

MINING & CONSTRUCTION

MECHANIZED ROCK EXCAVATION WITH ATLAS COPCO – NO 2 / 2010



A helping hand in the quarries of Vietnam

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on the Kola
Peninsula

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are coming to
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rigs launched in
Australia

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Atlas Copco

EDITORIAL



Every cloud has a silver lining, as the old saying goes, and the recent economic downturn is no exception. For example, at the same time as our customers have to deal with reduced volumes, fiercer competition, and budgetary restraints, many have also taken the opportunity to step up the search for more effective ways of doing things.

At Atlas Copco we think that's a silver lining that will be turned into gold as the economy improves.

Our philosophy has always been to focus on the big picture; to provide solutions rather than equipment, to encourage our customers to talk about investments rather than costs, and to emphasize the value of long-term partnerships rather than relationships based on uptime-per-hour.

Over the years, this approach has helped our customers to achieve impressive results. But we are not resting on our laurels. We aim to intensify our efforts even more.

That's why we have now launched global certification for all of our service engineers – a mandatory, multi-national, professional training programme aimed at securing a uniform standard of service competence reaching all around the world.

It means that the service engineers who may be assigned to your worksite, wherever it may be, as well as those who you meet periodically from our many Customer Centers, will all have the same high level of competence for servicing and maintaining your equipment. As you can read on page 21, a certified Atlas Copco engineer will become your guarantee of quality.

ANNA KÄLLMAN
Technical Training Manager
Atlas Copco, Underground Rock Excavation Division

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MINING & CONSTRUCTION is published by Atlas Copco. The magazine focuses on the company's know-how, products and methods used for drilling, boring, rock reinforcement and loading worldwide.

PUBLISHED BY Atlas Copco Rock Drills AB, SE-701 91 Örebro, Sweden. www.atlascopco.com
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SE-121 25 Stockholm, Sweden.

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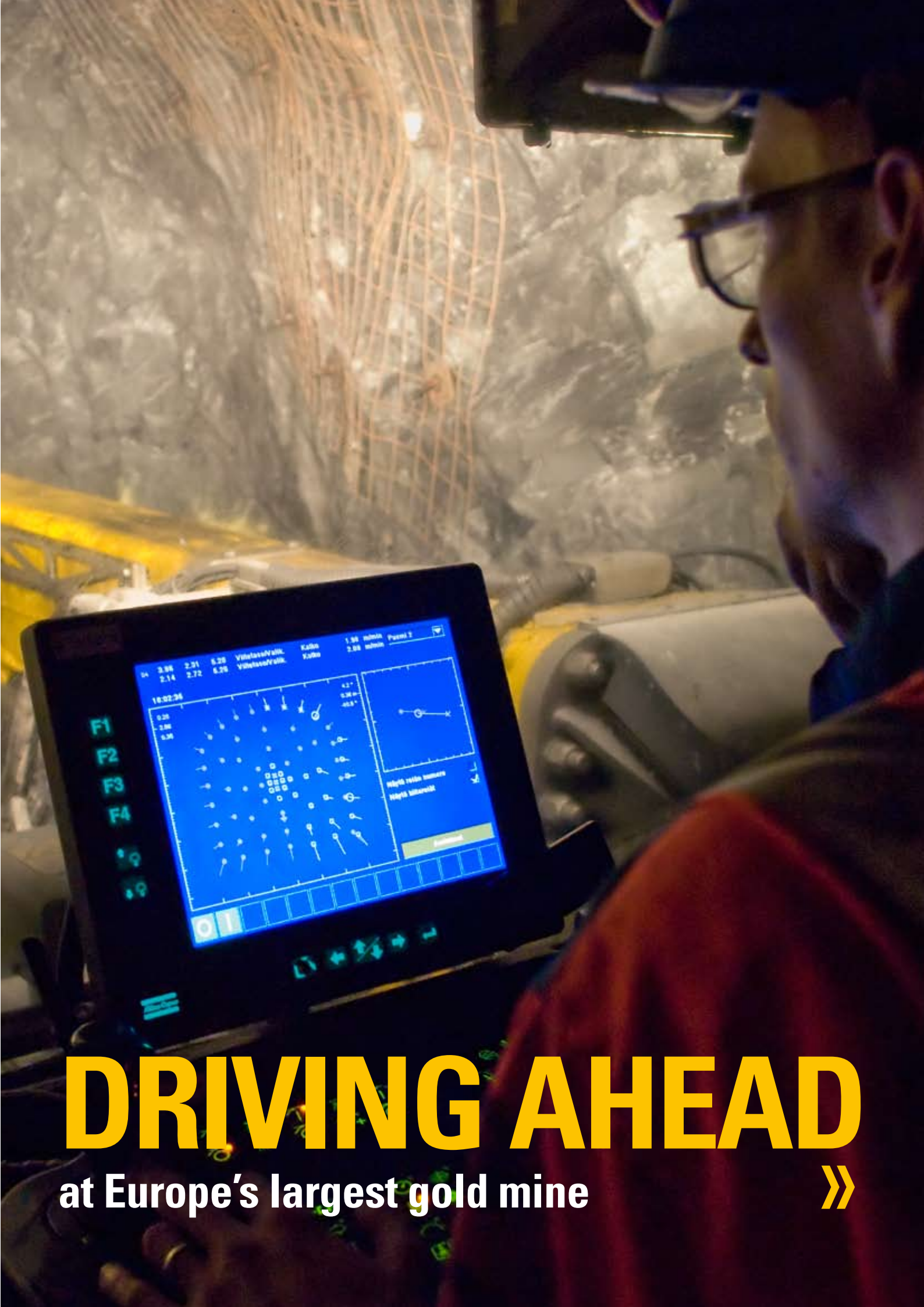
PRINTED BY Alloffset AB, Bandhagen, Sweden 2010.
ISSN 0284-8201.

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DRIVING AHEAD

at Europe's largest gold mine



Fast installation: Two Atlas Copco Boltec LC rock bolting rigs are used to install 2.4 m Swellex rock bolts. In addition, reinforced shotcrete and wire mesh are used and safety inspections are carried out daily.



» ***Agnico-Eagle is a Canadian-based gold producer with mines and exploration properties in Canada, Finland, Mexico and the USA. At its Kittilä Mine in northern Finland the company is forging ahead with plans to switch from open pit mining to an underground operation.***

Kittilä lies in the far north of Finnish Lapland, 150 km within the Arctic Circle, where the summer sun never sets. It wasn't the sun that attracted Agnico-Eagle to the region, but the gold locked in an ore body hosted in what is called the Suurikuusikko Trend.

Open pit mining of the Suuri pit began in 2008 and Kittilä poured its first gold in January 2009 with commercial production following four months later. The 3 000 tonne-per-day operation is expected to average 150 000 ounces of gold per year for at least 13 years.

Underground expansion

Driving the development of the underground mine at Kittilä are two Atlas Copco Boomer E2 C drill rigs that feature the latest BUT 45 square profile booms.

Timo Rissanen, Underground Mine Captain, explains the drilling pattern: "Currently we are driving ramps and creating space for underground infrastructure such as service areas at the 350 level. The normal face drilling pattern uses 73, 48 mm holes plus three 102 mm reamed holes. The area of the face is around

27.4 m² into which holes of 5.2 m are drilled producing a pull of around 4.5 m."

Boomer operator Juha-Matti Pulli is an experienced driller that has used Boomer rigs on projects in Sweden. He says that the Boomer E2 C rigs are performing well but singles out the new booms as the best feature when comparing this rig to the ones he has operated before.

"We are drilling here up to ninety



Timo Rissanen, Underground Mine Captain, Agnico-Eagle: "We are currently driving ramps and creating space for the underground infrastructure."

degrees to the right of the rig, though we can go to a hundred and thirty five degrees. The square profile of the booms makes them much more stable than the round ones – there is minimum flexing when drilling and moving – they are much more rigid." Pulli also praises the controls saying that the display panel and joysticks are easy to use and well placed.

Rapid reinforcement

The mine's rock reinforcement programme currently consists of bolting and meshing and/or reinforced shotcrete. Two Atlas Copco Boltec LC bolting rigs are used for drilling and installing the 2.4 m Swellex bolts, using 35 mm Secoroc bits. "We have a total support policy with daily inspections," explains Alexandre Proulx, Superintendent, Agnico-Eagle. "We in-





Developing the underground drifts: One of the mine's Boomer E2C face drilling rigs featuring BUT 45 booms. The rigidity and stability of these square profile booms enables fast positioning, quick collaring and parallel holes contributing to the impressive pull of 4.5 m per round.

stall eighteen bolts per round and it takes only around thirty seconds to drill each hole. The Swellex bolts are also quick to install so it takes less than two hours to achieve support in the drift.”

Capable of drilling, installing and inflating the Swellex bolts, the Boltec installs the bolts in a 1.4 m x 1.4 m pattern before wire mesh or reinforced shotcrete is applied.

As the Swellex bolt is inflated within the constraints of the hole's profile, support is instantaneous. The water pump on the rig stops automatically when the correct pressure (300 bar) is achieved, signalling to the operator that the bolt is properly installed and working.

With development of the underground mine well under way, Agnico-

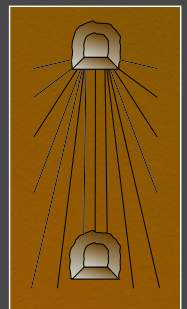
Eagle is preparing to switch production from open pit mining to sublevel stoping and has already selected a drill rig to handle the underground production. The Atlas Copco Simba M6 C is due to arrive in September. Mechanized transverse open stoping with delayed back-fill will be used to mine the underground portion of the orebody.

The Simba will drill downhole fans of 25 m or 40 m, depending on the shape of the orebody, completing the mine's immediate need for production drilling equipment.

“We selected the Simba because we found that it was easy to set up,” says Alexandre Proulx. “We also liked the fact that it is similar to the Boltec and Boomer rigs, and so it will be easier for

UNDERGROUND PRODUCTION DRILLING

When the Simba M6 C drill rig arrives at Kittilä in September this year its task will be to drill downhole fans of 25 or 40 m, depending on the shape of the orebody. Right, the basic drill pattern as planned showing a total of 15 drill holes per fan.



the operators and maintenance employees to familiarize themselves with it. There is also the fact that the rigs have many components in common.”





Setting the benchmark for DTH drilling: Pentti Nousiainen (left), Drilling and Blasting Supervisor, Agnico-Eagle, inspects the new Secoroc COP 54 Gold Express hammer with Oula Näkkäläjärvi, ROC L8 operator and Heikki Räsänen, Product Manager, Atlas Copco Rock Drilling Tools.

» For its surface production, Kittilä mine used top hammer drill rigs until June 2009 when the mine took over drilling operations from a contractor. Tophammer drill rigs were used for production work, but did not manage to reach the desired levels of productivity.

Looking for an increase in the productivity of the blast hole drilling, the company tested an Atlas Copco ROC L8 surface crawler. The rig is equipped with a Secoroc COP 54 Gold Express 5 inch DTH hammer and is drilling 7.5 m benches in the orebody. The hammer is especially designed for production drilling, is service-free and offers consistent performance throughout its life.

A Finnish first

This was the first DTH rig to be used for open pit mining in Finland, a country that has a tradition of using tophammer rigs for surface mining. It quickly became

evident that the rig's performance, in terms of overall productivity and hole quality, was a major step forward. This led to an order for a second ROC L8 rig which was delivered to Kittilä in October that year.

"We used to have problems with the blasting because of the hole quality," says Jukka Brusila, Mine Planning Engineer, Agnico-Eagle. "The old rigs produced uneven benches and that took time to fix. There are no deviations with the ROC L8 holes, and the benches are much cleaner."

Feeding the concentrator

Pentti Nousiainen, Drilling and Blasting Supervisor, Agnico-Eagle, is responsible for the production of the day shift in the open pit mine. "I need to produce 3 000 tonnes a day from this pit for the concentrator," he says. "The ROC L8 rigs help me to achieve that goal. The holes are clean, straight and drilled to the correct depth which is essen-



Jukka Brusila, Mine Planning Engineer: "There are no deviations with the ROC L8 holes and the benches are much cleaner."

tial for producing good fragmentation and neat benches.

"Using the old rigs we could have as many as thirty to forty holes per hundred

“ In terms of performance, the rigs saved our production.

Alexandre Proulx, Mine Superintendent, Agnico-Eagle.



Feeding the concentrator: One of the mine's two ROC L8 surface crawlers equipped with 30 bar compressors, at work on the bench. The rigs drill 7.5 m holes in ore and 15 m in waste to produce 3 000 tonnes of ore per day.

with problems including under drilling or collapses. I would say we are now looking at two in a hundred, and those two are usually caused by a truck driving over the hole.”

The Secoroc bits used on the ROC L8 rigs achieve around 70 to 80 drilled metres before regrinding on a Secoroc GrindMatic grinder. As the bits are reground around 20 times, they are usually only disposed of when the body wears, rather than the buttons.

Maintenance-free hammer

The COP 54 Gold Express is also proving robust. “We get more than 15 000 metres of service life per hammer with one ‘e-kit’ rebuild that replaces the consumable parts of the hammer,” adds Nousiainen.

The 140 mm Secoroc flat face bits feature spherical buttons and perform the vast majority of the drilling. Through especially loose overburden however, 165 mm Secoroc bits are occasionally used.

Juhani Rantatalo, who operates one of the ROC L8 rigs, has been drilling at Kittilä for two years now, and has witnessed the change over from tophammer to DTH drilling. “I like the service-free hammer and the fact that the holes are very straight,” he says.

In terms of productivity, Rantatalo says that during a 12-hour shift, with 9-10 hours of drilling, he achieves around 250 drilled metres. “I also like the fact that you can add water to the flushing air,” he adds. “This helps to cement and stabilize the hole, especially in the overburden.”

In addition to the ROC L8 rigs, Kittilä has a ROC F9 C with foldable boom and powerful tophammer – capable of drilling 30 m holes with 89-127 mm bits – used for the pre-split drilling, and an Atlas Copco HB 4200 hydraulic breaker.

Summing up the performance of the ROC L8s, Mine Superintendent Alexandre



Juhani Rantatalo, Operator, ROC L8: “The holes [produced by the ROC L8 and Secoroc DTH hammer] are very straight.”

Proulx says: “I think there are things we can still improve on, such as service capacity, but in terms of performance the rigs saved our production.”

CEMENTING THE

Surface drilling supports Vietnam's fast growing economy

Vietnam's rapidly expanding economy is deeply linked to the growth of its infrastructure. Roads, bridges and housing all depend on cement. However, most of the limestone, and therefore the cement industry, is concentrated to the north... but the south is rapidly catching up.



The perfect choice: In the structured rock at Ha Tien's Binh Phuoc limestone quarry, the Secoroc COP 44 Gold DTH hammer gives the best performance in combination with Atlas Copco's surface drill rigs ROC F6 and ROC D7 (right).

There is virtually no limit to the high quality limestone that can be obtained in North Vietnam and is used by the north's cement plants to supply the country's construction needs.

In the south, however, limestone quarries are scarce and there are only three cement companies in operation – an imbalance that is now being rectified.

One of the southern cement producers is Ha Tien 1 Cement Joint Stock Company which operates a new quarry and cement plant in Binh Phuoc Province. The business is beginning to thrive and Atlas Copco has played a central role in the development work.

Nguyen Quoc Thang is Vice Director of Operations for Ha Tien's Binh Phuoc facility. He says he appreciates all the suggestions and recommendations made by Atlas Copco as the operation has developed, as well as the surface drill rigs that have been acquired along the way, consisting of modern ROC crawlers and Secoroc rock drilling tools.

“We are very satisfied with the equipment,” Vice Director Thang told M&C during a recent visit. “It gives us no problems and the open communication with Atlas Copco has been very helpful.”

Customer care

Atlas Copco's local Sales Manager, Nguyen Anh Tuan, emphasizes close attention to the customer's needs. “My primary task is to support the customers as much as possible here in Vietnam and we believe that growth will happen – for them and us – when the customer is taken care of.”

In addition to supplying the drilling equipment which includes two ROC F6 down-the-hole rigs and one ROC D7 top hammer rig, Atlas Copco also works with Ha Tien to determine the best consumables for the rock conditions at the site.

For example, it has been decided that the Secoroc COP44 Gold DTH hammer works best in this quarry due to its durability in the varying structure of the rock.

Diverse geology

The geology is quite diverse offering three distinct chemical balances of limestone

“We especially appreciate all the suggestions and recommendations that we received along the way.”



Nguyen Quoc Thang Vice Director of Operations, Binh Phuoc facility, Ha Tien.

FUTURE





Cement on the rise in South Vietnam: From left, Mai Thanh Son, Deputy Site Manager; Thai Son, Deputy Mine Manager; Nguyen Tien Toan, Site Manager and Nguyen Anh Tuan, Atlas Copco Sales Manager.

» which is evident in the colour of the rock. The black stone has more magnesium, red has more iron oxide and yellow has aluminum oxide. The formations are also bound with clay which absorbs the explosive force causing poor rock fragmentation.

The ROC F6 drills 130 mm holes whereas the ROC D7 drills 102 mm holes. The holes are drilled on a 3 x 4 m pattern to depths of 10 m.

The large amount of boulders was the reason for acquiring the ROC D7 top hammer rig. It has a folding boom system which makes it ideal for secondary blasting but it is also used for production drilling.

The Bihn Phuoc quarry covers 320 hectares. The company produces some 10 000 tonnes of rock per day and has a projected production life of five years. It also has other sites available for development.

According to Vice Director Thang, the cement plant has a production rate of 5 500 tonnes of clinker per day.

The young quarry is quickly getting its production processes to settle down and is increasing its capacity. With help from Atlas Copco, a maintenance schedule and an ongoing operator training programme, the operation is on track to achieve its aim – strong growth in a growing market. ☉



Tackling the boulders: The ROC D7's folding boom system makes it ideal for secondary blasting as well as production drilling.

Cluster drills the future for LARGE HOLE DRILLING



Cluster drills fitted with an assembly of DTH hammers are widely used in the USA for fast and easy drilling of large diameter holes. Above right, lowering a cluster unit into place and, at left, emptying the Calyx cuttings can.

By Leif Larsson

Large hole drilling using cluster drill technology is commonplace in North America, Australia and the Far East. Now the technology is poised for success in Europe.

Many construction projects have been developed in recent years with a view to improving Europe's infrastructure, but for one reason or another these projects have not materialized.

Complex approval procedures, planning routines and public tendering systems as well as the negative effects of the financial crisis have all played a part in this delay.

However, we can now see that many of

these infrastructure projects are under way and more will follow which is great news for Europe's many contracting firms eagerly waiting in the wings.

It is also great news that these companies will now have access to a technology that will help them supply these projects with large diameter holes – faster, easier and more economically than ever before.

The secret is cluster drills, tailor made assemblies specially designed and developed with down-the-hole hammers from Atlas Copco Secoroc, which operate as one big, powerful DTH unit capable of drilling holes for a wide variety of different applications.

The US experience

Cluster drills have been used with great success in the US in locations with harder formations where the conventional auger drill, alone or in combination with cable

tools, does not give sufficient productivity, often causing severe delays in the project.

The same goes for Europe where most of the land with good conditions for foundations has been consumed and many new projects will be constructed in more difficult areas which have not been exploited before due to poor soil and unstable rock.

Cluster drills can be used for a wide variety of applications such as poles, piles, pylons, foundations, rock sockets, bridge piers, footings, caissons and shafts.

This is the ideal situation for cluster drills. They are easy to transport, simple to use, easy to service and, best of all, extremely fast. In most cases, cluster drills drill holes up to 50–300 percent faster than any other drilling equipment such as auger drills which cannot be used in rock.

For the individual contracting company, all these benefits provide a competitive



HOW CLUSTER DRILLS WORK

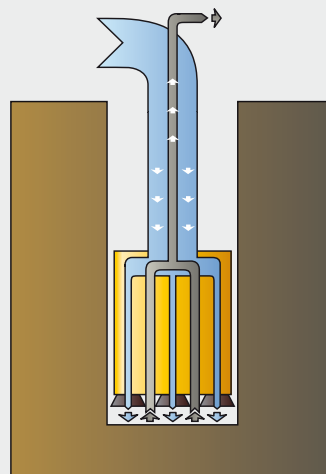
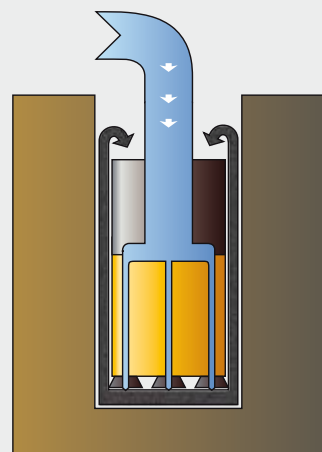
Atlas Copco Secoroc has been providing large hole percussive drilling solutions for more than 20 years. Large hole sizes range from 311 mm to 3 048 mm.

These Cluster drills are designed and engineered in Roanoke, Virginia, USA. They are modular and tailor-made in a wide variety of configurations, depending on the application, and are supplied with quick-change, self-index bits for easy bit removal and rapid bit service. The drills are also capable of reverse circulation drilling and can operate under water or mud.

The assembly is normally mounted on an auger drill for holes of up to 1.2 m. The DTH rock drills in the "cluster" are driven independently but work together as a single unit as soon as the assembly comes into contact with the ground. Power is provided by a rotation unit.

There are two methods of extracting the cuttings – either via the space between the drill assembly and the outer drum (Fig. A) or through strategically placed reverse circulation holes at the bottom of the drill head (Fig. B). The cuttings can also be collected in the overhead drum, known as a Calyx basket.

Cluster drills are very suitable in soft to hard competent rock and may also be used in medium fractured rock. Using a conventional auger drill, a 1.2 m diameter hole, 4 m deep, drilled in soft rock, takes approximately 300 minutes to drill. Using a cluster drill, the job can be completed in 100 minutes – less than half the time.



advantage, especially bearing in mind that the one thing that all construction projects suffer from is delays. And as all contractors know, there are penalties for those who do not get their jobs done on time and there are bonuses for those who do.

With a cluster drill from Atlas Copco, a foundation company that has been contracted to supply large diameter hole solutions will be confident not only of meeting the project deadline but most likely of finishing the job well ahead of time.

There are 23 models of cluster drills to choose from covering a hole diameter range of 711–3 048 mm. Equipped with the Secoroc RC50 hammer and a Calyx basket a cluster drill can drill to a depth of 25 m.

Cluster drills weigh between 2.5 and 8.2 tonnes. No extra feed force is required. A cluster drill requires only enough feed

force to close the bits completely in the hammers and to couple the bits firmly to the rock. The rule of thumb for weight on bit is 2 270 kg per bit in the cluster drill.


The required compressed air pressure and air volumes normally required is 10 bar and the air consumption is 15 m³/min per hammer.

A typical set up time from arrival to site until the start of drilling is 1–2 hours and the typical penetration rate is 3–6 m/hr.

Local support

Atlas Copco supplies the complete package: the right DTH rock drills in the right diameter range and configuration in addition to standard Atlas Copco portable compressors needed to supply the compressed air. A 1 m hole (40") will require 1 400 l/s at 10 bar whereas a 2 m hole (80") will require 5 000 l/s at 10 bar.

As more and more contractors adopt cluster drilling, they will of course need technical support and to meet that demand we are now in the process of building up our competence in Europe to support cluster drill customers outside of the US.

In the meantime, contractors who want to know more about this technology and what we can offer are welcome to contact their local Atlas Copco Customer Centre. 



Leif Larsson, Product Line Manager, DTH products, at Atlas Copco Secoroc is a leading member of the team behind the development of cluster drill technology.



DEEP!



until the year 2032, after which production will gradually decrease.

The entire project has been preceded by several years of highly advanced and extensive studies using some of the most sophisticated methods of testing, calculation and analysis in the industry.

From the results obtained it is clear that the project will depend heavily on the performance of the Atlas Copco drilling equipment at the site. There are two fleets

involved, the first owned and operated by Kovdorsky GOK, the other by mining contractor Technobur. These include large-hole rotary drill rigs, down-the-hole crawlers and rock drilling tools from Secoroc.

It is also clear that extraordinarily careful drilling and blasting in order to maintain maximum stability of the 12–15 m high benches, is, and will continue to be, the key to success.

The studies resulted in a set of param-

eters for the engineering geologists and a 3D model of the deposit which was used to forecast areas where slopes might fail. Five different geological zones were selected for testing and for each one, the bench slope angles, heights and the required width of safety berms were defined.

This information led to a list of specifications for the excavation of the “new” pit including extra-careful blasting techniques involving pre-splitting, relief of




Drilling the big ones: Atlas Copco rotary rigs are used to drill large diameter production holes to depths of 14–20 m on the 12–15 m high benches.

A major player in Kovdovsky's Super Deep Mining programme: Atlas Copco's DM45 HP rig on the pit's upper, 12 m high benches.

The rotary rigs use Russian tricone bits while the down-the-hole rigs use Atlas Copco Secoroc COP 64 hammers and 165 mm and 200 mm bits for production drilling.

The high pressure rigs, DML HP and DM 45 HP are used for either DTH or rotary drilling, depending on the rock conditions. Perevozchikov explains that Technobur services these rigs with the assistance of Atlas Copco service engineers.

The project is progressing according to plan and Kovdorsky expects to reach its first stage targets by early next year. 

Footnote: The Kola Peninsula covers an area of approx. 100 000 square kilometres and is known for its rich variety of ores and minerals. But it is also known as the home of the world's deepest hole – the Kola Superdeep Borehole.

The hole is the result of a scientific project started in 1970 to drill as deep as possible into the Earth's crust. A number of holes were drilled, the deepest of which reached 12.3 km in 1989.

ATLAS COPCO DRILL RIGS AT THE ZHELEZNY PIT

Technobur

- 3 DML LP 1600 and 1200 (rotary)
- 1 Pit Viper 275 LP (rotary)
- 1 DML HP (DTH and rotary)
- 2 DM 45HP (DTH and rotary)

Kovdorsky

- 2 ROC L8 (DTH)



starts to grow

Norilsk joins two mines to boost underground productivity

Leading Russian mining group, MMC Norilsk Nickel, is currently developing what could become one of the largest underground metal mines in the world. To meet its targets, it relies on first class drilling equipment and modern maintenance services.

The recent expansion and growth of Russia's Norilsk Nickel is impressive. It is today an international mining group with major undertakings in Russia as well as in five other countries.

The company is also extremely diverse. Not only is it the world's largest producer of nickel and palladium but also a substantial producer of platinum, cobalt, copper and rhodium, as well as by-product metals including gold, silver, iridium, osmium, selenium, ruthenium and tellurium.

The Russian arm of the group is run by two production divisions located 2 000 km apart; the Polar Division operating in the Krasnoyarsky region around the city of Norilsk, and the Kola Division operating around the city of Zapolyarny on the Kola Peninsula, about 165 km west-north-west of Murmansk and about 80 km east of Kirkenes in Norway.

As the only open pit in the region will close this year, the company is increasing its underground production of nickel with a major development programme integrating two underground orebodies into one – the Severny-Gluboky mine.

Modern fleet underground

At first sight, the surface infrastructure and mine buildings, primarily designed to withstand the Arctic climate, show little sign of new investment. Inside, however, and especially underground, it is clear that substantial modernization is under way.

Kolskaya GMK is the company implementing the programme with Deputy Director Gabo Perisaev in charge of the operations. "We started with the aim to integrate the Gluboky mine with the larger Severny mine in three phases," he explains. "We worked with specialized contractors and have been relying on Atlas Copco to supply and service a large part of the equipment fleet."

The "new" Severny-Gluboky mine employs 1 600 people who work a three-shift day, 24 hours a day. In 2008, the mine produced 3.5 million tonnes run-of-mine ore. In 2009, when the expansion kicked in, production reached 4.7Mt, exceeding the planned target of 4.6 Mt. The target for 2010 is 6.3 Mt rising to 7.0 Mt in 2011.

First phase of unification

The first phase of the unification project got under way in 2004 with the driving of a 3.5 km underground roadway linking the two mines.

At this stage, Kolskaya GMK also started sinking a shaft to the -320 m level at Gluboky for winding two balanced 25–26 tonne skips, also fed from an underground crusher. During Phase Two, which started in 2006, the mine developed its ore transport infrastructure, enabling hoisting to start in March 2008, ahead of the official opening of Severny-Gluboky in May 2008.

Two Atlas Copco MT1020 minetrucks were supplied in 2005, hauling an average of

about 23 000 m³ per month. In Phase Three, the deep mining area has been extended from the -320 m level to the -440 m level in order to increase capacity to 6.0 Mt/y. This work is scheduled for completion during 2010 but may be slower depending on market demand.

Advantage Simba

When looking for a suitable drill rig fleet, Kolskaya considered a large number of alternatives before choosing the Atlas Copco Simba.

According to Gabo Perisaev, the engineers particularly liked the rig's precision control and the high degree of safety that it provides in the event of a roof fall. In addition, they were convinced that the service support, available only from Atlas Copco, would be a significant advantage to the project. This included the setting up of a parts warehouse at the mine, linked with Atlas Copco facilities elsewhere in Russia.

The first Simba used at the mine was the 252 model, but the fleet now mainly consists of Simba L6 C rigs which are used for most of the production drilling as well as Simba M7 C rigs. Drift development is carried out with Atlas Copco Boomer rigs, creating drifts for production drilling, trucking and transverse drifts for loading.

Two mining methods

Kolskaya currently has two mining methods in operation – longhole stoping in the



Rigorous process: The Atlas Copco training programme is designed in three stages to provide service technicians with a full range of skills from simple routine maintenance to deep product knowledge and supervisory skills with full certification after a four to five year period.

The importance of service

New initiative to set global standard

The best-trained service technicians in the industry. That's the goal of a new worldwide training initiative. To achieve this ambition, Atlas Copco has implemented a comprehensive training programme aimed at establishing an international standard.

Achieving and maintaining maximum productivity in the mining and construction industry requires more than just cutting-edge technology. With this in mind, Atlas Copco's new, worldwide training and certification programme, launched this year, aims to increase customer satisfaction and productivity.

The programme consists of three levels of certification and combines e-learning, classroom sessions, on-the-job training and evaluation. "The objective of this global training programme is to ensure that all of our service technicians can offer the same high level of service, wherever in the world they operate," says John Carnall, Vice President, Parts & Services, Atlas Copco.

"The programme will increase the value of our service offering. At the same time it will ensure that the equipment our customers have invested in to achieve their business goals is operating to its maximum potential."

Increased flexibility


The move to introduce a uniform standard of skills and knowledge across Atlas Copco's global network of service technicians also means that the service organization will be able to respond more flexibly.

"Having certified technicians worldwide means that we can send people from one country to another, safe in the knowledge that they have the same set of skills," adds Carnall.

The certification programme has already been launched. By the end of this year, all of the company's currently serving technicians will have achieved the first of three levels of certification.

Creating a worldwide standard for service technicians is just one part of Atlas Copco's drive to standardize its range of products and services with corresponding benefits for customers.

For example, many of the company's drill rigs now share common parts, control systems and functionality. This commonality speeds up the training of operators and familiarization of rig maintenance programmes while streamlining spare parts inventories.

"As the training programme advances, our customers will benefit from benchmarked service, and technicians that can better appreciate our customers' business needs, as well as their maintenance requirements," concludes Carnall. 



Making an impact: Billed as “The Beast,” Atlas Copco’s new ROC D65 SmartRig promises to deliver new levels of availability, maintainability and performance, as well as safety in surface drilling.

The beast and the viper show their high-tech teeth IN AUSTRALIA

More than 100 representatives of 60 mining and contracting companies in Australia attended the recent launch of the new generation SmartRig ROC D65 (profiled as The Beast), and its large-hole cousin the new Pit Viper 235 series. These rigs – and the technology they represent – take surface drilling to a new level.

The first SmartRig series for DTH drilling and the first Pit Viper 235 for rotary drilling have made their debut down under – and that makes Australia the first country outside of Europe and North America to get the benefit of these Atlas Copco RCS-based innovations.

At this action-packed launch on May 20 these rigs highlighted not only the advantages of satellite and mine plan-linked navigation as well as automated feed alignment, rod handling and rig set-up, but also fuel saving and maintenance innovations.

These features and more are shared by both rigs, but also by Atlas Copco’s underground and exploration equipment.

“It’s a commitment that we’ve made to standardize our support capabilities and our operating platform, not just for our surface drilling range but also our underground products,” commented Peter Barnett, Business Line Manager, Atlas Copco. “The common technology platform and numerous standard parts produce training and operating benefits; it means familiarity with a machine can be transferred across a range.”

Impressive automation

Barnett described a visit to Boliden’s Aitik copper mine in northern Sweden during extensive testing of the SmartRig ROC D65

as ‘an eye-opener’. “The auto-rod adding with the system racking its own rods while the operator was standing next to me was seriously impressive,” he said.

Dustin Penn, Product Line Manager for blast-hole drills, said the Pit Viper series of large blast-hole drill rigs (for holes up to 400 mm/16 inch diameter) had been very well received since the introduction of the PV-351 at MINExpo in Las Vegas a decade ago. Ongoing development culminated in the Pit Viper 235 launched at MINExpo in 2008.

“When we started out on this project a few years ago the intention was to replace our very successful DML product and we had several targets in mind with the Pit Viper,”



Cutting edge control: Visitors to the open-pit demonstration saw first hand the advanced capabilities of the new ROC D65 SmartRig.



Major attraction: The latest Pit Viper 235 for the hole diameter range 6-0" features the RCS control system and is available in several engine and compressor alternatives for either rotary or high pressure DTH drilling.

he added. "They were simply to maximize productivity and minimize non-drilling time while maximizing fuel efficiency and improving the maintainability of the machine.

"These drills transport and set up faster, they are capable of true single-pass production drilling and they are the safest and easiest-to-maintain machines in their class.

"There are several other technologies that we've developed ranging from the cable pull-back system that has replaced the previous chain pullback, which has improved safety and helped to capture our faster feed speeds, to the new break-out auxiliary wrench for rod joint breaks."

"Air compressors consume thirty percent of their rated power in standby mode, so when the operator switches the air compressor off it is still turning and using horsepower," Penn continued. "So what we're doing with this clutch is physically disconnecting the air compressor from the engine and saving quite a bit of horsepower when you're changing rods, tramming, levelling, or idling. You save some of that horsepower and we've seen up to fifteen percent in fuel consumption reductions."

Spotlight on training

Atlas Copco's new generation drill rigs will still be controlled, for the most part,

by operators so the company's latest training initiatives were also put under the spotlight. These include the Master Driller multi-tier global training programme and advanced simulator training using an Atlas Copco designed and certified rig module and software. Both are due to be introduced in Australia in September this year.

Positive reaction

The reaction from the attendees was positive. John Ivanovski, Project Manager, Drilling, of Rock Australia, said the company had just bought its first SmartRig ROC D65 and had high hopes for its performance at a nickel mine.

"It's our first SmartRig, and hopefully the first of many," he said, adding "it's getting very hard to get skilled operators and these rigs reduce the training time, and the knowledge and expertise that we need to operate the machines because they're taking care of a lot of it for us.

"There's a lot less risk of damage to the rigs, like squashed rods and bits and pieces like that. So there are some huge cost benefits there for us."


Ian Rose of Yilgarn Drill and Blast had some reassurance for Rock and other new SmartRig owners. He said the company had three SmartRig units deployed in Western Australia, the 'oldest' having delivered

three years and 6 500 hours of service.

Rose said the benefits of the technology and new design features highlighted at the launch were a reality. "Probably the most significant benefits I've seen to date are the availability of the machines, and the ease of maintenance," he said. "Being able to diagnose faults quickly and easily is obviously a key advantage, and with new operators it is just easier to teach them how to get the most out of the drill rig."

Exceptional run

"We've had an exceptional run with three of these rigs," added Rose. "The availability, maintainability and performance has been a real advantage for us in a competitive contract drilling market. We haven't gone below ninety five percent availability."

Olav Kvist, Product Manager, Automation for Atlas Copco, pointed out that the SmartRig brings precision in drilling, documentation, and repeatability. "Without that there is no need to even try to do continuous improvement. Of course, there is also the safety aspect – miners want to remove people from the bench; they want to get rid of service trucks from a working pit. That's a safety risk that can be removed from the equation. Sure, they need to be there surveying the first time, but not repeatedly to assess and monitor how they are drilling." 



MILESTONE

Experienced to the core: Drillers Larry Barnesky (left), and Bline Meuse of Major Drilling with the new Excore bit during successful trials in Manitoba.



IN MANITOBA

New Excore scores high in Canadian trials

A leading core drilling expert in North America has been testing the new generation diamond core bits in tough conditions in the hills of northern Manitoba, Canada. Below, their Excore experience.

Major Drilling is one of North America's most respected core drilling experts. Its experienced drillers have pulled core samples from sites in northern Canada to the mountains of Mexico. But it was in the Manitoba region where they recently discovered some of the hardest rock they have ever encountered.

It was therefore the perfect testing ground for the latest core drilling bit from Atlas Copco – Excore, a new generation of diamond drill bits that offers superior bit life and penetration rates.

The series was officially launched in Canada earlier this year at Toronto's PDAC show where many diamond drillers expressed their interest in trying the bits out.

Major Drilling, however, has been testing the bit for more than a year, at times using it to drill 700–730 m holes. At this depth, previous bits used were getting 30 to 60 m per bit. Changing to the Excore pushed that performance rate to 90–140 m per bit with


an average penetration rate of 20–30 centimeters per minute.

“When it takes four hours to change a bit that's 700 metres down a hole, fewer bit changes are definitely better,” says driller Larry Barnesky. “We don't make money unless we're putting core in the box.”

Controlling the pressure

Major Drilling is using the Atlas Copco Diamec U8 drill rig and Barnesky points out that it doesn't require excessive pressure on the bit, adding “pressure takes a lot of the life out of your bit.”

Drilling here requires 1200 to 1300 rpm and the Diamec U8's power unit allows the operator to slow down and add pressure if necessary.

In addition to Canada, the Excore has been tested in South Africa and Sweden with equally successful results and is generally being described as a milestone in core drilling technology. 



DECADES OF DEVELOPMENT

The new Excore bit line has been engineered by a global Atlas Copco team and combines decades of practical experience with the latest in manufacturing and metallurgical technique.

The result is a bit that achieves greater penetration rates and an extended service life. Drillers using Excore bits can drill both faster and deeper, and spend less time changing bits.

The metallurgy and design of the bits allow their use in a wider range of applications than their predecessors. Drillers can reduce the types of diamond drill bits usually required to tackle different rock conditions on site. With simplified bit selection, productivity and cash flow are improved.

Normally, a variety of bits are kept on hand for all possible ground conditions on the site. As Excore can perform in various formations, it means fewer types of bits need to be kept in stock. In addition, fewer bit changes means fewer trips pulling rods, which saves time.

TRAINING FOR drill rig operators

USA Training drill rig operators with the aid of simulators is gaining in popularity, rapidly becoming the method of choice for mines around the world.

Atlas Copco is a forerunner in driving this trend and now offers simulators for most of its surface and underground equipment, the latest of which is a new simulator for training operators of Pit Viper blasthole drills.

These modules provide extremely realistic and effective training for operating such large rigs as the new Pit Viper 235 in a safe and controlled environment.


“The simulator will be used as part of our Master Driller programme,” says Peter Lawrence, Technical Services Manager Parts and Services. “The opportunity to learn in a realistic environment will allow operators to thoroughly familiarize themselves with these rigs before taking the controls in the real thing. “This means new



Effective and realistic: Atlas Copco's new Pit Viper training simulator in "action" in Texas.

operators can contribute more rapidly to a company's operations.”

Simulator training has proven to have a positive impact on performance and reliability as operators learn to avoid causing

unnecessary wear and stress on key components. In addition, it enables training to take place away from the site so that working rigs can continue to focus on production. 

IN BRIEF



Drilling in the coalfield: The Pit Viper 235 is tested for multi-pass rotary drilling down to 46 m (150 ft) in a mid-western coal mine in the USA.

MINExpo star well proven

For the past 18 months Atlas Copco's Pit Viper 235, which was one of the big attractions at MINExpo 2008, has been undergoing rigorous testing in quarry, gold and coal mining operations.

This 152–251 mm (6–9 7/8") blasthole drill has been designed to limit non-drilling time during a blasthole drilling cycle, thereby increasing productivity.

The first drill was tested in a rock quarry in Austin, Texas, and later moved on to a mid-west coal mine where it is now set up for low pressure rotary rig drilling of 229–251 mm (9–9 7/8") diameter holes up to 46 m (150 ft) deep.

A second rig has been operating in a gold mine in western USA since January this year where it is set up for high pressure DTH drilling of 152 mm (6 3/4") diameter holes up to a depth of 13 m (42 ft) Both ma-

chines feature a hydraulic, smart wet clutch between the air compressor and the engine (patents pending). Orders for the PV-235 have been received from Canada, Indonesia and Australia.

Unique boost for rotary drilling

Atlas Copco Secoroc has launched a unique system designed to boost the performance of rotary drilling rigs. Called the PARD System, it combines the best of DTH and rotary drilling technology for mines seeking step-change technology that yields lower operating costs.

The system is based on lightweight, fast cycling, low impact DTH hammers with specially adapted tricone drill bits, for standard rotary drill rigs and drill strings. The result is a combination of percussive power and rotational force. Drilling costs are kept to a minimum, and more holes per shift can be drilled than ever before and collaring is smoother.

Rock drills for tough conditions

Atlas Copco has launched three new heavy duty versions of its COP 1800 series hydraulic rock drills, specially designed for face drilling underground in tough conditions. The newcomers – COP 1638HD,



Reporting for duty: COP 1800HD from the new heavy duty series, designed for face and long-hole drilling in the hole range 38–64 mm.

COP 1838HD and COP 2238HD – feature a new side bolt design that minimizes the risk of impact piston miss-alignment and secondary damage to internal parts. This design also improves serviceability.

Peter Bray, Product Manager, says: “We have been field testing them under extremely demanding conditions and they have all performed beyond expectation.”

Stepping up in the Congo


Atlas Copco has opened a new customer centre in the Democratic Republic of Congo to bring an increased range of products and services closer to existing and new customers in the country.

Located in Lubumbashi, the centre has a branch in Kolwezi and plans to open an additional branch in Kinshasa.

Big Boomer to Veidekke

SWEDEN Scandinavian contractor Veidekke has taken delivery of a top-of-the-line, four-boom Atlas Copco drill rig to be used for tunnelling work on the Vänerbanan railway expansion project.

The Boomer XE4 rig is equipped with BUT 45 booms for fast positioning and maximum stability, four COP 3038 rock drills as well as the mechanized rod handling system RHS which is a unique, optional feature for extension drilling with the Boomer E-series.


Veidekke has commissioned the rig to drive its section of the project near Gothenburg. Vänerbanan, also known as Nordlink, connects Scandinavia with continental Europe and is being upgraded from a single-track to a twin-track system for high speed trains. 



Big boy for a big job: Veidekke's new Boomer XE4 is being used to drive a twin-track tunnel near Gothenburg for high speed trains.

Pit Viper fleet for Batu Hijau

INDONESIA: The Batu Hijau copper and gold mine on the island of Sumbawa has decided to upgrade its current fleet of Atlas Copco DM and DML drill rigs to the larger Pit Viper rotary rigs by the end of this year. The mine has placed an order for six rigs – four PV-351s as well as two PV-235s – bringing its Pit Viper fleet to seven.

Batu Hijau was opened in 1997 and five DM rigs were initially acquired for the start-up of the project. These have now topped more than 60 000 hours. The mine already had one PV-351 which was acquired in late 2006. All rigs at the site will be equipped with the automation platform RCS and automatic drilling and levelling 

Footnote: Batu Hijau is owned by Newmont, the world's second largest gold producer and reported sales in 2009 of 500 million pounds of copper and 10 million ounces of gold.



Bound for Sumbawa: From left, Atlas Copco's Dustin Penn with Hanung Hartono, Maintenance Foreman, Drills, and Tim White, Superintendent Maintenance, Drills and Shovels, of Batu Hijau, during an inspection of the PV 351 at the factory in Texas, prior to delivery.

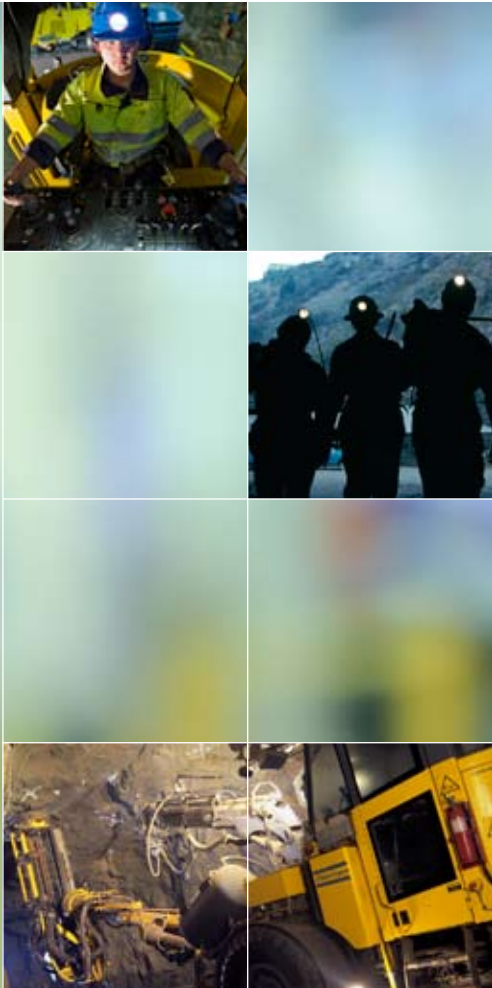
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