines thermal and coking coal throughout the country, and accounts for around 46.1 percent of Ukraine’s total coal production. It has proven coal reserves of 1,157.3 million tonnes (1,275.7 million tons).

Some of the coal is exported, but most of it is prepared and used at DTEK’s own energy generation facilities. From there, much of the electricity is supplied to Ukraine’s largest industrial consumers. At peak production, DTEK’s power plants have a capacity of 18.2 gigawatts. Their current output is 50.1 billion kilowatt hours, sent out over 84,700 kilometers (52,630 miles) of electrical grid lines.

DTEK is able to maintain its leading position in the fuel and energy market by employing a professional management team capable of maintaining a high degree of synergy and efficiency across the board, and by introducing cutting-edge technology at all levels of operation.

TURNING TO THE EXPERTS

In connection with ongoing efforts to modernize and improve its mines, DTEK was searching for a partner to help increase efficiency in thin seams. In 2007, the company contacted a manufacturer whose team has a reputation for expertise in low-seam extraction technology.

After several site visits and discussions, DTEK purchased a GH800 plow system with 2 x 400 kW (536 hp) output power, as well as 199 roof supports, roof support controls and other technical equipment necessary for the longwall operation.

DTEK also purchased Horizon Control and Overload Protection systems to help make the face more efficient. Horizon Control is a unique guidance system that allows for fine-tuning of a plow’s direction along the face, which makes this plow ideally suited to undulating seam conditions.
In order to support the setup and service of this longwall, the manufacturer formed a local company, which continues to support operations in Ukraine today as Caterpillar Global Mining Ukraine LLC.

Caterpillar’s technical sales support staff constructed a miniature face on-site in order to train DTEK personnel before installing the equipment underground. The setup included the plow, several roof supports and a section of conveyor that enabled workers to safely learn the automation and control system as well as how to maintain the equipment.

**GETTING THE RIGHT TOOLS FOR THE JOB**

Longwall mining is the fastest, most productive method of coal extraction in terms of sheer tonnage. This is largely due to the continuous operation and heavy automation of a modern longwall face. However, it can be challenging to efficiently mine very thin seams of coal like the ones in the DTEK application.

There are two standard methods of extraction for longwall mining. The most common is the shearer, a large machine with two cutting drums that can cut even the hardest coal at an unparalleled speed. The other common method is the plow, a smaller machine that is used only in thin seams.

“When it comes to low seams, plows offer a number of advantages over the traditional shearer,” says Caterpillar’s Norbert Katthoefer, who has 37 years of experience in the longwall mining industry. “They are easier to guide, making them ideal for undulating seams, and offer more precise control of cutting depth for maximum efficiency. They are often able to achieve efficiency levels equal to, or even higher than, traditional shearsers when conditions permit.”

Finding the right equipment for the DTEK site was a challenge. “With a low seam height, weak adjacent strata and hard coal, the seam presented a unique challenge in terms of efficiency,” says Caterpillar sales representative Vladimir Semenkov. “While plows have long been seen as a viable method of extraction in seams with soft coal, most plows on the market cannot efficiently cut through harder coal.”

The GH800 plow has proven to be the right tool for DTEK. The speed with which the plow operates is key to the record-breaking production. Plows can travel at a speed of 3.6 meters per second (720 ft per minute) — significantly faster than a shearer.

“Right now, our Cat plow is one of the most efficient mining systems not only in the area, but in all of the Western Donbass region,” said mine director Nikolai Yeremin. “Our production is greater than that of shearsers in similar mines. But the most important factor is safety, because our workers do not have to be at the face during plow operation.”
One of the most important pieces in China’s energy development plan is the autonomous region Xinjiang, which is home to proven coal reserves of 91.4 billion tonnes (100.8 billion tons)—around 10 percent of China’s total coal reserve.

The area is currently under extensive development by a number of coal-mining companies, with everything from new mines to rail stations and power plants appearing all over the area in an effort to keep up with demand. The Shenhua Group, the largest coal company in the world, and its fleet of Cat® trucks are at the forefront of this development.
Shenhua operates a surface coal mine on the Zhundong coal field in Wucaiwan, Jimusaer County, a 24-kilometer (15-mile) mine site that boasts reserves of 1.5 billion tonnes (1.7 billion tons) of high-quality coal. The mine has a planned production capacity of 45 million tonnes (50 million tons) per year, as well as a power station that will be capable of producing as much as 9.34 million kilowatts. With coal seams just 60 meters (197 feet) below the surface, this coalfield is ideal for extended surface mining.

In addition to providing coal for energy, Shenhua produces large amounts of coal for use by chemical factories around China. The company recently completed a feasibility report for its 3-million-tonne (3.3-million-ton) coal-to-oil project, and is in the planning stages of implementing coal-to-natural-gas projects and other chemical conversions.

IMPROVING EFFICIENCY

The biggest challenge Shenhua faces at the Xinjiang Zhundong coal mine is improving its operating efficiency. A remote, mountainous location and harsh environment where hazards abound drive up operating costs and make it difficult to mine safely and efficiently.

Shenhua is up to the challenge, though. The company is committed to developing its surface mine into a modern, efficient large-scale mining base that will become a role model for the industry both in China and around the world.

“The coal mine in Wucaiwan is regarded as a role model in Xinjiang’s coal industry because we are the first company in the region to employ equipment and design production processes according to the standards of modern, large-scale coal mines,” mine manager Liu Peng says.
To help in this endeavor, Shenhua partnered with Caterpillar to provide reliable, efficient mining equipment that is helping the company improve its cost per tonne.

The most important aspect of Shenhua’s plan to increase efficiency is its dedication to finding the best machine for every application. This commitment led to its decision to become the first company in China to use the 218-tonne (220-ton) Cat 793D mining truck as its main haulage vehicle.

Shenhua also relies on a fleet of Cat support equipment to keep haul roads safe for its four 793D trucks. That fleet includes two 834 wheel dozers, two D10 track-type tractors, one D7G track-type tractor and two 14M motor graders.

The person responsible for repairing and maintaining those roads, as well as training and guiding more than 20 young members of the mechanical engineering team, is Meng Xiangyi. Mine staff know him as Master Meng, and he has more than 25 years of experience operating Cat equipment, including wheel dozers, wheel loaders and off-highway trucks.

“I’m very passionate about Caterpillar,” says Meng. “I have eight Cat operation certificates and have driven loaders, graders, dozers, dump trucks and many others. I can’t imagine how far I have driven Cat machines.”

BUILDING A PARTNERSHIP

To ensure that Shenhua has a ready supply of spare parts and access to the maintenance necessary to keep its equipment fleet up and running, Cat dealer China Engineers Limited (CEL) has established the largest parts supply center in northwestern China. CEL also sent a 20-person after-sales service team, led by senior engineers, to set up a parts warehouse and
maintenance shop at the Wucaiwan coal mine. This team will provide routine maintenance and around-the-clock troubleshooting for Shenhua’s Cat equipment through a Cat dealer Maintenance and Repair Contract (MARC).

The MARC team has already had success in achieving high availability rates from the machines in service, says George Granger, who serves as CEL’s MARC manager for the mine. Once the maintenance facilities are completed, Granger expects the team will be able to implement best practices and provide even higher availability.

CEL is also taking steps to support its partner’s efforts to build a pool of highly skilled workers by launching a basic knowledge training course for maintenance staff. CEL provided experienced teachers and teaching facilities to the Urumqi Coal Mine Technical School. The school is a Shenhua-funded venture that trains local workers in a wide variety of skills and topics related to work in the mining industry. Graduates are free to seek employment with Shenhua or take their talents elsewhere, providing a strong boost to local employment.

“We believe in the quality of Caterpillar, which is what gave us the courage to be the first company in China to buy 793D trucks,” says Liu. “Moreover, we rely on CEL to carry out equipment maintenance and repair. This is what forms a true partnership between our companies.”

Master Meng understands the importance of good maintenance. “Cat products are reliable and durable,” he says. “They are easy to operate, flexible and seldom break down. As long as you take care of them, they take care of you.”

1/ Representatives from Caterpillar Inc. and the Shenhua Group celebrate the delivery of Shenhua’s first four Cat® 793D mining trucks.

2/ George Granger of Cat dealer China Engineers Limited (CEL), a wholly owned subsidiary of Sime Darby Group, helps Shenhua keep equipment up and running through a Maintenance and Repair Contract.

3/ Employees of Gezhouba Xinjiang Engineering Co., Ltd, the contractor that operates the Wucaiwan mine, join executives from Caterpillar and Shenhua to celebrate the delivery of the mine’s new Cat trucks.

4/ The Urumqi Coal Mine Technical School is a place where local workers can learn the skills and techniques necessary to succeed in the mining industry.

5/ Students at the Urumqi Coal Mine Technical School have the opportunity to learn using a wide variety of resources and techniques, including Cat mining equipment simulators.
BRINGING NEW LIFE TO THE REGION

The development of the Zhundong mine isn’t just a good thing for China’s energy supply; it’s bringing new life to the region, as well.

This project has brought rapid fiscal growth to the area, providing jobs in everything from construction to mining itself. The influx of workers to the region has also created job opportunities and increased revenue in local tertiary industries, increasing the income of local residents and improving quality of life in Wucaiwan.

In 2011, Shenhua held a “Loving Care Library” donation ceremony in which the company donated 3.5 million books, worth approximately 70 million yuan (US$11 million), to 815 primary and middle schools in Xinjiang. These books benefit a million students throughout the region.

Shenhua is also heavily invested in developing additional infrastructure for the area. Along with other coal companies operating there, Shenhua was involved in the construction of a coal-dedicated railway that makes it easier for all involved parties to transport their product out of the region.

The company is also in the process of building a pithead power station near the mine that will allow it to use high-voltage lines and send electricity...
directly to both local communities and locations in central and eastern China. According to Liu, this integrated coal and electricity project will feature the shortest mine-to-power-plant distance anywhere in the country.

“No storage facilities are needed — the coal mine is the warehouse,” explains Liu. “We are also the first in the region to have built a railway transport system on which we can send coal to outside chemical factories.”

The power plant is scheduled for completion in 2013, and construction has brought outside workers and provided opportunities for local labor. This new infrastructure, and the work it takes to build it, has allowed Shenhua to help bring industrialization to the region while supporting its traditional economy.

“We are establishing a close bond between the development of the Zhundong coal power and coal chemical industries and the development of our agricultural economy,” says Zhu Falin, Jimusaer county secretary. “By doing so, we can take a new road to industrialization, pushing forward the integration of urban and rural areas.”

LOOKING AHEAD

With its significant reserves and planned capacity, the Shenhua Zhundong coal mine will be providing energy and economic growth to both Xinjiang and China as a whole for many years to come.

CEL’s Granger, who has worked in the mining industry in Australia for more than 20 years, believes Shenhua is well-positioned to succeed. “I have spent more than a year on site now, and I have seen the mine’s development taking place,” he says. “I know that Shenhua, with their professional approach and skilled management team, will be a force to be reckoned with in the industry for years to come.”

1/ Shenhua is the first company in China to purchase and operate Cat 793D trucks, which are ideally suited to the constant stress of keeping coal moving.

2/ This pithead power station is helping Shenhua remove the need for lengthy and expensive transporting and logistics procedures from the mine’s operation.

3/ The reliability of Cat 793D mining trucks is one of the reasons Shenhua considers them the best haulage choice for its Wucaiwan mine.

4/ Operators on site at the Wucaiwan coal mine show their enthusiasm about their partnership with Caterpillar.
In 1963, Caterpillar introduced its first off-highway truck, the 32-tonne (35-ton) 769. Built to handle the rigors of mining, quarries, heavy construction and industrial applications, its basic fundamentals included a mild steel frame, Caterpillar designed and built drive train and engine, hydraulic suspension and oil-cooled disc brakes.

The 769 was the first of more than a dozen off-highway truck models produced at the Caterpillar facility in Decatur, Illinois, USA, over the next 50 years. Today, the Decatur facility continues to produce Cat® trucks, from the smallest to the largest — the Cat 797 363-tonne (400-ton) mining truck. Many of the basic fundamentals that went into that first truck are part of all Cat trucks today.
Like most mining companies, Newmont Mining Corporation considers safe work performance a top priority. The company launched its Our Safety Journey program in 2009 and continues to expand it through new processes that make safety both a corporate and individual core value.

Participation in the Safety Journey is especially evident at the company’s Phoenix mine in Nevada, in the western United States. For the last two years the site has earned the Nevada Mining Association’s Safety Award for large surface mines with approximately 500 employees.

“We continually focus on safety,” says Steve Johnson, mine manager. “We know that our safety journey depends on each individual employee’s commitment to safe behaviors. So we embrace safety as one of our values and live it every day.”

Ed Hintz of Cat® dealer Cashman Equipment, a supplier to the mine, witnesses the safety culture on a regular basis as the Newmont account manager, a role he has had for 13 years. “Wherever you go, there’s a safety slogan — on the buildings, on the trucks and the loaders. At the Phoenix mine and throughout Nevada, it’s pretty impressive how much Newmont focuses on safety.”

MINING COPPER, GOLD AND SILVER

The Phoenix open pit mine, located in the high desert of Nevada, began production in 2004. Located 19 kilometers (12 miles) south of Battle Mountain, Nevada, the district has been mined on and off since the late 1800s. Newmont acquired the site in 2001 from Battle Mountain Gold.

Phoenix mines roughly 36.3 million tonnes (40 million tons) of material and processes 12.7 million tonnes (14 million tons) of ore on an annual basis. Hydraulic track shovels load a fleet of 16 Cat 793D trucks, which haul ore to the mill — one of the largest milling operations in North America.
The site performs concurrent reclamation, restoring land in tandem with mining operations and working toward a goal of completing the process as quickly as possible when mining ends. The site also has a long-term reclamation and closure plan in place. The mine has a long life expectancy, with projections out to 2050.

The mine’s fleet of Cat support equipment includes motor graders, water trucks, wheel loaders, and several track and wheel dozers which support both operations and the reclamation process. The site also leverages several capabilities in Cat MineStar™ System — Fleet for real-time machine tracking, assignment and productivity management; Terrain for grading, a machine guidance system; and Health for equipment health and asset monitoring and diagnostics.

The Phoenix mine does its own haul truck and support equipment maintenance in an on-site four-bay shop.

The site follows a rigorous Condition Monitoring process, leveraging the information from Health, and receives regular audits to meet the Caterpillar Five Star Contamination Control standards.

The site relies on Cashman Equipment for support, as well. “The group does warranty work and provides other specialized support to the department,” Johnson says, calling the dealership an important partner. “We have a strong relationship.”
LEVERAGING SAFETY TECHNOLOGIES

As its Cat equipment provider, Cashman has a hand in delivering equipment and installing new technologies that help the site meet its safety goals. One of the most recent was a retrofit to a Cat D10T track-type tractor that makes it possible for the operator to run the machine without even climbing aboard.

Command for dozing, a capability of Cat MineStar System, removes the operator from the cab of the machine and enables remote control from a line-of-sight location. The operator uses an over-the-shoulder console that allows him to work within 400 meters (437 yards) of the equipment—far enough away to be safe but near enough to monitor the equipment with his own eyes and ears.

The technology was developed to meet a number of mining challenges. By removing the operator from the cab, it also removes him or her from potentially hazardous work environments and reduces the potential for slips, trips and falls. It also minimizes operator exposure to full body vibration and exposure to dust and sand.

The basic system features a remote console from which an operator can safely perform virtually all machine functions including engine startup, acceleration, deceleration and shutdown; shifting, steering, directional control and braking; blade and ripper control; and auxiliary functions such as lights and horn. Critical information normally displayed in the cab (in gauge clusters and on display panels) is replicated on the remote console. The console weighs about 4 kilograms (8.5 pounds).

In addition to the remote console, the basic system includes a primary transceiver and antenna and a Caterpillar designed remote control Electronic Control Module (ECM). In-cab features include an emergency shutdown switch and remote control mode indicator. An on-cab beacon indicates when the machine is under remote control. A ground-level service center is also included in the basic system. It mounts on the ripper or counterweight and features two switches: one for selecting either remote or manual control, the other for emergency shutdown.

The system can be used on any Cat D10T, D11T or D11T Carrydozer. New machines are manufactured to make system installation faster and easier. Retrofit kits, the option selected by the Phoenix mine, are available for the field population.

SEEING IT IN ACTION

The Command for dozing system installed on the Cat D10T track-type tractor at Phoenix mine made its debut several years ago at another Newmont site—the Chukar mine, also part of Newmont’s Nevada Operations.

In December 2010, the mine experienced geological activity that led to the closing of a portion of the haul road to human traffic. The majority of the mining fleet was on the other side of the closed section of the road—and the instability in the road surface meant that the equipment could not be safely retrieved by personnel.

Cashman Equipment stepped in with Command for dozing—making it possible for a large track-type tractor to be guided by remote control to haul the stranded equipment back to a safe location.

Though the system was not yet commercially available, Caterpillar delivered components from various test locations and trained Cashman employees on the proper installation and use. Working with the Newmont operations team, the dozer was retrofit and the plan put into action.

Using this technology, all of Newmont’s equipment was retrieved without incident. Technology representatives and mine managers from other Newmont sites took the opportunity to see the system in action after this successful endeavor, which led to the purchase of the system for Phoenix mine.
SAFELY ADVANCING THE MINING PROCESS

In 2012, Phoenix mine installed Command for dozing on one dozer, and for one specific task—a common occurrence in mines like this one.

While its location in the high desert makes it an ideal environment for mining, the fact that the area has been mined for decades presents some challenges. There are some areas on the property where historic underground workings are present, limiting access for equipment.

“We chose the remote dozer in an effort to reduce operator exposure when they are near these underground workings,” says Travis Frakes, superintendent for surface operations at the Phoenix mine.

Phoenix mine’s use of the Command for dozing system is a common one.

“Most of the uses are in stockpiles and where there are underground stability concerns,” says Randy Schoepke, a Caterpillar mining technology expert. “There is a potential for cave-ins. And if you can take the man out of the cab, you reduce his exposure to hazardous conditions.”

Command is about safety, says Schoepke. “It’s not meant to deliver high productivity when dozing. However, it does make it possible to work in locations where you might not be able to otherwise. And because that situation can arise at any time, sites must weigh the potential costs of lost time and productivity that would cause.”

QUICKLY LEARNING A NEW TECHNOLOGY

While the remote dozer at the Phoenix mine is used just every two weeks or so, the site has trained 10 operators on the Command for dozing system—a process that takes just a few hours for experienced dozer operators.

“Anyone with a background in dozing can operate it,” says Frakes. Icons on the console are identical to those in the machine, and it is designed to be intuitive.

“The learning curve is really short,” says Hintz. “Operators run them from the console just like they were sitting in the seat. The installation is quick, too—just a few days. And the dozer can be operated as normal just by turning off the system.”

Frakes says the feedback from operators has been positive. “It’s easy to learn, especially for those who have operated dozers in the past.”

MOVING FORWARD

Newmont has been mining along a 100-mile stretch of highway in northern Nevada for nearly 50 years. Its Nevada properties boast the widest variety of processing methods of any gold mining complex in the world, which allows the company to maximize economic recovery from a wide range of ore types and grades. As mining continues in this gold-rich region, Newmont will focus on new technology in support of safe work performance, increased productivity, and a reduction in overall operating costs.

ENSURING SAFE OPERATION

A number of features are in place to ensure the safety of anyone who may come into contact with a dozer when it is being operated remotely. The system will bring the dozer to a stop when any of these conditions occurs:

• Any emergency shutdown switch is activated (in the cab, on the remote console, in the ground-level service center and on an optional redundant emergency shutdown transceiver)
• An operator falls down or trips and the remote console is tipped
• The off-board transceiver loses power
• Radio communications are lost
• Communications to the on-board transceiver or any ECM are lost
• Selected alarms are activated

Other standard safety features include an AutoRetarder function for engine overspeed protection and an AutoBrake function that engages when the machine is in neutral.
UNDERSTANDING A CHANGING WORLD

The MINExpo 2012 opening session discussion was moderated by Dr. Jeffrey Garten, the Juan Tripp Professor of International Trade, Finance and Business at the Yale University School of Management. Garten set the stage for the discussion by sharing what he believes are the top four issues that are relevant to all of the challenges that will affect the global mining industry:

• A change in geopolitics
  (the relationship among politics and geography, demography and economics)
• A change in the global economy
• Global catastrophes
• Growth in the middle class and the pursuit of a better life

Garten suggested that the world is experiencing a slowdown in the expansion of an open global economy, and—if that openness continues to slow—it will affect the world economy and global companies like those in the mining industry. “Will governments be able to cooperate sufficiently to patch up a lot of the problems that are going to emerge in a growing centrifugal political world?” he asked. “I think this change in geopolitics is going to influence the prospects and strategy of every major global company.”

Changes in the global economy itself also will affect the mining industry. “The model of the world has really been demand in the industrialized world, and supply from developing countries,” he said. “It is likely that this pattern, at least in its intensity, is no longer sustainable. And the question is, ‘Can...
there be more balance? What will it take to get that balance? And what problems lie in the transition?"

A strained global financial system also will have an impact. "It’s not clear what the global regulatory framework will be. And it’s not clear what big financial institutions will look like or how they will behave. And so the very question of where the capital is going to come from and how it’s going to be obtained, and on what terms, that’s a really big question for global companies as well."

Garten also noted how global catastrophes and the inability to plan for them will have an effect on mining. "If you look at the last decade alone you see a series of global catastrophes that have really surprised everyone—whether it was 9/11 or SARS or the Asian tsunami, Haitian earthquake, Hurricane Katrina, BP oil spill, radiation in China." Garten said this trend has grown beyond our ability to understand it, and he predicts it will continue. "For global companies this raises some very fundamental questions of how you... plan for unanticipated contingencies, how you build resilience into your operations so that you can recover from something you can’t really predict in advance."

Finally, Gartner cited the growing middle class as a key influence on mining. “Billions of people are entering the world economy. Perhaps two billion over the next 10 years will join the middle class. Everywhere there is a demand for a better life, there are aspirations for more housing, and more automobiles, more of everything."

**NAVIGATING GOVERNMENTAL REGULATIONS**

In all mining regions around the world, governments are becoming more involved in the entire mining process. Companies must navigate complex requirements that differ from region to region in order to obtain the permits and mineral rights that allow them to operate.

As part of its commitment to the mining industry, Caterpillar is focused on helping its customers meet these challenges. In fact, the company recently added a new vice president to lead this initiative. "We’re focused on how we can best work with our mining customers at the national and regional government level, work with local communities and entities, and understand their issues,” said Kathryn Karol, vice president for governmental and corporate affairs, in a show-floor interview at MINExpo.

It’s more important now than it has ever been for mining companies and their partners to devote attention to government affairs and community relations, Karol said, emphasizing that having allies in place—like Caterpillar—can help companies protect and enhance their business interests.
MINEXPO’S SIZE AND SCALE ARE A TESTAMENT TO THE INDUSTRY

BIGGER AND BETTER THAN EVER. THIS WAS THE PROMISE MADE BY THE NATIONAL MINING ASSOCIATION (NMA) FOR WHAT TO EXPECT AT MINEXPO 2012, AND THE NMA DELIVERED IN EVERY POSSIBLE WAY.

From Sept. 24-26, MINExpo 2012 brought nearly 52,000 people to the Las Vegas Convention Center—over 25 percent more attendees than the 2008 event. Nearly 2,000 exhibitors filled about 80,000 square meters (860,000 square feet) of exhibit space with every mining product and service imaginable—both up almost 45 percent from the 2008 show.

It took 12 exhibit halls at the convention center to display the latest technology, equipment, components, parts and services used in mining applications like exploration, extraction, reclamation and processing. Visitors had an opportunity to see everything from the industry’s largest equipment to small hand tools.

MINExpo also featured a 20-session education program that tackled pressing issues affecting the mining industry, with many of the industry’s top professionals leading the discussions. Participants earned professional development credits.

SURPASSING EXPECTATIONS

"MINExpo 2012 went extremely well," said Moya Phelleps, the NMA’s senior vice president of member services. "It surpassed our expectations and we’re very pleased with our exhibitors and attendees. The quality was ticked up to a new level this year."

International participation was up about 7 percent from past MINExpos, with 35 percent of attendees from countries other than the United States. "MINExpo is definitely a global show and their participation this time acknowledges the quality of the show and the opportunity for them to see so much in one place," said Phelleps.

The event is a win-win for participants and exhibitors, Phelleps explained, with attendees having access to the latest in equipment, and exhibitors getting the chance to hear first-hand from their customers.

Attendees included individuals involved in the decision-making process in regards to the purchase of equipment, Phelleps said. Visitors also included engineers and operators—those who are using the equipment every day and who can offer important feedback to exhibitors.

"It’s great voice of the customer," she said. "They can talk about what works for them, what is not working, problems they are having, and what they would like to see in future products. This drives new product development."

OPENING WITH ENERGY

MINExpo began with an official ribbon-cutting featuring Nevada Lt. Gov. Brian Krolicki and several mining company executives. Krolicki thanked those in attendance for their participation, and called the mining industry one of the bright spots in the state’s economy.

"The jobs that you all create in my state have been truly uplifting and important," Krolicki said. “As it has for its history, mining continues to work for Nevada, for this country and for the world.”

Speaker Greg Boyce, chairman and CEO of Peabody Energy Co. and chairman of the NMA, called the scale of the MINExpo event a testament to the industry.

"The world’s energy and industrial supply chain begins with mining, and the equipment and products on display at MINExpo show why mining is safer, more productive and more efficient than ever before."

(continued on page 27)
“It’s important in newer mining areas, where we have to work with governments on basic infrastructure... and when mining in active areas where you have to follow regulatory issues that might change over the course of time.”

Karol offered four simple recommendations for mining companies:

- Understand the regulatory requirements
- Make sure the quality of assets and reserves is strong enough to deliver a good return on investment
- Ensure local operations are incorporated into the company’s corporate culture
- Put stringent enterprise-wide systems in place to avoid any legal or regulatory entanglements

“We can help,” said Karol. “Caterpillar has had a global footprint for almost a century. We have networks all over the world with our dealers and partners. And we can tap into that and help our mining customers look for issues, make sure they understand requirements, make sure there are no unexpected surprises that might slow down their work, cause them to incur extra costs or miss opportunities.”

Karol also told the audience that Caterpillar is prepared to use its influence as an advocate for the mining industry. “We’re committed to educating policy-makers through our trade association memberships... advocating on key industry issues that support your business.”

SHARING A MANUFACTURER’S PERSPECTIVE

Caterpillar Chairman and CEO Doug Oberhelman welcomed visitors on the first day of MINExpo 2012 with a message about sustainability. “Sustainability is a big word,” said Oberhelman. “And it’s probably a bit overused. But it is a critical word for our industry and our mining customers because as many of you know, the way we touch the planet, the resources we extract, and the way in which we do it, draw a lot of attention. And that means we really have to focus on that.”

Oberhelman stressed that the most important aspect of sustainability for his company is safety. “It’s the safety of our people and of our mining customers as they work underground, above ground—whatever they’re doing on our machines, getting inside of our machines, servicing our machines—and we really have to focus on that. And I would tell you that the mining customers and mining industry drove us to that in a big way over the last decade.”

Mining companies also demand equipment that allows them to operate with more respect for the environment, as they face increasing governmental regulations that require them to operate more efficiently, burn less fuel, reduce emissions, and reuse and recycle materials. Caterpillar is focused on...
The ribbon-cutting ceremony was followed by an opening session and panel discussion that attracted more than 1,200 people. “That really set the tone for the show,” said Phelleps. “It was amazing to me, that level of energy.”

During the session, executives from several leading mining companies discussed how mining is the beginning link in the global supply chain — providing the metals, minerals and energy needed to sustain economic growth and security around the world.

The discussion was moderated by Dr. Jeffrey Garten, the Juan Tripp Professor of International Trade, Finance and Business at the Yale University School of Management. The panel included Boyce; Red Conger, president of Freeport-McMoRan Americas; and Richard O’Brien, CEO of Newmont Mining Corp.

Garten painted a picture of mining’s future as one filled with “enormous uncertainties, enormous perils and enormous opportunities.” The industry is facing dozens of issues, including resource nationalization, corporate consolidation, lower quality mineral deposits, and environmental responsibility.

In spite of the challenges, mining executives expressed confidence in the global demand for more minerals, metals and coals for those areas experiencing rapid urbanization and a growing middle class, like India and China. Challenges such as a shortage in skilled labor and an uncertain financial system will definitely impact their operations, but they believe the outlook for mining is, and will remain, positive.

Executives also expressed confidence that they can continue to improve their environmental and safety performance, as well as work hand-in-hand with those in the communities where they operate, and with the government-owned mining operations prevalent in many of the growth markets.

**BREAKING RECORDS**

Again this year, the largest and most comprehensive exhibit at MINExpo was presented by Caterpillar. It was the single largest exhibit in the history of the show at about 4,830 square meters (52,000 square feet) and showcased 28 pieces of iron weighting a total of about 2,360 tonnes (2,600 tons).

“The Cat® exhibit was incredible,” said Phelleps. “We have worked with Caterpillar on a number of shows, and we work well together. And every time it gets better. This time it was fabulous.”

The record-breaking display included Cat products for both surface and underground mining and materials handling, including several products introduced for the first time. The exhibit also shared the story of the end-to-end services and solutions available to the mining industry—from Cat dealer support and equipment management services to generator sets and even a locomotive.

The Caterpillar theme, “Wherever there’s mining, we’re there,” was selected to illustrate the company’s commitment to the mining industry. Welcoming visitors to the booth, Caterpillar Chairman and Chief Executive Officer Doug Oberhelman remarked, “There is no bigger stage to give us this remarkable opportunity to tell the Caterpillar mining story.”

With its 2011 acquisition of Bucyrus, the company now offers more equipment for mining than any other manufacturer. “Our customers had asked for a global partner to meet their needs with a broad product line and you’re seeing that right here,” said Steve Wunning, a Caterpillar group president with responsibility for resource industries, during an address to attendees. “From surface to underground— even a locomotive—that’s what it’s all about.”

“We have a huge commitment to mining,” he continued. “First of all it’s an outstanding industry. It’s incredibly important to the world. Just think what mining does in our everyday lives. Without mining where would we be?”

**EQUIPMENT AND SERVICES**

The Caterpillar MINExpo exhibit was divided into two areas — surface and underground. In addition to dozens of products and technologies,
meeting this need, while at the same time ensuring these improvements don’t reduce the profitability of mining operations.

“I can assure you that everything we’re doing — around our trucks, around our technologies, around our motors, our drills, you name it, everything — is to make sure that our customers achieve the lowest owning and operating costs. If we do this right, we preserve our resources, it’s sustainable and we all win. And I think that’s a big message this year from Caterpillar.”

Rebuilding and remanufacturing also are key focus areas for Caterpillar. The company has a large remanufacturing business around the world, rebuilding and remanufacturing components — from transmissions to engines — and rebuilding complete machines. Pointing to the locomotive in the Caterpillar display, Oberhelman said, “That locomotive over there — and the cars behind it hauling coal — we can recycle the entire thing. We can rebuild box cars and flat cars. We preserve a lot of the axles for trucks, and all the components. We rebuild them and put them out the other side of the facility like new. And it’s very important. It’s important to us, it’s important to our planet, and important to our customers.”

Being good citizens in the communities where they operate is another key area of focus for mining companies. Manufacturing companies like Caterpillar recognize its importance and make it a priority internally as well as externally. “I’m always proud to say this of Caterpillar people — they’ll work for free for sustainability, for recycling programs, to help communities,” said Oberhelman. “We’re very focused on water and making sure more of the planet has drinkable water. It’s the right thing to do, and I get a lot of positive feedback from customers and our own employees when we do something like that.”

LOOKING AHEAD

While the mining industry faces a host of challenges, the overall message of MINExpo 2012 was one of optimism.

“Despite all the uncertainties, in my view it’s a very good bet that we are living in an era of enormous opportunity and that for the industries that you represent there are some unprecedented possibilities to expand and to profit,” said Gartner. “But there are going to be a lot of surprises along the way. There are going to be a lot of walls put up — some of them very suddenly. And so it’s going to be a very bumpy ride.”

1 / Caterpillar employees are committed to working on projects that protect the environment, like sustainability programs designed to ensure people all over the world have access to clean drinking water.

2 / When recycling a locomotive, like this one on the show floor at MINExpo, Electro-Motive Diesel (owned by Caterpillar through its wholly owned subsidiary Progress Rail Services Corporation) will re-use 80 percent of the steel components. In addition, Progress Rail reconditions, reshapes and resells rail infrastructure, railcars and locomotive components.
(continued from page 27) the exhibit showcased the complete Cat offerings for the mining industry.

The surface area featured products for hauling, material handling and extraction — mechanical and electric drive trucks, a wheel loader, track-type tractor, track and rotary drills, a hydraulic shovel, a dipper from an electric rope shovel, a dragline scale model, and a shovel/dragline cab.

The underground area showcased equipment for hard rock, longwall and room & pillar applications, including a longwall shearer, roof supports, a longwall plow system, shield hauler, two continuous miners, and a hard rock underground truck and loader.

Technology areas included the Cat MineStar System Walkway on the above-ground side of the exhibit, and an underground operations center on the below-ground side. A product-support area focused on equipment management, highlighting Cat dealer services like Condition Monitoring, and displayed a Cat vocational truck equipped as a dealer service truck.

Wunning stressed that while Caterpillar had the largest display of equipment at the show, the company offers more than iron. “We try to be a one-stop shop,” he told visitors. “You see the products, but it’s much more than that. It’s our solutions. It’s our services. We work with our customers to help identify and solve their problems. When our customers win, we win — and that includes our dealers.”

SUPPORT

In its 2012 display, more than ever before, Caterpillar showcased its global distribution and support network, which the company claims as a key differentiator in the mining equipment market.

“I was talking to one of our key clients last week, and he said, ‘When we look at dealers we don’t see a separate company. We see Caterpillar,’” recalled Stu Levenick, a Caterpillar group president responsible for customer and dealer support. “Our theme, ‘Wherever there’s mining, we’re there,’ — the ‘we’ part, that means dealers as well. The single biggest advantage we have is the Cat dealer organization.”

Chris Curfman, president of the Caterpillar Global Mining organization’s sales and support division, has high praise for the dealer network. “Cat dealers support your needs in the field, anywhere in the world, in any conditions that you can imagine,” he said. “They’re the best in the business.”

An important aspect of that support is superior parts distribution. “We know that the single biggest driver of customer loyalty, after they buy a Cat machine, is getting parts when they need them,” said Levenick. “And so building out our parts distribution network further as the world expands and we move into emerging markets is a critical objective for us and it’s something we’re very serious about.”

UNIQUE DISPLAYS

At the center of the Caterpillar exhibit was Cat Center Stage — a large media wall that broadcast both live and recorded segments throughout the day. Product launch announcements were made twice each day, introducing machines such as the new CM235 continuous miner. Many segments featured show-floor interviews with Caterpillar experts on a variety of topics including technology, products, financing, power, rail, safety and sustainability. Caterpillar executives were on hand for live interviews covering Caterpillar corporate messages and positions on issues affecting the mining industry.

Caterpillar also offered several hands-on, interactive experiences. Highlighting its partnership with Immersive Technologies, the company displayed a PRO3 simulator that allowed visitors to operate Cat AD45/SSB underground articulated trucks in a virtual environment.

Touchpoint: the Caterpillar Global Mining Experience, a 6-meter-long (20-foot-long) display unit with three 165-centimeter (65-inch) interactive touch screens, was located in two areas on the Caterpillar show floor. This interactive display allowed visitors to explore the breadth of the Cat product line for mining by interacting with surface and underground equipment in 3D environments. Touchpoint also featured stories, videos and photos highlighting mining best practices, safety and sustainability.

One screen in each Touchpoint featured an Augmented Reality experience that let visitors a mining shovel in the palm of their hand in a 3D virtual tour. Also new for Caterpillar this year was the MINExpo mobile app, which could be used before, during and after the show to learn about the exhibit, review product information, and watch videos and interviews from the show floor.

MOVING FORWARD

Planning for MINExpo begins years in advance. Attendees and exhibitors were surveyed to gather feedback that will guide the NMA in the future, and Phelleps has been meeting with a number of vendors, including Caterpillar, to discuss the survey results and suggest ways to improve MINExpo 2016.

“Because MINExpo only happens every four years, it has become the event that everybody really wants to come to,” Phelleps said. “It’s being recognized for that.”
Kinross Gold Corporation provided funding for enough food to make one million meal packs for the University of Guelph’s Fight Against Hunger program. These food packs are part of an emergency food drive for the country of Mauritania, where Kinross operates its Tasiast mine.

“There is an immediate and critical humanitarian need in Mauritania, and we’re excited to be a part of this Fight Against Hunger event,” said Ed Opitz, vice president of corporate responsibility for Kinross.

The drive began with a kickoff event in September 2012, where approximately 1,500 volunteers, including Kinross employees, packed 200,000 emergency relief meal packs. These meals were sent to the drought-stricken Sahel region of Mauritania, where they helped combat a severe food crisis.

Kinross has supported a number of social and community initiatives in Mauritania, including providing the government with US$10 million to assist in building the country’s first mining school, as well as a US$2.5 million donation to assist in building the country’s first mining school, as well as a US$2.5 million donation to help build and equip a new Medical Emergency Centre.

Arch Coal received the National Museum of Forest Service History’s 2012 Conservation Legacy Award in September 2012.

“The museum board salutes Arch Coal for passing on a conservation legacy through its outstanding efforts to restore landscapes, safeguard wildlife and enhance the public lands where the company operates,” said museum president Gray Reynolds. “The men and women of Arch Coal have set a stellar example for public-private cooperation with the U.S. Forest Service and demonstrated an unwavering commitment to serving as long-term custodians of our nation’s forests and grasslands.”

Deck Slone, Arch’s senior vice president of strategy and public policy, accepted the award at a ceremony during MINExpo 2012.

NEWMONT MINING MAKES A DIFFERENCE IN YOUNG PEOPLE’S LIVES

Newmont Mining Corporation partnered with Junior Achievement in Denver, Colorado, USA, to help teach inner-city youth about financial responsibility and the advantages of education. In addition to providing financial support to the organization, Newmont staff serve as volunteers and advisors at a number of Junior Achievement events throughout the school year.

At the “Finance Park,” Newmont volunteers spent two days helping approximately 250 students from Denver’s metro area learn about budgeting and financial responsibility. Using a computer simulation, students learned about the expenses that are deducted from a paycheck and how to budget what is left.

Newmont volunteers also helped with the Stock Market Challenge, where high school students learn how to make and monitor financial investment decisions.

Chris Howson, Newmont’s vice president and controller, led Newmont’s involvement with the program this year.

“What it drives home for them is the reality that a better-paying job will make their lives better,” said Howson. “And the road to get there is education. The other important thing they realize is that it is attainable for them if they work hard and stay in school.”

In June 2012, Vale broke ground on a historic emissions reduction project at its smelting facility in Sudbury, Ontario. The Clean Atmospheric Emissions Reduction (Clean AER) project is an investment of US$2 billion.

This project will see sulfur dioxide levels at the smelter reduced by 70 percent, as well as a 35 to 40 percent reduction in dust and metals emissions. It is scheduled for completion by the end of 2015, and will put Vale well below the government-regulated emissions limits for 2015.

Project Director Dave Stefanuto called the project the beginning of an exciting and demanding period for Vale. “This project is massive, and will utilize the latest technological innovations available to us to retrofit our smelter complex,” he said.

John Pollesel, CEO of Vale Canada Limited, said, “This is a historic day for Vale and demonstrates the importance that Greater Sudbury plays in our global operations. Starting today, we are building a lasting legacy for our employees, the community and future generations who will live and work in Sudbury. And that is truly a reason to celebrate.”

Following recent floods in Queensland, Australia, BHP Billiton donated US$1.04 million to the Red Cross Queensland Flood Appeal. This money, which will be used to fund Red Cross relief efforts in communities affected by the floods, was donated through the BHP Billiton Sustainable Communities fund to match an equal contribution from Queensland’s government.

Marius Kloppers, CEO of BHP Billiton, said, “BHP Billiton has a long and proud history in Queensland, and we are committed to supporting communities where we operate. We hope these funds will make a positive contribution to the state’s recovery program.”

BHP Billiton has more than 13,000 employees and contractors in Queensland, with major metallurgical coal, silver, lead, zinc and iron mines in the region, as well as an office in the city of Brisbane.

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Leighton Contractors’ new headquarters in Queensland, Australia, is the first building ever to receive the state’s 6-Star Green Star rating for “office interiors” from the Green Building Council of Australia.

Leighton’s headquarters has now received a 6 Green Star Trifecta by earning three 6 Green Star awards in the same building: one for Office Design, one for As Built rating, and one for Office Interiors.

According to Hugh Boyd, general manager of northern construction for Leighton Contractors, this building is symbolic of Leighton Contractors’ values as a whole.

“The Green Star ratings demonstrate our commitment to our values, and to setting the pace for the industry in environmentally sustainable design,” said Boyd.

According to Boyd, the company’s hope for the headquarters was to reach new levels of environmental performance using economically efficient means, and to use this building as a precedent for future efforts.

Freeport-McMoRan Copper & Gold recently partnered with Caterpillar, Cat® dealer Empire Machinery and the Caterpillar Tinaja Hills Demonstration and Learning Center on a project called MineZone, designed to educate the next generation on the importance of mining.

MineZone is a six-week program of interactive sessions supported by hands-on activities. Students throughout Arizona, USA, learned about geology, mining methods, equipment, safety and environmental stewardship.

Over 300 students got the MineZone experience. Once a week, they gathered in a classroom where they were able to ask an expert questions — watching a live broadcast on TV and using the chat function on their computers. After the 15-minute live Question & Answer session, students did a hands-on activity that often involved a snack — like cake ore samples or cookie mining.

Jeff Fitch, manager of the Caterpillar Tinaja Hills demo area, starred in the session on mining equipment. Bob Horne and Steve Brady from Empire Machinery covered mine safety.

The mining message went beyond the classroom. The program ended with a family day at the Arizona Science Center — extending this education to students’ families. Empire Machinery provided a wheel loader and Caterpillar Global Mining donated special flashlights for the event.

Xstrata Partners with Origin Energy in Clean Energy Projects

In April 2012, Xstrata Copper announced a new partnership with Origin Energy, the leading integrated energy company in Australia.

Origin has acquired a 51 percent stake in Xstrata’s Energia Austral hydroelectric development company in Chile, and is in the early stages of a detailed project feasibility study. This study is an expected investment of US$75 million, and will determine whether Energia Austral’s hydroelectric projects move into the construction phase.

The three prospective hydroelectric plants—Cuervo, Blanco and Condor—will have a capacity of approximately 1,000 MW. These plants were designed according to Xstrata’s industry-leading standards in sustainable development, and at full capacity will avoid the generation of 3 million tonnes (3.3 million tons) of carbon dioxide emissions per year compared to fossil fuel electricity generation methods.

The plants will be located in an area with reliable access to both rainfall and flowing water, ideal for hydroelectric power generation. They will also provide jobs for around 4,000 local laborers and bring new life and development to the region. The study is expected to result in a final decision to proceed with construction in 2015 or 2016.

Two mining companies named in Top 50 Best Corporate Citizens

Two major U.S. mining companies, Freeport McMoRan Copper & Gold, Inc., and Newmont Mining Corporation, were named to Corporate Responsibility Magazine’s list of the 100 Best Corporate Citizens.

This list uses publicly available data to compile scores in a variety of areas pertaining to corporate responsibility. Each of these scores is weighted and combined to rank companies based on their level of responsibility.

These categories are: Environmental, Climate Change, Human Rights, Employee Relations, Corporate Governance, Philanthropy and Financial. These categories cover all potential aspects of corporate responsibility, and are weighted to reflect their overall importance in determining just how responsible the corporation in question is.

Out of 1,000 leading U.S. companies surveyed, Freeport ranked 10th and Newmont ranked 42nd.
A pink, 115-tonne (127-ton) longwall shearer has been unveiled at a coal mining project in central Queensland, Australia, to mark the start of a new friendship between Rio Tinto, Caterpillar Inc. and the McGrath Foundation, which raises money to place breast care nurses in communities across Australia and to increase breast cancer awareness in young women.

Caterpillar supplied the shearer as part of the longwall for Rio Tinto’s Kestrel mine extension project. The organizations have teamed up to fund a new nurse who will serve the Mackay and Hinterland region, providing support to families experiencing breast cancer to ensure their physical, psychological and basic support needs are met. Thanks to the funding from Rio Tinto and Caterpillar, the service will be completely free, with families experiencing breast cancer able to self-refer.

The new McGrath Breast Care Nurse position will further strengthen central Queensland’s breast care nurse network. “Our mission is to ensure every family experiencing breast cancer in Australia has access to a breast care nurse no matter where they live or their financial situation,” said McGrath Foundation ambassador and director Tracy Bevan. “We believe we need 150 McGrath Breast Care Nurses across Australia to meet this need, and friendships like ours with Rio Tinto and Caterpillar are helping us take one step closer to this goal.”

Caterpillar Asia Pacific underground coal manager Hugh Paul said Caterpillar is proud to be a partner in this initiative. “At Caterpillar we pride ourselves on support, both for our customers and for the communities in which we live and work,” he said. “Caterpillar saw this as an opportunity to partner with two world-class organizations and provide a much needed aftercare resource to support those in central Queensland affected by this disease.”

John Coughlan, Kestrel mine general manager of operations, echoed Paul’s sentiments. “Rio Tinto Coal Australia is a long term member of the central Queensland community and is proud to help fund the McGrath Breast Care Nurse position through the Kestrel mine extension project,” he said.
CATDEALERSACQUIRE
RIGHTS TO SELL AND SERVICE EXPANDED CAT MINING EQUIPMENT
As a continuing part of Caterpillar’s plan to transfer sales and support of all equipment to the Cat dealer network, several dealerships have now acquired portions of the Bucyrus distribution network. Barloworld Limited, Cashman Equipment, Cavpower, Ferreyros, Finning International, Hastings Deering, Hewitt Equipment Limited, Sotreq, Toromont Industries Ltd., Vostochnaya Technica, Wagner Equipment Co., Walker Machinery, WesTrac, and Whayne Supply have all purchased the portions of the Bucyrus distribution network in their territories. In addition to the rights to sell new machines from the expanded product lines, these dealers have begun providing parts, service and support for equipment already in the field. Additional dealers may be in the process of acquiring or have already acquired their own portions of this network since the time of this publication.

PRODUCTION BEGINS AT NEW HYDRAULIC EXCAVATOR FACILITY IN VICTORIA, TEXAS
In order to meet increasing worldwide demand, Caterpillar has completed construction on a new 102 000-square-meter (1.1-million-square-foot) facility for production of hydraulic excavators. The new facility is currently producing excavators, and is ramping up production by adding new models each month. Caterpillar has already hired about 225 local workers to staff the plant, and intends to add more as demand increases. When operating at full capacity, this plant will more than triple Caterpillar’s current production rate, and free up other facilities to make other machines and better fit regional demand.

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HYDRAULIC EXCAVATOR STARS IN JAMES BOND FILM
A Cat 320D L played a pivotal role in the opening scene of the latest James Bond movie, Skyfall. In order to make the scene work, Caterpillar built a 320D L with the cab on the left side specifically for the movie. Cat dealers Finning UK and Borusan Makina also helped with the shoot by providing parts, generator sets and on-the-ground support for the excavator. Cat products have appeared in more than 20 movies, dating as far back as 1927; and previously appeared in the Bond series as part of The World is Not Enough in 1999.

FIRST CAT BRANDED HIGHWALL MINER DELIVERED
Omega Highwall Mining, LLC of Richlands, Virginia, received the world’s first Cat branded HW300 Highwall Mining System. Fresh off the line from Caterpillar’s Integrated Manufacturing Operations Division facility in Beckley, West Virginia, this machine is helping Omega mine the valuable Jawbone metallurgical seam. Historically, adverse roof conditions have made it difficult to mine this seam successfully using traditional underground methods. However, a highwall miner is operated entirely from the surface, with only the cutting and conveyor equipment actually going underground. This allows for safe, productive mining even in tough areas.

FOR MCATERPILLAR
TO DEVELOP NATURAL GAS TECHNOLOGY FOR OFF-ROAD EQUIPMENT
Caterpillar announced its intention to partner with Westport Innovations, a global leader in natural gas engines based out of Vancouver, British Columbia, to develop technology to fuel off-road equipment with natural gas rather than diesel fuel. This project aims to develop engines that run on the cheaper, more environmentally friendly natural gas without sacrificing the power and performance customers have come to expect from Cat off-road equipment. In addition, these two companies hope to develop ways to retrofit existing machines with this new technology. They expect to adapt the engines for Cat 793, 795 and 797 mining trucks, as well as locomotives produced by Electro-Motive Diesel, a subsidiary of Caterpillar’s Progress Rail company. Commercial production of these engines is expected to begin sometime in 2017.

CATERPILLAR ANNOUNCES OPENING OF TWO NEW FACILITIES IN CHINA
In January 2013, Caterpillar announced the opening of two new facilities in Tongzhou, Jiangsu Province, People’s Republic of China: a new manufacturing facility for large wheel loaders and a state-of-the-art proving ground. Located at the mouth of the Yangtze River, the Tongzhou facilities provide a significant boost to Caterpillar’s logistic and manufacturing capabilities in China and the developing Asia Pacific market. These two facilities recently worked together to create the Cat® 986 Wheel Loader: the first machine designed, validated and built in China specifically for China and other global markets.

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CATERPILLAR NAMED TO 2012-2013 DOW JONES SUSTAINABILITY INDEXES
For the 12th consecutive year, Caterpillar has been named to the Dow Jones Sustainability Indexes. Using a thorough process of economic, environmental and social performance analysis, the DJSI selects and acknowledges companies that have made significant commitment and progress to sustainable development. “We are laser focused on our customers,” said Caterpillar Chairman and CEO Doug Oberhelman. “And our customers are focused on sustainability.” From creating new technologies to improving their own manufacturing processes, Caterpillar is at the forefront of sustainable development in the industry.

EXPANDING MANUFACTURING CAPACITY IN INDONESIA
In an effort to improve support of mining customers in the Asia Pacific market, Caterpillar is in the process of expanding its manufacturing capabilities in Indonesia. To this end, the company is constructing a new facility in Batam, Indonesia, where it will build a range of mining truck chassis and bodies to be shipped throughout the region. This facility is expected to begin production in the third quarter of 2013. In addition to the new facility, Caterpillar is in the process of tripling excavator production at its plant in Celeungsii, West Java.

For more news, visit mining.cat.com

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