

# Mining & Construction

A magazine from Epiroc

miningandconstruction.com

INSIDE

The Change  
Issue 02-2021

FACE TO FACE

**Super support**  
First-class servicing – a pillar for KCS partnership  
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INNER WORKINGS

**Almost too good to be true**  
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MY WORK

**She does the math**  
Angelique LaFontaine loves heavy machinery  
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[ Our Customers ]

## Youth united

Erik Nubberud goes from strength to strength with tight-knit group of eager drillers.

08-13



# Running with the times

**D**EAR CUSTOMERS, our industry is evolving quickly. If we gaze into the crystal ball, what do we see ahead for the mining and infrastructure industries?

Undoubtedly, products, services and solutions will become even more automated, digitally connected and electrified. We are working hard to provide you with the best solutions in these areas to improve operators' safety and work environment, lower emissions, and enhance your productivity.

One recent change at Epiroc is that we have started to roll out diesel-to-battery conversion kits for loaders. Conversion for the Scooptram ST1030 loader is now available through most of our Customer Centers worldwide, and more machine models will follow.

**WE HAVE MADE** several acquisitions in 2021 that will further support our work to provide you with automation, digitalization and

electrification solutions that optimize your performance.

These acquisitions include Meglab, which provides mining companies with the electrification infrastructure needed to start using battery-powered machines; MineRP, whose leading software platform optimizes mines' operations; Mining Tag, which uses sensor-based solutions to make mines more safe and productive; 3D-P, which provides wireless connectivity solutions to surface mining companies for successful implementation of autonomous solutions; and Kinetic Logging Services, whose high-tech measurement services increase the accuracy of surface mining production.

We recently launched a new vision, *Dare to think new*. As our industry keeps evolving, we must consider new, brave solutions – and always with you, our customer, in mind. We hope you enjoy reading this issue, the main theme of which is, indeed, change. ✕

## On my radar

### Acquisitions

We will continue to look for strong companies that can help us in our drive to support customers.

### Supply chain

One effect of COVID-19 has been more complex inbound transport of components and outbound delivery of finished products. Our teams are working hard to ensure delivery to customers is as efficient as possible.

**Stay safe and keep evolving!**

**Helena Hedblom**

Epiroc President and CEO

Epiroc is a 145+ year old start-up; a dynamic new company, built on long and proven expertise and experience from the mining and construction industry.



## About Epiroc

Epiroc is a leading productivity partner for the mining and infrastructure industries. With cutting-edge technology, Epiroc develops and produces innovative drill rigs, rock excavation and construction equipment, and provides world-class service and consumables. The company was founded in Stockholm, Sweden, and has passionate people supporting and collaborating with customers in more than 150 countries.



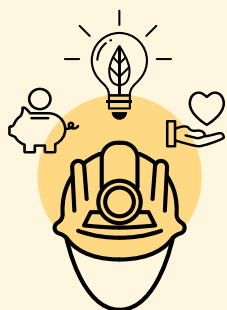
# Epiroc Group – get to know us better

Our innovations

Industries we serve

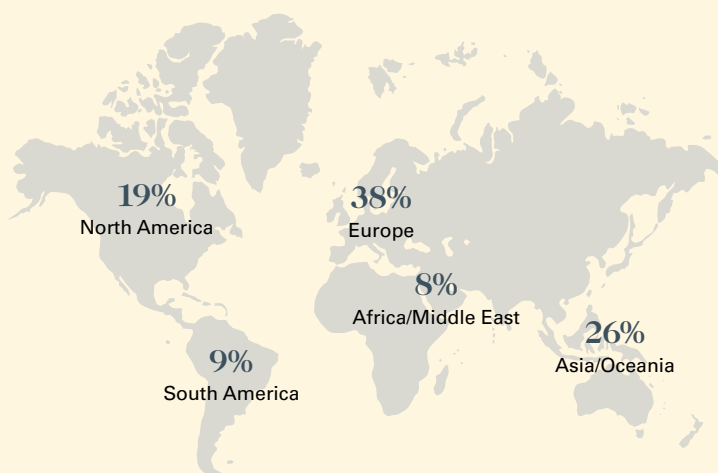
Share of Epiroc connectivity equipped products

Our solutions aim to solve our customers' key issues – including requirements to reduce operating costs, increase productivity, increase utilization of equipment, reduce environmental impact, and enhance health and safety conditions.



- **Mining and quarrying**  
Underground mining, surface mining, exploration, quarrying, well drilling, energy.
- **Infrastructure**  
Underground civil engineering, surface civil engineering and urban development, deconstruction and recycling.

Grand total is more than 5500 globally.



## The Group in numbers



15 000

- About 15 000 employees.
- Customers in more than 150 countries.
- 145+ years of experience.
- Revenue in 2020: SEK 36.1 billion.

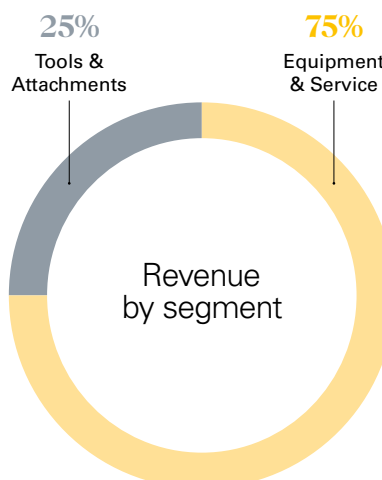
### Tools & Attachments

Dedicated to rock drilling tools and hydraulic attachment tools, used for rock excavation, mining, construction, demolition and recycling. Also provides related services

### Technology & Digital

Dedicated to technology solutions, and drives the automation and digitalization expansions for Epiroc's divisions

## Divisions and reporting segments Equipment & Service / Tools & Attachments



### Surface

Dedicated to rock drilling equipment for use in surface mining, exploration, construction and quarries, as well as water well and energy applications

### Underground

Dedicated to a wide range of underground mining and tunneling equipment

### Parts & Services

Dedicated to parts and services aimed at maximizing customers' productivity

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# Change

Change is unavoidable, one way or another. Accepting change is often the best path forward.

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## “The feed saves a lot of time”

Norrbottnens Bergteknik invested in four of the latest generation SmartROC D65 rigs for “contour drilling” at the Aitik mine. Thanks to the extra-long feed, productivity has increased 10–15 percent.

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## Digital transformers

Epiroc believes in allowing data integration and automation in platform-type systems. Acquiring software company MineRP helps achieve further digital advancements.

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## Silencing the skeptics

Mining close to the tiny hamlet of Ravenswood in northeast Australia is subject to strict environmental constraints. Epiroc had to reduce the noise of the SmartROC rigs used by Roc-Drill.



#### ON THE COVER

While only 27 years old, Erik Nubberud has achieved a lot. Instilling a strong sense of community and hiring skilled craftsmen who enjoy new challenges at work are proving to be the ingredients for success at Erik Nubberud Fjellsprenging AS.



The 2022 edition of Investing in African Mining Indaba, originally scheduled for 7–10 February 2022 will now take place 9–12 May 2022 at the CTICC, Cape Town, South Africa. Following a record 30% female speaker line-up in 2020, one in three speakers will be female in 2022.

[www.miningindaba.com](http://www.miningindaba.com)



OUR CUSTOMERS

# “Reliability means everything to me”

Gaining trust and a good reputation is vital when Erik Nubberud builds his business. Cooperation with Epiroc has helped him on this journey.

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**Mining & Construction** is published by Epiroc. The magazine focuses on the company's know-how, products and methods used for mining and construction worldwide.

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# EPIROC IN BRIEF

## EPIROC ACQUIRES CUTTING-EDGE COMPANIES

**E**piroc continuously seeks to develop and expand its offering to stay ahead. One means for doing this is strategic acquisition of cutting-edge companies, and this year there have been several. In Q2, Epiroc acquired 3D-P, Meglab, and Kinetic Logging Services.

**3D-P**, based in Calgary, Canada, provides reliable wireless connectivity solutions for mining companies within surface mining. A robust wireless network is crucial to enable mining automation, including teleremote and autonomous operations. 3D-P is active in North America, Chile, Peru and Australia. It has about 50 employees and had revenues in 2020 of about USD 12 million (SEK 110 million).

**Meglab**, based in Val-D'Or, Quebec, Canada, is a technology integrator that designs, manufactures, installs and supports practical and cost-effective electrification and telecommunications infrastructure solutions to customers in several countries. Its products and solutions include system design, substations, switchgears and automation system solutions, enabling the infrastructure needed for mine electrification and equipment



EPIROC

Epiroc is committed to providing its full range of mining equipment in battery-electric versions by 2030. The acquisition of Meglab will be a key component in providing the infrastructure needed for mining electrification.

charging solutions, as well as for digitalization and automation of operations. Meglab has more than 240 employees and had revenues in 2020 of about CAD 49 million (SEK 335 million).

**Kinetic Logging Services**, based in Perth, Australia, provides mining-technology measurement services to build improved geological models that help mining companies increase productivity. The company's flagship product is OreSight, a highly advanced solution that provides near real-time borehole assay data and grade information. The mining companies feed this data directly into their blast pad mod-

els, allowing them to make improved decisions on production and ore blending. The company has about 200 employees and annual revenues of about AUD 30 million (SEK 195 million).

Epiroc also acquired **Mining Tag**, a Chilean company that develops and implements sensor-based solutions that allow monitoring, automation and process improvement of mining operations. The solutions are mainly used in underground mining. Mining Tag is active in several countries in Latin America. It has about 120 employees and had revenues in 2020 of about USD 7 million (SEK 65 million). ✕

### Swedish collaboration on electric trolley truck system

**EPIROC, BOLIDEN** and ABB will develop and demonstrate an electric trolley truck system on a test track in the Kristineberg mine in Sweden. The electric trolley truck system is a vital component in enabling heavy transportation with electric driven battery vehicles. This development project will

lower carbon emissions, improve work environment and contribute to Boliden's vision to be the most climate friendly and respected metal supplier in the world. The electric trolley assist concept is highly suitable for long haul ramps and builds on Epiroc's proven Minetruck MT42 Battery.

### Epiroc takes the lead in NEXGEN SIMS project

**EPIROC IS LEADING** a new European Union-funded collaboration project together with several mining companies, equipment and system manufacturers and universities. The three-year project, called NEXGEN SIMS, will support new technologies, methods and processes that enable

more sustainable and efficient carbon-neutral mining operations. A key aspect of the project is to develop autonomous carbon-neutral mining processes. NEXGEN SIMS builds on the successful EU-sponsored H2020 SIMS project, also coordinated by Epiroc, which ran between 2017 and 2020.





## Epiroc introduces the Pit Viper 291

**EPIROC IS PROUD** to introduce a new version of the iconic Pit Viper drill rig. The Pit Viper 291 single-pass rotary drill is designed to tackle larger diameter drilling in soft to medium ground conditions. Thanks to the Rig Control System (RCS), the Pit Viper 291 can be configured with scalable automation features, including fully autonomous drilling.

### FIGURE

30%

## Lower costs with Epiroc Reman Program

**THE REMAN PROGRAM** is an alternative to new components, local service exchange programs and repair and return service. It provides components at prices lower than the cost of new components (approx. 30%), as well as improved operational and TCO cost savings. It is an exchange-related sales transaction whereby the customer returns a used core to Epiroc in exchange for a remanufactured component.

*Being faced with change is part of life – and business. But how to tackle change?*

## Thinking new; what does that mean to you?



**Brenton Armitage**  
General Manager Epiroc Kinetic Logging Services, Australia

“To be challenged by concepts and ideas; to be outside your comfort zone. Exceptional outcomes are achieved by challenging the status quo through true innovation. To do amazing things, you have to do something different and be prepared to fail at times.”



**Kim Valade**  
General Manager Meglab, Canada

“*Dare to think new* is an inspiring vision of courage, curiosity, creativity and collaboration. It's about pushing limits and working side by side to achieve our goal of a green, safe and efficient mine. You must be determined to turn challenges into strengths.”



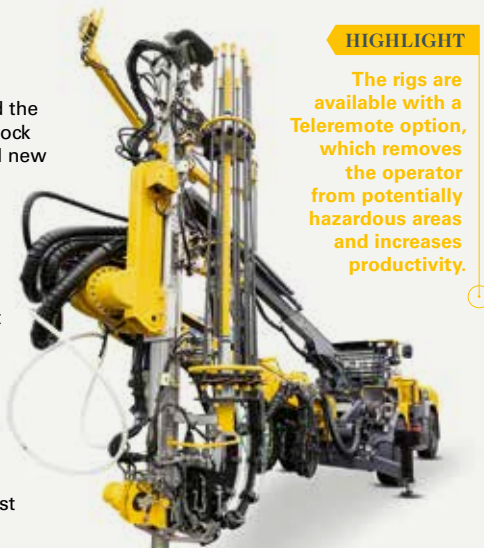
**Walter Chang**  
CEO 3D-P, Canada

“I'm inspired by the Epiroc leadership's message that technology and how it is used creates opportunities – opportunities that require a different way of thinking to come to fruition. My favorite quote was: ‘Sometimes you have to jump into the cold water and think new.’”

### PROJECT NEWS

## New Boltec rig sets industry standard

**AT MINEXPO**, Epiroc introduced the benchmark for underground rock reinforcement with two brand new rig versions: Boltec M10 and its larger version Boltec E10. The two new rigs are fully mechanized rock bolting rigs for medium and large sized tunnels. They are designed to improve productivity and bolt installation quality thanks to intelligent options and compatibility with different bolt types, without compromising on safety. Good quality rock reinforcement equals increased safety for everyone in the mine and tunnel, not just the operator.



### HIGHLIGHT

The rigs are available with a **Teleremote option, which removes the operator from potentially hazardous areas and increases productivity.**

**More** [www.epiroc.com/boltec10e10](http://www.epiroc.com/boltec10e10)



[On Location]  
Norway

# UNITING TO DELIVER EXPLOSIVE POWER

Erik Nubberud has his sights set on young, eager miners and rock excavators from his own home town. This has made the company take off even faster than he had ever hoped – with Epiroc as a reliable partner.











Driller and rock blaster Sondre Martinsen performs pre-split drilling in order to make a breaking point in the rock and avoid any damage.

**THE EMPLOYEES** at Erik Nubberud Fjellsprenging AS aren't one big family, they certainly have a tight-knit relationship. Of the nine employees, two of them are brothers. Most of them grew up in the same municipality and have parents who know each other well. Several of their fathers have had the same profession.

**Erik Nubberud**, owner and general manager of the Norwegian company, is keen to employ skilled workforce who enjoy new challenges at work and who are knowledgeable and respectful of the powerful forces found in rock and explosives. And it's important that his employees work well together.

"Their work ethic and sense of community have helped me grow faster than



**Erik Nubberud**  
Owner and  
General Manager,  
Erik Nubberud  
Fjellsprenging AS

sees the drill rigs in action, and watches how his employees carry out their assignments. At the same time, he has to manage the company and calculate quotes.

"Both are important, but it's crucial to keep the balance. If we become too big, I won't be able to spend as much time out on site," says Nubberud.

He shows us around Skarsnuten Panorama in Hemsedal Municipality in

I had planned," says Nubberud.

At the age of 27, he's the oldest member of the company. Nubberud thrives on the construction site. This is where he

meets customers,

southern Norway. This will soon host two floors of new vacation apartments, as well as an underground parking garage. Thirty meters further up the hill, the owners of the apartments in project stage one and two have already put up curtains and moved in furniture. The third stage of construction is now underway.

Erik Nubberud's colleagues prepare construction pits for new apartments and delivery routes. The work, which began in June, will take four months to complete. Last winter, they also performed wire rope sawing at a new hotel in the area. They made drill cuttings in the mountain five meters high and blasted right up to the walls of the hotel. They worked in snow and temperatures as low as minus 15°C.



## Erik Nubberud Fjellsprengeing AS

- Medium-sized Norwegian company that mostly takes on work blasting plots of land, ditches and roads, as well drilling and blasting in quarries. They also perform precision blasting, wire sawing, tunneling through mountains, and rock reinforcement work.
- Started by Erik Nubberud in 2016, after training in civil engineering at Kongsberg college. He completed his apprenticeship at a blasting company where he was later employed.
- Eight employees who are all rock drillers and blasters, and one apprentice.
- They take on assignments throughout Eastern Norway in a radius of 250 kilometers from Oslo.
- Has six drill rigs from Epiroc and a Husqvarna DXR 300 with an Epiroc SB302 hydraulic breaker.

**IN THE BACKGROUND**, driller and rock blaster **Sondre Martinsen**, 23, performs pre-split drilling. The purpose of this is to make a breaking point in the rock to avoid any damage of the rock beyond where they have planned.

The machine he operates is a FlexiROC T35 R drill rig. At a speed of 1.5–2 meters per minute, the rig drills eight meters into the rock. There are 20 centimeters between each hole, and each hole has a diameter of 76 millimeters.

“This was the kind of work I wanted to do when I started as an apprentice with Erik five years ago. Operating the rig and firing off the explosives makes for an exciting work day,” says Martinsen.

Using the remote control, he moves the 15 ton machine easily around the construction site, making it possible to work precisely and efficiently. The drill rig that Martinsen controls replaced a FlexiROC T30 R, which fell over a short time ago. No employee was injured in the accident, but the machine had to be serviced by Epiroc. The day after the accident, Epiroc sales engineer Johnny Ryen Johansen made sure that the T35 R was in place.

“Reliability, and that we deliver on our promises, means everything to me. This is how we gain trust and a good reputation. Here, the cooperation with Epiroc is important,” says Erik Nubberud.

He adds that Epiroc machines are reliable, but that accidents can happen.

“It shows how important it is to use the remote control, as the operator had also done in this case. This minimizes the risk of injury.”

**SIX OF THE SEVEN** drill rigs used by the company are from Epiroc. A high degree of reliability and machines that are well-suited to Erik Nubberud Fjellsprengeing’s varied assignments were a crucial part of his choice. The fact that most aspects of operation can be arranged through a single phone number is efficient – whether parts need to be replaced or instructions are needed on the use of the machines. It also makes it

The FlexiROC T35 R drills eight meters into the rock, each hole with a diameter of 76 millimeters.



**Sondre Martinsen**  
Operator,  
Erik Nubberud  
Fjellsprengeing AS

easier for employees to be able to refer to a single management system. Having a good line of communication with Epiroc is also useful for getting the best deals when replacing machines.

The joy of doing a variety of different tasks at work is something that motivates the employees we’ve spoken with. They’ve had the chance to see a lot of Norway and have worked in both urban and natural settings. No workday is the same, just like the rock they work with.

Part of the reason Erik Nubberud began working for himself in 2016 was the opportunity to manage his own workday. The freedom to choose his direction of work, prioritize assignments himself, and build his own corporate culture made him take the chance at starting the company.



## “When hammering rock 50–70 times a second at 35–40 tons of pressure, it’s crucial to have the right equipment”

**Erik Nubberud**

Owner and General Manager, Erik Nubberud Fjellsprenging AS

Today he has worked all throughout Østlandet – which, in practice, is a radius of 250 kilometers around Oslo. He wants to be welcoming to his customers and to be perceived as a positive supplier of his services. His good reputation has also contributed to several assignments. In 2018, he had revenue of NOK 15.5 million. By 2020, the figure was 25 million. However, Nubberud reiterates that right now the company is as big as it should be.

“If you ask my partner, she’d probably say I spend most hours of the day working,” says Nubberud.

**WHILE THEY HAVE** a wide variety of work assignments, some are a little more special than others. Such as when a cottage owner in Hemsedal wanted to build a swimming pool under his cottage. The cabin was built on a mountain, so they had to carry out primary rock breaking, drilling, and blasting right under the living

room floor. Erik Nubberud purchased a Husqvarna DXR300 with an Epiroc SB302 hydraulic hammer. The primary rock breaking was performed with a remote-controlled machine, while they used a handheld hammer drill and compressor for drilling. After blasting, the machine excavated a 500 cubic meter mass. The cottage floor was kept intact and the pool was put into place.

The drill bits Erik Nubberud Fjellsprenging uses on the drill rigs are from Epiroc. They undergo heat treatment and hardening, which makes for a long lifespan.

“When hammering rock 50–70 times a second at 35–40 tons of pressure, it’s crucial to have the right equipment. If the joints of the rods get stuck and the rods bend, it can lead to stoppages and drilling errors,” says Erik Nubberud.

He adds:

“I’m keen to deliver the best possible services to our customers. And if we can’t deliver what customers want because of the characteristics of the rock, it’s important to explain the reason to the customer.” ✕

### Erik Nubberud Fjellsprenging AS and Epiroc

**DRILL RIGS USED** by Erik Nubberud Fjellsprenging AS are the FlexiROCT15 R, FlexiROCT30 R, FlexiROCT30 R, four rigs and FlexiROCT35 R from Epiroc. These were chosen for their reliability and good drilling capabilities. Variation in the size and characteristics of the rigs is important for the company to be able to work as well in narrow urban environments as in large, open quarries. The company also buys most of the drill bits they use from Epiroc.



### Skarsnuten Panorama

- Located in Hemsedal Municipality, southern Norway. Vacation apartments are being constructed in three projects. There is also a hotel in the same area.
- Erik Nubberud Fjellsprenging AS carries out blasting, pre-split drilling and rock protection for the apartments to be built. They also do blasting work for culverts and have carried out wire sawing and blasting at the hotel.





Skarsnuten Panorama in Hemsedal Municipality in southern Norway will soon host two floors of new vacation apartments as well as an underground parking garage.

## FIVE KEYS TO SUCCESS

<p><b>1</b> Controlled growth</p> <p><i>Started with one employee and one drill rig. Growth has been steady, but has been kept in line with new assignments and new colleagues. A good reputation gives rise to a slow but undoubtedly positive ripple effect.</i></p>	<p><b>2</b> Spending time on site</p> <p><i>Because Erik Nubberud wants to be able to spend time with the employees, the company won't become too big. Training and working on how to overcome challenges together requires his presence.</i></p>	<p><b>3</b> Employee selection</p> <p><i>It's important to find employees who are able to both receive and take responsibility, because it's up to them to overcome challenges on their own when they're out at the facilities. They also have to work well together on the job.</i></p>	<p><b>4</b> Understanding the customer</p> <p><i>Understand your customer's needs and suggest solutions when needed. This is why Erik Nubberud spends a lot of time at the sites. It's important to stay flexible and to be able to come out on short notice when needed.</i></p>	<p><b>5</b> Reliable machines</p> <p><i>Breakdowns are costly and present major challenges. Close cooperation with Epiroc provides operational reliability and good service plans. It is also economically beneficial to renew the drill rigs at the right time.</i></p>
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### SmartROC D65

- Built to face the toughest of conditions and loaded with intelligent features such as automated drilling and rod handling.
- One or more drill rigs can be operated remotely with the BenchREMOTE option.
- Extra long feed with 8 meter pipes makes it possible to drill 16 meter production holes with just one rod-adding.
- Possible to drill 229 mm holes (9 inches) thanks to the power of the COP M7 hammer.
- Uses 300 liters less hydraulic oil than previous versions and has fewer hoses and pumps.

The new, easy-to-use, touchscreen in the SmartROC D65 simplifies the work for Pierre Medfors and his fellow operators.



# Feeding the need

»»» Norrbottens Bergteknik was looking to develop its work at the Boliden Aitik copper mine, located in the far north of Sweden. The decision was taken to use the latest generation of SmartROC D65 with extra long feed (XLF), which saves a lot of time during drilling.

**A**T AITIK, a copper mine located one hour north of the Arctic Circle, deposits of copper ore, which contain copper, gold, and silver, are mined 24 hours a day. It is one of the biggest open pit copper mines in Europe. Since February 2020, Norrbottens Bergteknik has been carrying out “contour drilling”, otherwise known as line drilling, on every level on behalf of mine owner Boliden. Before this assignment got underway, the company invested in four SmartROC D65 rigs of the latest generation from Epiroc. **Kenneth Lindberg**, Project Manager at Norrbottens Bergteknik, picks up the story.

## Why did you decide to buy these new rigs?

“Because they have extra long feeds. The feed is so long that it can handle an eight-meter long drill rod, so despite the fact that the blasting depth is between 15 and 15.5 meters, only one threading is required. Otherwise, two rod changes would be necessary. This saves a lot of time. In addition, because so many mining companies in the region have chosen to invest in SmartROC D65 rigs, there is good access to servicing and spare parts.”

## How have they performed?

“Productivity has increased 10-15 percent, which we’re very happy about. However, we haven’t done much remote operation yet, partly because in certain parts of the mine there’s so much water that the rigs can’t be operated using BenchREMOTE, since we have to place out col-

laring pipe in each hole. With a new mine extension, we’re blasting three bench heights, or 45 meters, and now we see good potential for use of the BenchREMOTE, since the rock does not contain as much water and since there is not as much rock debris. When we drill with SmartROC D65, the bottoms are made so even and fine that you can then place collaring pipes without any problem. One operator controls two rigs, increasing safety at the rock face for the operators.”

## Your SmartROC D65 rigs have been equipped with new touchscreens.

“That’s true. Initially, we experienced a whole host of run-in problems. We agreed to pilot the new screen and, to begin with at least, it was so memory-hungry that the whole system slowed down. However, since the software was updated everything’s run as smooth as silk. The operators are happy and are reporting that the screen is easy to use. They receive accurate and easy-to-understand information, and accessing menus is now simpler than ever before. It’s also easy to change settings.”

## How has the service and collaboration with Epiroc worked?

“We’re very satisfied. Epiroc has personnel stationed in Aitik, so help is available 7 days a week. It goes without saying that, during the pandemic, it has been difficult to obtain spare parts, but everyone has faced similar difficulties. In respect of service, we have a schedule based on a thousand hour cycle. This means servicing takes place at regular intervals, becoming more extensive during the cycle. Epiroc’s technicians are highly skilled.” ✕



**Kenneth Lindberg**  
Project Manager,  
Norrbottens  
Bergteknik



[On Location]  
Sweden

More [www.epiroc.com/smartroc-d65](http://www.epiroc.com/smartroc-d65)



Ensuring growth  
through partnership

# WORKING TOGETHER

» KÇS Kipaş Çimento relies on a close supply and servicing relationship with Epiroc to keep its expanding cement production operations running smoothly.

**MUSTAFA  
YILMAZ**

KÇS Cement  
Maintenance  
Chief, based in  
Kahramanmaraş,  
Turkey.



[On Location]  
Turkey





**I**N 2006, TURKEY-BASED conglomerate KİPAŞ Holding established KÇS Kipaş Çimento in Kahramanmaraş to focus on cement and clinker production. It purchased Epiroc drill rigs when setting up operations, and work was soon underway at a quarry site roughly halfway between Kahramanmaraş and the city of Gaziantep. This marked the start of a close relationship between the two firms, with KÇS enjoying a period of rapid growth. When it was time for KÇS to expand operations further, it purchased newer Epiroc units while continuing to run the older models with the help of regular servicing from Epiroc’s Adana office.

Mining & Construction Magazine sat down with KÇS Cement Maintenance Chief **Mustafa Yılmaz** and Epiroc Tools & Attachments & Surface division Sales Engineer **Erman Çeliker** to discuss their working partnership.

*How did the relationship between KÇS and Epiroc begin?*

**MUSTAFA YILMAZ:** “When we first decided to invest in the cement factory in 2006, we did research [on drill rigs] first. As a result



**ERMAN ÇELIKER**  
Epiroc Tools & Attachments & Surface division Sales Engineer, based in Ankara, Turkey.





For many years, KÇS Cement has been using Epiroc drill rigs at the quarry site in Kahramanmaraş Province, Turkey.

of this research, we decided on Epiroc. It had the strongest references from our peer companies that had used its equipment and had good experiences with it. We considered the efficiency of the product range, the availability of spare parts, and the speed of service.”

**ERMAN ÇELIKER:** “When I started as a sales engineer in this region and met Mustafa, the relationship between Epiroc and KÇS was already highly cooperative. KÇS has had two ECM580 units for over 10 years, and now the company has two newer PowerROC T35 units, the most recent of which it bought last year. We have a dealer in Adana, Turkey, with whom Mustafa is in close contact and who provides services focused on efficiency and low costs. KÇS is our biggest customer in the region and our biggest reference for the PowerROC series.”

*Are there any particular challenges posed by the operations at KÇS’s quarry site?*

**MY:** “We can come across very tough ground here as well as different ores and variable rock formations, some of which are extremely hard. These changing geological formations are not always easy to deal with.”

**EC:** “The rock formations are not homogeneous here. KÇS can face soft rocks when drilling and then, right afterwards, much harder rocks. The

technology of our rigs helps keep the consumables safe when this is the case and also provides good costs per meter drilled.”

*KÇS is using both older and more recent models of Epiroc equipment. How do they compare, and how do you keep the older models running smoothly?*

**MY:** “The newer ones have more capacity and are faster. That’s the main reason we prefer them. They are also more fuel efficient. These are advantages when drilling on the different kinds of ground we have at the site.”

### In Focus: KÇS Kipaş Çimento

**KÇS KİPAŞ ÇİMENTO** in Kahramanmaraş is a subsidiary of Turkey-based conglomerate KİPAŞ Holding. It began cement and clinker production in 2008 and quickly became one of Turkey’s leading cement producers. KÇS now has an annual production capacity of 3 200 000 metric tons of clinker and 4 000 000

metric tons of cement and is continuing to grow and invest in order to pursue new opportunities in the construction materials sector.

- Approximately 1 000 employees
- Founded in 2006
- Operates 15 concrete plants across seven different Turkish provinces

**More** [www.kipas.com.tr/sectors/cement/cement](http://www.kipas.com.tr/sectors/cement/cement)



**EC:** “What is most gratifying is that KÇS has continued to work with us [on the older models]. They use original spare parts, and they call our original servicing. It’s like having a 15-year-old Mercedes and going to the official dealer to get it serviced – it’s that kind of loyalty.”

**RM:** “There are some key components [to those rigs], and we always prefer buying the original parts. One of the machines that we bought in 2006 has 45,000 engine hours. And it still runs like new because of servicing from Epiroc’s service center and use of original parts.”

**EC:** “One of the reasons for the upgrade is that Epiroc has come up with new technologies, like the COP Logic system and the COP SC19 series rock drill, which are extremely efficient and help the most important part of the drilling process move faster. The anti-jamming system also helps ensure the safety of the drilling process and the consumables.”

*How important are servicing and spare parts arrangements, and what do those arrangements look like from each side?*

**MY:** “Epiroc has been very fast in meeting our needs because Adana and Kahramanmaraş are very close to each other, so they are able to get to us quickly. [If we need anything,] our marketing department contacts the Adana office, and things start from there with the service provided very soon after that. We are very satisfied with that service.”

**EC:** “Service accessibility, speed of service and speed of response when supplying spare parts are our main points of focus. Because of them, KÇS can still use those Epiroc rigs that are older. When it comes to supplying the spare parts, they are shipped from Örebro, Sweden, to our Ankara warehouse, and from there we distribute them to Adana and elsewhere and then on to our customers.”

*KÇS is continuing to expand and is planning for further growth. How do you see the relationship between the two firms developing in future?*

**MY:** “We are continuously investing in new projects. We are closely watching the market (for cement), and we expect more growth to come here and in the Middle East. So, we are planning to buy new quarries, even in Adana, and planning to invest more. When we open new quarries, we will need more equipment, and of course we will work with Epiroc to supply that.”

**EC:** “Looking to the future, the digitalization of the drilling processes here is still in progress, and KÇS is willing to upgrade its systems. When it does, we will be in close contact and continue to maintain the good relationship we have built.” ✕



**Mustafa Yilmaz**  
Maintenance Chief,  
KÇS Cement



**Erman Çeliker**  
Sales Engineer,  
Epiroc



## KEYS TO A SUCCESSFUL PARTNERSHIP

Successful, consistent operations rely on a close relationship between the client and the equipment supplier. KÇS’s Mustafa Yilmaz and Epiroc’s Erman Celiker share some insights gained from their partnership.

### Servicing

✓ Buying a product is only the first step. Problems can arise when it comes to keeping the product running. The client must have access to the best technical support along with swiftly delivered spare parts.

### Communication

✓ Suppliers must understand the needs of their clients in order to be able to anticipate possible issues and solve them quickly. This necessitates regular communication, both remotely and in person.

### Preparing for growth

✓ The requirements of successful enterprises will develop as they themselves expand. Suppliers must anticipate and meet these requirements through discussions and the introduction of improved products.

### Being solutions focused

✓ Issues inevitably arise in any enterprise. Tackling them successfully demands openness between supplier and client, as well as a focus on a common goal.

More [www.epiroc.com/support](http://www.epiroc.com/support)

# AROUND THE WORLD IN BRIEF



SHUTTERSTOCK

The increasing impact of EU regulations on nearly zero-energy buildings (NZEB) is one of the reasons why construction is so expensive in Geneva.

## Geneva is the world's most expensive city for construction

▶ **EUROPEAN CITIES ARE** generally the most expensive cities in the world for construction, occupying six of the places in the top ten. According to a report from the Netherlands-based consultant Arcadis, the most expensive city for construction work in 2021 is Geneva (Switzerland), followed by London (UK), Copenhagen (Denmark), Oslo (Norway) and Zurich (Switzerland). US cities New York and San Francisco occupy the next two spots, and Hong Kong (China),

Dublin (Ireland) and Macau (China) round out the top ten.

Geneva's rise to the top has been strongly driven by the appreciation of the Swiss franc and the increasing impact of EU regulations on nearly zero-energy buildings (NZEB) that Switzerland has adopted. US costs have dropped compared to 2020 due to the depreciation of the US dollar and the decline in construction demand and activity during the COVID-19 pandemic.

## Geothermal electricity project in Germany

▶ **AS REPORTED BY** International Construction, a ground-breaking geothermal project is underway in Bavaria, Germany. Four liquid-filled pipe networks placed in hot rocks 4500 meters beneath the surface will be heated to 120 degrees Celsius, providing energy for a surface power plant to generate up to 8 MW of electricity. The cost of the system is estimated at €200 million. Drilling will commence in 2022.



SHUTTERSTOCK



**Peter Harrop**

Chair of IDTechEx

## Mines providing energy storage

**In a recent report, IDTechEx proposes that mines should be used for energy storage and production. Can you tell us more?**

"The need for long-term energy storage solutions is rapidly rising as more solar and wind are going into the energy mix. There are a lot of solutions being developed, and many of them are actually closely related to mining and generate potential new income streams. For example, disused mine shafts can be used for gravity storage solutions by lifting loose rock up the shaft. Another potential solution is to fill underground caverns with compressed air that can be tapped as needed, and another is to heat sand or igneous rock to store energy for days or even weeks. As for production, the mining industry is already moving towards electrification, and the electricity will need to be produced by zero-emission solutions. Excess energy production can be sold to and stored for both local micro grids and national grids."

**How far along is this technology?**

"It is certainly feasible within the next few years, and we as analysts recommend that all mines should examine the possibilities. Mines can gradually make the transition to energy storage as reserves are depleted – you can both have your cake and eat it, too."

**More** [www.bit.do/IDTechExreport](http://www.bit.do/IDTechExreport)





# Pinpointed

## 1 Increased interest in deep sea mining Clarion Clipperton Zone, Pacific Ocean

➔ Interest in deep sea mining is on the rise, *mining.com* reports, with several contracted mining companies focused on the ore-laden Clarion Clipperton Zone (CCZ) between Hawaii and Mexico. Seabed minerals like manganese, copper, nickel and cobalt are often found in potato-sized polymetallic nodules formed by absorbing metals from the seawater around cores of bone, shell or rock. The nickel reserves in the CCZ alone are estimated at 270 million tons, 100 times the global annual production in 2019.

## 2 University of Arizona launches school of mining Tucson, AZ, USA

➔ The University of Arizona is starting a school of mining and mineral resources, *miningmagazine.com* reports, breaking down disciplinary silos to educate the next generation of engineers and professionals. It will offer undergraduate, graduate and professional training in areas such as data science, automation, AI, business, social sciences, safety, public health and law. Due to efforts to reduce carbon emissions, demand for copper is on the rise, and Arizona is the sixth-largest copper producer in the world.

## 3 Carbon-free "green steel" hits the market Luleå, Sweden

➔ As reported by *The Guardian*, the Swedish venture Hybrit has made the world's first customer delivery of "green steel." The first batch was delivered to truck-maker Volvo AB as a trial run, with full commercial production planned for 2026. Hybrit is replacing coking coal in steel production with renewable electricity and hydrogen. Another venture, H2 Green Steel, is aiming for production by 2024. Traditional steel production using coal accounts today for around eight percent of global greenhouse gas emissions.

## 4 Iconic diamond mine shuts operations Argyle Diamond Mine, WA, Australia

➔ The iconic **Argyle mine**, Australia's first large-scale diamond operation, has closed after 37 years of uninterrupted production, putting up for sale a final batch comprising 70 diamonds weighing 81.63 carats, including the **Argyle Eclipse**, a 3.47 carat Fancy

Intense Pink diamond. As reported by *mining.com*, Argyle became the source of about 90 percent of the world's prized rose-to-magenta hued stones. At its peak, Argyle churned out 40 percent of the world's collective diamond output.

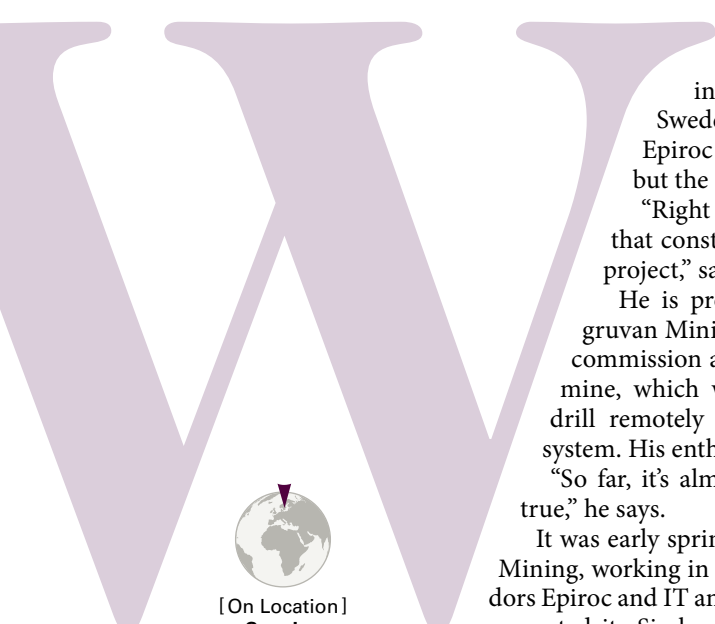


ARGYLE PINK DIAMONDS

SIMBA TELEREMOTE AND LTE  
OFF TO FLYING START

# NETWORK NEWS

»—> A safer and healthier working environment that delivers significantly more drilling hours. For Zinkgruvan Mining, drilling via SimbaTeleremote affords many benefits.



[On Location]  
Sweden

**WE FIND OURSELVES** 350 meters underground in the Zinkgruvan mine in Sweden. At the mine face, an Epiroc Simba E7 rig is drilling, but the cab is empty.

“Right now we’re in the area that constitutes stage 1 of 3 of the project,” says **Håkan Mann**.

He is project manager for Zinkgruvan Mining’s efforts to install and commission a 4G LTE network in the mine, which will enable operators to drill remotely via Epiroc’s Teleremote system. His enthusiasm is unmistakable.

“So far, it’s almost gone too well to be true,” he says.

It was early spring 2021 that Zinkgruvan Mining, working in conjunction with its vendors Epiroc and IT and telecom operator Telia, connected its Simba E7 rig to an LTE (Long

Term Evolution) network for the first time in an actual production area. Since then, remote production has taken off like a shot in the areas where the LTE network has been commissioned, although the drilling that takes place over the network is still considered to be a test and is not measured against any specific targets.

“So far we’ve drilled seven pallets remotely. It runs very smoothly, but as soon as something doesn’t work, I can call an Epiroc service engineer,” says operator **Jocke Lindblad**.

He monitors the rig from an above ground office, next to a window where daylight flows in and with colleagues who occasionally stick their heads round the door to exchange a few words.

“I like being down in the mine too, but it’s certainly safer and better for the body to sit here.



**Håkan Mann**  
Project Manager,  
Zinkgruvan Mining





The Epiroc Simba E7 rig is remotely controlled from an above-ground office. Zinkgruvan Mining's Håkan Mann and Mattias Dömstedt check that everything is working according to plan.

It's nice to be able to take a coffee break or a breath of fresh air when I feel like it," he says.

The fact that operators do not need to drive down into the mine, except when there's a problem or something needs servicing, and avoid having to stop what they are doing in order to accommodate breaks or shift changes, means that they can drill four hours more per day on average when drilling over Teleremote. In purely technical terms, controlling the rig from the office is not substantially different to controlling it from the cab; the screens and levers are identical to those on the rig.

"The only difference is that I can't hear the drill. But you do have to keep a closer watch on the measurement values on the display," says Lindblad.

**BUILDING A DEDICATED LTE network** has been a real challenge. According to Mann, it's much harder to design a mine below than above ground. →

## LEARN MORE // SIMBA TELEREMOTE

# In control – out of harm's way

THANKS TO CLEVER technology, such as an LTE network, an operator above ground can operate the Simba E7 rig in the mine.

Sitting comfortably and safe at the office, the operator controls and supervises the remotely operated Simba E7 down in the mine.



The data communication is made possible through the LTE network, which has been specified by Zinkgruvan. To allow for optimum and well distributed signal coverage, approximately **70 LTE Remote Radio Units (RRU)** are installed throughout the production area.

A combination of leaky feeder and passive coaxial cables and antennas are used to spread the wireless signals along the production areas. Each drill rig is fitted with an **antenna integrated radio (AIR)** module that enables the machine to communicate through the telecom network.

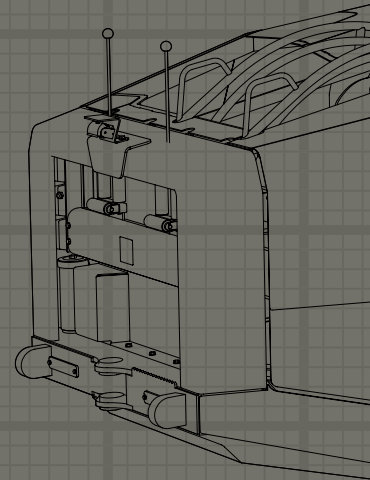




Operator Jocke Lindblad enjoys monitoring the rig from an above-ground office. The only downside is that he can't hear the drilling sound.

### Technical specifications

1. RCS 5 control system with intuitive graphics.
2. AIR LTE; Antenna Integrated Radio featuring a MIMO antenna and an LTE router/modem.
3. PTZ (Pan Tilt Zoom) cameras, which swing from transport position to working position with the aid of an electric motor.
4. Support jacks with level sensors so the operator knows when the jacks have been fully retrieved.



**Jocke Lindblad**  
Operator,  
Zinkgruvan Mining

“We chose 4G LTE because it’s a network that can evolve over time. It’s also safer to have a dedicated network,” he says.

There are a total of four Simba rigs in the mine. At time of writing, one of them is connected via Simba Teleremote. Zinkgruvan Mining is the first in the world to connect one of its Epiroc drill rigs to an LTE network, and the development work has been run in parallel with that undertaken by Epiroc.

“They’ve known that we’re going to build an LTE network and then developed their teleremote system in line with that,” says Mann.

**THE PROJECT IS** far from complete, but Mann is proud of what has been achieved so far. After completing 6 500 remotely drilled meters, he can confirm that the drilling is more efficient than ever, while the operators are satisfied and happy.

“The less time they spend in the mine, the better; both in terms of safety and health. And with both increased efficiency and a better working environment, it’s a win-win situation.”

The key to success, says Mann, is the collaboration between everyone involved, not least Epiroc.

“To succeed with something that has never been done before requires short decision-making paths and an extremely responsive way of working, where everyone, including our partners and suppliers, assumes responsibility and is fully committed. This is exactly how we are working on this project. It’s a bit of fun!” ×

## Lundin Mining

A Canadian company that operates a portfolio of five mines. In addition to the Zinkgruvan mine in Sweden, the company also operates the Candelia mine in Chile, the Chapada mine in Brazil, the Eagle Mine in the USA, and the Neves-Corvo mine in Portugal.

- Copper metal production accounts for 71 percent of Lundin Mining’s production.
- Approximately 4 200 employees.
- Sales after Q4 2020: USD 529.5 million.

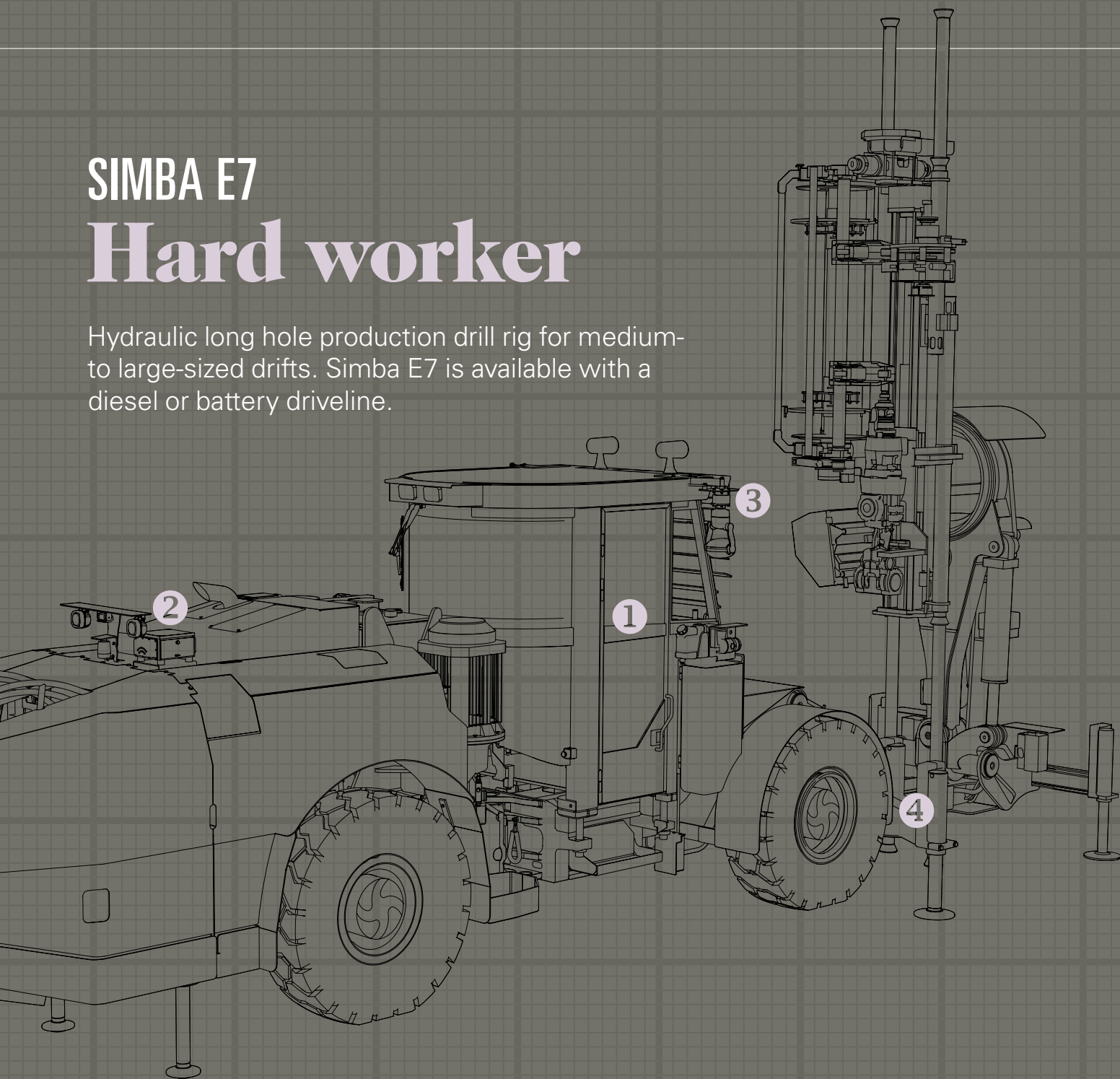
More [www.lundinmining.com](http://www.lundinmining.com)



# SIMBA E7

## Hard worker

Hydraulic long hole production drill rig for medium- to large-sized drifts. Simba E7 is available with a diesel or battery driveline.



## Zinkgruvan Mining

Operations at Zinkgruvan began in 1857. Zinkgruvan Mining is Sweden's southernmost underground mine, and the second-largest producer of zinc concentrates in the Nordic region, but also produces lead and copper concentrates at the site. Driving in the mine takes place underground at depths of between 350 and 1350 meters. Zinkgruvan is the first in the world to remotely control an Epiroc underground drill rig over a dedicated LTE network.

## Continuous drilling makes a big difference



### 4 extra drilling hours

This is how much time the Zinkgruvan mine makes up per 24h, as it can now continue to drill during shift changes and breaks.



### LTE via 4G

LTE stands for Long Term Evolution and is a standard for mobile broadband via 4G.



### Drill meters

6500 drill meters have now been drilled. The goal is 10000, after which a thorough evaluation will be carried out.



[Feature]  
**Change**



Security is a deeply rooted human need. We need it to feel good and be able to perform, both as individuals and in groups. But it is just as important to find new ways to do things. Without the ability to change, humankind would still be standing at square one.

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### ORIENTATION

#### To develop or not to develop

Sometimes leaving the comfort zone is necessary to avoid stagnating, but this requires a certain degree of courage.



### ON SITE

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Software specialist MineRP, which Epiroc acquired, enables mines to streamline operations and decision-making.

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#### The great comeback

The Lego Group was in a crisis as recently as in 2004, but today it has one of the world's strongest brands. Regaining control of production and introducing extensive intellectual property licensing helped turn the company around.

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#### Striving to create change

The digitalization wave turned the camera industry upside down. Fujifilm saw the change coming and chose to diversify its business while at the same time acknowledging – and developing – its deep competence.

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Today he is the head of the Catholic Church, but when Jorge Mario Bergoglio first entered the labor market, he had to work two jobs: as a janitor and a nightclub bouncer.

BJORN OBERG, JAMES OATWAY, SHUTTERSTOCK



# Blazing trails



It may be frightening, and we are not programmed for it – but change is generally the only way forward. The advantages can be enormous for companies and organizations that manage to get employees to buy into the benefits.

**D**evelopment, process, transition, reform... there are many words to describe change. If you look through a long enough lens, you see that change is the only thing we can be certain of, regardless of whether it is aging or the evolution of a species that is in focus. When it comes to human behavior, there are a number of parameters that influence how inclined we are to change. The instincts passed down through the generations are strong and must be overcome.

“The brain’s neural decision-making center is calibrated to refuse change by default,” says **Leif Denti**, PhD, Innovation Leadership and Management, Department of Psychology, at the University of Gothenburg, Sweden.

“Naturally, it is no coincidence. With change comes potential danger, so by being naturally skeptical to change, we increase our chances of survival.”

He continues:

“However, new ideas and change are what propel us forward, but before we are inclined to accept an idea, we need to test whether it will lead to a desirable outcome.”

Alongside his research, Denti has conducted innovation projects in large, international industrial companies and has discerned a pattern as to why it may be difficult for us to implement change.

“When introducing a change, too much attention is given to *what* the

change entails and too little to *why* it is being done. Distrust easily arises if management does not describe the background and explain what their discussions have been like in the board room. Initially, it is a matter of being transparent and devoting 80 percent of communications to describing the challenge and only 20 percent on what will happen. This increases understanding and makes people more inclined to change.”

In recent decades, change management has been a natural tool used by many management teams. The discipline has its roots in the US of the 1960s at a time when behavioral sciences merged with marketing, psychology and finance. The concept itself was coined at the beginning of the 90s, when it also made its major breakthrough.

“Many big corporations argued that ‘if the number one reason that projects fail is because of employees and their engagement, and their inability to change, then maybe it’s worth an investment,’” says **Tricia Emerson**, President and CEO of Emerson Human Capital Consulting.

She founded the Alameda, CA,



**Leif Denti**  
PhD, Innovation Leadership and Management



**Tricia Emerson**  
President and CEO, Emerson Human Capital Consulting

based company in 2001, and has written three books: *The Change Book*, *The Learning & Development Book*, and *The Technology Change Book*. Over the years, Emerson has witnessed both failure and success in her area of expertise.

“Companies often fail because of hubris,” she says. “They tend to believe that people will do things just because they are told, but that simply isn’t going to happen. A good idea might not be in the interest of the individual, so it’s hugely important to show why the current system doesn’t work.”

The change model developed by Emerson Human Capital Consulting maintains that every change needs the same four elements: strategy, internalization, focus and sustainability. Tricia Emerson stresses the importance of addressing human nature and of engineering a good experience.

“First impression is everything, so be thoughtful about who you are impacting. Convey the change based on their context and emphasize it relative to its importance to them. Also, focus on the positive people, and try to capture the innovators and early adopters. If you do that, and create momentum within 90 days, people will follow.”









# “Not only did we see a need to convert operations to renewables, but also an opportunity”

**Andreas Teir**  
Vice President of Nordic Sales, Neste



Being able to change at pace with the times and one’s surroundings is perhaps the single most important success factor for a company. Just ask Neste, founded in 1948 to secure Finland’s supply of oil. During the second half of the 20th century, the company grew and diversified, only to reach a crisis in the beginning of the new millennium.

“Oil prices crashed, our margins shrank, and the EU developed new climate targets. Not only did we see a need to convert operations to renewables, but also an opportunity,” says **Andreas Teir**, Neste’s Vice President of Nordic Sales, Renewable Road Transportation.

Innovation has always been part of the company’s DNA and renewable diesel, produced using NEXBTL technology, was the solution. Neste developed and patented the technology as early as in the mid-90s but had not yet commercialized it.

“The product existed, but there was not yet a specific market for it,” says Teir. “Our challenge was to introduce the name, but even more so to explain what it was to legislators and customers. It took close to ten years to be profitable, but now, renewables are extremely lucrative for Neste. In 2020, 94 percent of our total profits came from such products, and now, there is even



**Andreas Teir**  
Vice President of Nordic Sales, Neste

renewable jet fuel.”

The happy ending of this change journey is not only due to the fact that the product was right for its time, but also because it was successfully communicated externally. Teir also highlights the internal process, company culture and goal-oriented efforts.

“We prioritized doing a proper business analysis and understanding what we wanted to achieve,” he says. “Then it was a matter of being courageous and persevering. We don’t necessarily view failure as something negative but rather as an opportunity to learn. If you never fail, it might mean that you are ultimately not trying hard enough.” ✕

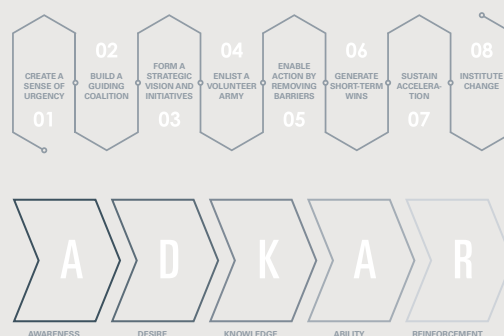
## CHANGE MANAGEMENT

### Two models in a vast field

**ACCORDING TO WIKIPEDIA**, change management is a collective term for all approaches to prepare, support, and help individuals, teams, and organizations realize organizational change. There are several models of change management, one of the most famous being John P. Kotter’s **8-Step Process for Leading Change**, which consists of the following stages: Create a Sense of Urgency, Build a Guiding Coalition, Form a Strategic Vision

and Initiatives, Enlist a Volunteer Army, Enable Action by Removing Barriers, Generate Short-Term Wins, Sustain Acceleration, and Institute Change.

Another often-used model is the **Prosci ADKAR Model**, an individual change framework created by Jeff Hiatt. ADKAR is an acronym formed by the five building blocks of successful change for an individual: Awareness, Desire, Knowledge, Ability, and Reinforcement.





[On Location]  
South Africa

# DRIVING CHANGE

»—> The key to adopting vital new technologies is understanding the value of change. Epiroc embraces this concept with its acquisition of a company that excels at finding smart solutions at the digital frontier of mining.

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## “Epiroc is venturing into completely new territory. That requires building specialities and capabilities”

**Kumeshan Naidu**  
Integration Manager, Mergers & Acquisitions,  
Technology and Digital division, Epiroc

**F**UNI RAMALALA ENTERS a small office park just two minutes’ walk from her home. The ground floor houses the nerve center of MineRP, a software company headquartered in Centurion, South Africa, that was bought by Epiroc. Her first order of business is a “stand-up” – a short check-in meeting with her team on the previous day’s events and today’s plans. Any glitches are ironed out. Next she gets down to business – developing a new product for mining clients.

Ramalala is a project manager at MineRP, a specialist software company that has engineered an open platform with 2.7 million lines of code for extracting, analyzing and integrating multiple layers of data from mines and turning them into live visual digital twins. This enables mines to streamline their operations and decision-making, thereby improving productivity. Its customers range from small, single-shaft operations to some of the world’s largest extractive multinationals.

Her job starts with identifying a client’s busi-

ness needs and formulating them into “user stories.” Next comes meetings with a software team to assess whether the requirements can feasibly be executed. This is followed by building test cases to ensure the product is competitive enough to enter the market. Feedback from customers is mostly positive. “I get told: ‘Where has this been all along? It cuts my job in half.’”

Ramalala studied geology at university, expecting to get her hands dirty in the mines. “I thought I would be working on site at the mines, not behind a screen,” she says with a broad smile. “But times are changing, and we must move with the times, especially when it comes to digitalization. I think the industry today calls for integration between all spheres.”

**THE ACQUISITION** of MineRP was a natural fit for Epiroc. When **Kumeshan Naidu** joined the company three years ago as Regional Application Center Manager, Technology and Digital division, he had already been introduced to MineRP through his work with digital and automation systems across Africa. He was impressed with their offerings. Last year he was about to formalize a joint project when Epiroc’s head office in Sweden alerted him that MineRP was for sale.



Project Manager Funi Ramalala identifies a client's needs, formulates "user stories," and then builds test cases to see if solutions are market-ready.



**Funi Ramalala**  
Project Manager,  
MineRP

"The two companies gravitated towards each other because Epiroc's digital strategy wholeheartedly believes in open and agnostic systems," explains Naidu. "Unlike many other OEMs, we believe in allowing data integration and automation in platform type systems, rather than paying for a proprietary system that locks in a customer. In building our technology portfolio, it was one of the most important points in choosing a potential acquisition target."



**Kumeshan Naidu**  
Integration Manager,  
Mergers & Acquisitions, Technology  
and Digital division,  
Epiroc

Investing in digitalization aligned perfectly with the next step in Epiroc's technology evolution, as more mines embark on electrification and automation. "It made sense to protect our core business, but expand it to give us more opportunities and revenue," explains Naidu.

Epiroc had already invested in Mobilaris, a software company based in Sweden that offers customers situational awareness through 3D digital visualization of the environment where machines operate, to optimize productivity, safety and efficiency.

"Then we said: what if we expand it to have a complete view of customers' mining value chain. That's where MineRP comes in," says Naidu. "They consolidate datasets on a mine site, bring them in, then organize and visualize the data so that customers can make decisions all the way from the production to milling environment, sales process and financial management."

With these acquisitions, Epiroc was venturing into "completely new territory". And that required building specialities and capabilities within the organisation.

**CHANGE MANAGEMENT** is one of **Marlise van Zyl's** specialty areas. As MineRP's Methodology and Implementation Director, her formal role is to "guide and govern" projects. This entails assigning resources, visiting mine sites to monitor implementation, and updating methodologies to be employed for current and future projects. But "change and adoption management – even organizational change management within our own company – lies close to my heart," she explained.

For Van Zyl, the key to success is mapping and tracking value, even in small increments. "I have a mantra that I tell people all the time: if you want people to adopt your software, to change from one way of doing things to another, you must have a well architected solution that delivers value," she says. "If the client understands what that value is, that ultimately is the element that drives the change."

Change must be well managed, too, for its effects to be sustainable. "You still have to facilitate the process of communication, training, and business process management," she says. "Flowing from that, is ensuring that the client takes ownership of their journey of transforming their organization, supported by technology."

## Q&A

**Mikael Ramström**  
Vice President – Digital Business, Technology & Digital division,  
Epiroc Örebro, Sweden



focused on machines, while MineRP has been focused on processes and how you digitalize all aspects of mining. Now we complement each other in a very good way."

- Q Why does Epiroc invest so heavily in digital solutions?
- A "Without a doubt, it is the future of mining. Looking ahead, automation and electrification, enabled by digitalization, are the most important areas to invest in. Without digitalization, these things would be very hard to do. If you are not in digitalization, you have to find someone that you can partner with. We want to be that someone. This area is developing into a core business of Epiroc's."
- Q What is most exciting about the capabilities of MineRP?
- A "These guys have so much knowledge and competence in the area of digitalization.

They have such a vast network and experience in so many other systems on the market. The main reason is that it's an open system. Their platform can connect and interface with other systems and share data between systems. We can't expect our customers to replace everything with a proprietary Epiroc solution. What's important to us is to be able to co-exist, to think like an open ecosystem. And that's exactly what MineRP does."

- Q What has the acquisition of MineRP brought to Epiroc?
- A "Epiroc and MineRP have been active in the mining industry for a very long time, but in two different areas. We have been
- Q How can using this expertise transform how mines operate?
- A "What MineRP has been doing is to take the islands of expertise and competence in a mine and connect them and their data so that you have the full picture. Then you can create a mining plan and execute it, with the full flow of data and information across all aspects of your mine, without which you aren't really in control. The platform that connects all these islands of expertise makes it possible to both plan and execute. Suddenly you know what you're doing in your operation and you can simulate what you want to do in the future."

More [www.minerp.com](http://www.minerp.com)





**“Times are changing, and we must move with the times, especially when it comes to digitalization”**

Funi Ramalala  
Project Manager, MineRP



This is also the key to remaining part of a customer's long-term digital journey. Clients are not only trained in how to use the software and left with operating manuals and videos – they are also provided with the skills to transform their operating model by breaking down silos between disciplines. In this process, having top-level mining expertise within MineRP is a crucial ingredient.

“We employ geologists, surveyors, mining engineers – all kinds of competencies you will find in a mining environment, from junior-level right up to former executives from the different mining companies, including CFOs and ex-VPs,” explains MineRP's Chief Technology Officer, **Anton van der Walt**. “How do you translate your technical system into ERP data in a financial plan without that type of knowledge?”

Van Zyl points out that having a broad mix of competencies – not just in mining, but also in software and business – is equally important. “We want a balance of people with software and mine-technical knowledge. We want a balance of people with many years of mining experience and people straight out of university that have fresh and exciting new ways of thinking. We want a balance of teachers and learners.”

This rich blend of expertise has now become part of the Epiroc offering to its clients.

**THE SPACE** Ramalala and her colleagues occupy is filled with large screens displaying revolving 3D visualization models. Rows of developers input code scripts for new products or spatial renderings. Others are constantly scribbling queries,

“I have a mantra: if you want people to adopt your software, you must have a well-architected solution that delivers value”

**Marlise van Zyl**  
Methodology and Implementation Director, MineRP

← Chief Technology Officer Anton van der Walt believes employing top-level mining expertise gives MineRP the edge in helping customers transform operations.

→ Methodology and Implementation Director Marlise van Zyl is passionate about organizational change and adoption management that deliver value.



**Marlise van Zyl**  
Methodology and Implementation Director, MineRP



**Anton van der Walt**  
Chief Technology Officer, MineRP

problems and suggestions on collaborative whiteboards. Cubicles are filled with team members remotely monitoring software installed on mines in different parts of the world, or resolving client queries. Presentations or strategy meetings take place in airy boardrooms just out of sight.

Sometimes entire teams and their supervisors decamp for weeks to the mines for hands-on installation, testing and training.

That was before the COVID-19 epidemic, which has drastically changed the way the company operates. MineRP has invested heavily in online and video collaboration tools so that projects and customer support can continue remotely. Stand-ups are still held every day, but now they are done using Microsoft Teams. Virtual whiteboards have replaced their real counterparts. For now, only essential workers report to the office, and mine visits are rare.

Adapting to the pandemic has been challenging, but absorbing change is in the company's DNA.





**Derek du Preez**  
Chief Technical Officer, Trevali

## How do you enable digital integration?

### Why did Trevali choose to partner with MineRP in particular?

“For us, it started with the need to integrate not just our technical systems for the mine but also our maintenance supply chain and human resource management systems to enable an integrated view – and to resolve conflicts between the various disciplines. That’s what MineRP has done with its platform. The reason we chose MineRP over other platforms was its experience in the mining industry and its willingness to get its hands dirty and form a real partnership, not just a commercial arrangement.”

### What changes and improvements has this led to in your operations?

“Initially, our aim was to improve quality tons to the mill – at the right specification, with the lowest dilution, and without too much variation. By leveraging the MineRP 4.0 platform, we’ve seen a significant reduction in unplanned dilution and a more consistent feed grade to the mill. This has helped us to increase and stabilize mill throughput with a fairly consistent grade, which delivers an increase in revenue because we are producing more metal. The new processes required our staff to do things differently, and we had to create new roles to support the new working methods. Ultimately, you need to bring individuals on the journey.”

### What future benefits does Trevali expect from this partnership?

“Epiroc also supplies us with equipment. As we start looking at our Rosh Pinah expansion project in Namibia, we are adding more of the Epiroc fleet. We will combine the Epiroc digital solutions with the MineRP platform to further improve productivity and unlock more value.” ✕

More [www.trevali.com](http://www.trevali.com)

## MineRP

- Founded in 1997 in Centurion, South Africa, spun out of the mining technical systems data division of a major mining company
- Focuses on digital transformation in the mining industry with a specialized data integration platform that is vendor and OEM independent
- Has offices in South Africa, Australia, Canada and Chile

So far the transition has been seamless, with no loss in productivity, although many miss hands-on interaction with clients, or the comfortable social vibe in Centurion. “We used to catch up for coffee,” says Ramalala. “Now we do video check-ins.”

**PLANS FOR** the future will focus on adding expert solutions and systems to the platform and reducing the time it takes for customers to reap the benefits of implementing any piece of software by creating pre-configurations for different mining methods.

Allowing capabilities within software to be switched on and off is also becoming increasingly important for customers. “They want to address problem sets as they arise, hone in on certain things and focus on that,” explains Naidu. “Now we need to make the data integration platform more intuitive and accessible to all types of mining customers.” ✕

# PERSPECTIVE LEGO

There are always things to be learned from other organizations and other industries. This is how another player has approached the theme of this issue.

☑ Christian Tarras Ericsson  
📷 Shutterstock

## Lego Group stronger than ever

# Versatile bricks

**WHAT IS TODAY** known as The Lego Group started out in 1916 as a simple family-owned woodworking shop in Billund, Denmark. During its first few decades, the company reinvented itself several times due to warehouse fires, the Great Depression and World War II, going from furniture and houses to wooden toys, plastic toys, and, eventually, studded interlocking plastic toy bricks in 1949.

In 1955, the company decided to develop a toy system based on the bricks, and in 1958 the basic brick design received its final tweak when hollow tubes were added to the underside, enabling much better locking ability and enhanced versatility.

Over the decades that followed, the Lego brick system was steadily expand-

ed to incorporate wheels, trains, boats, furniture pieces, posable minifigures and technical sets with gears, cogs, axles and joints. The first Legoland theme park was opened in Billund in 1968, followed by others. Themed sets were also introduced, ranging from pirates and knights to modern cities and futuristic space settings.

**BEGINNING IN THE '90S**, the company saw a decline in sales and profits. The first year with a loss was 1998, and the company hit rock bottom in 2004. Some of the reasons for the decline were a loss of focus on the main business, outsourced manufacturing, and the loss of creative talent.

A new non-family CEO was appointed, who proceeded to sell the theme

parks and take back control of production. The number of different Lego bricks being manufactured had grown, necessitating a large number of molds. This number was streamlined to around 6 000 different molds. The company licensed a number of intellectual properties, beginning with *Star Wars* and then followed by *Harry Potter*, *Marvel*, *DC* and *Nintendo*, among others.

Today, the Lego Group is stronger than ever. In 2015 the Lego Group overtook *Ferrari* and became the world's most powerful brand. Lego has also done well in the movie industry, and bonds with hardcore Lego fans have been strengthened through *Lego Ideas*, where fan-made set designs can become full-blown products. ✕



In 2015, the Lego Group overtook Ferrari and became the world's most powerful brand.

## In Focus: The Lego Group

After its humble beginnings a century ago and rapid decline during the '90s and the beginning of the '00s, the Lego Group is today stronger than ever. It has more than 20000 employees and reported a revenue of USD 6.9 billion in 2020 – up 13 percent from 2019 – with an operating profit of just over USD 2 billion.

The name Lego was established in 1934 and is a play on the Danish words *leg godt* (meaning play well). As a side note, the minifigures on the planet currently outnumber its human inhabitants.

More [www.bit.do/legofacts](http://www.bit.do/legofacts)

# SURVEY

## A CLOSER LOOK AT CHANGE

Want more input on this theme? Three people from different fields give their views to help paint a broader picture.

☑ Gustaf Höök

01

What's key when driving change?

02

Can you share an example of successful change?



**Toshi Iida**

President,  
Fujifilm Europe GmbH,  
Germany

**01** "QUICKLY ADAPTING to change is vital, and so is predicting change. Instead of having change just 'happen' to your corporation, you can take drastic change initiatives early, like pursuing new business fields and investing there. Fujifilm is currently striving to become a corporation that can create change."

**02** "FUJIFILM'S BUSINESS has been through significant change in the past 30 years, including the rapid decline of the photographic film market, digitalization and repeated natural disasters. However, we have overcome difficulties by diversifying our business while utilizing our assets such as various unique technologies cultivated over many years, corporate culture, brand, and financial strength. Our goal is to empower the potential and expand the horizons of tomorrow's businesses and lifestyles."



**Mary Uhl-Bien**

Endowed Professor of  
Leadership, Neeley School  
of Business, TCU, USA

**01** "UNDERSTANDING THAT other people have a different perspective than you – their needs are not your needs. Don't base your change effort on what you want or believe. Instead, find out about others' situations and then try to link up with their needs. The only way we can do this is by listening, engaging, questioning, and connecting."

**02** "CAPITAL ONE'S Brian Alink's efforts to drive digital transformation. Brian did exactly what I just described. He learned that when he was facing what we classically call resistance, he needed to step back and 'get curious' by asking deep and probing questions of himself and others. By doing this he found pathways for connecting across differences. Brian is savvy in sensing timing and picking his battles. When given a choice, he picks problems with the strongest likelihood of generating a solution and the greatest potential benefit for the organization."



**Rune Todnem By**

Professor of Leadership,  
University of Stavanger,  
Norway

**01** "FOCUS ON WHAT matters: organizational purpose-beyond-profit informing core values, which in turn inform and guide decision-making. We need to move away from the simplistic and limiting understanding that leadership is about the relationship between formal leaders, followers and delivery on 'shared' goals, and rather explore and embrace an understanding of leadership as the production of purpose, alignment and commitment. You may also want to consider going EPICally MAD, as explained in my TEDx talk (link below)."

**02** "WELL, WHAT IS change and what does success look like? Today, successful change comes down to delivering on efficiency gains and other targets, but these targets themselves are often short-term and potentially detrimental. Short-term targets and measurements have become ends in themselves, often harming the organization. So, let's redefine change and success in line with my previous answer."

[More](http://www.bit.do/TEDxStavanger) [www.bit.do/TEDxStavanger](http://www.bit.do/TEDxStavanger)



**“There is change in all things,”**  
Marcus Aurelius once stated. Not least in careers.  
Here is a list of prominent individuals who switched  
professions radically.

07

**Pope Francis**

Bouncer → Pope

Starting out working double shifts as a janitor and a Buenos Aires night-club bouncer, Francis followed his calling to the priesthood at age 22 and entered the Jesuits. He rose rapidly through the ranks to bishop, archbishop, and cardinal, and was ultimately named supreme pontiff in 2013.



01

**Julia Child**

Secret Agent → Cooking Legend

As an intelligence operative for OSS during WW2, top-secret researcher Child was responsible for cooking up effective shark repellents. After marrying husband Paul and settling in Paris, she mastered the art of French cuisine and brought it to the American public.



06

**Whoopi Goldberg**

Funeral Makeup Artist → Actor

Née Caryn Elaine Johnson, Whoopi worked odd jobs, including as a bank teller, a bricklayer and a mortuary cosmetologist. She joined an avant-garde theater troupe and adopted her stage name. She is one of the few performers who has won a Grammy, an Emmy, a Tony and an Academy Award.



02

**Charles Bronson**

Miner → Actor

Born Charles Buchinsky to a family of Lithuanian descent, Bronson worked as a miner in his native Pennsylvania. After WW2 he took up acting, eventually landing roles in films like *The Magnificent Seven*, *The Dirty Dozen*, *Once Upon a Time in the West*, and *Death Wish*.



05

**Vera Wang**

Figure Skater → Fashion Star

Wang began figure skating at the age of eight, and she competed in the 1968 US Championships. When she failed to make the Olympic team, she quit to enter the fashion industry. She has designed wedding gowns for Mariah Carey, Alicia Keys, Victoria Beckham, and two Kardashians.

04

**Alexandria Ocasio-Cortez**

Waitress → Congresswoman

After college, AOC worked as a New York taqueria bartender and waitress to help her mother financially. An avid fighter of social injustices, she began running her congressional campaign from her place of work. She is the youngest woman ever to serve in Congress.



03

**Awkwafina**

Publicity Assistant → Comedian

Majoring in journalism and working as a publicity assistant, Nora Lum had a secret life as a Youtuber under the stage name Awkwafina. After publishing a rap video called *My Vag*, she was recognized and fired from her job. She then took up comedy, rapping and acting full-time.



Next issue  
[Feature]

Society relies heavily upon our ability to create physical structures to lodge us, transport us and to provide us with goods and provisions. Read more about construction in next issue's Feature.

# MY WORK: ENGINEERING SUPERVISOR

Epiroc's greatest asset is our employees. We take pride in offering them an outlet for their creativity in order to provide the best possible value to our customers.

☑ Frida Valentin  
📷 Sebron Snyder

## “I love solving problems”

»→ **Angelique LaFontaine** has always been interested in math, science, and large equipment. Today, she loves solving problems in heavy machinery in the role as Manufacturing Engineering Supervisor in Garland, Texas.

“**M**y parents gave me an old-fashioned typewriter when I was a child. I started to write poetry and then continued with science fiction. My early passion for painting is also an example of my creative side. But it was my great interest in math and science that paved the way for my career choice. Instead, I write and paint on the weekends, when I'm not camping or trail-running. Here in Texas, I earned a Bachelor of Science degree in mechanical engineering. My first job at Navistar got me into the heavy equipment of engineering, with focus on designing. I have always been fascinated by large equipment.

**IN 2010, I WAS** lucky to get a job at Epiroc; first as a design engineer and then in a LEAN project focused on improving safety and efficiency in the production. Together with two colleagues, I gathered data on the floor and then developed a process for the implementation.



**ANGELIQUE LAFONTAINE**

**Age:** 41  
**Job:** Manufacturing Engineering Supervisor, Garland, Texas  
**Joined the company:** 2010  
**Best part of the job:** “Every day presents a new opportunity to provide solutions.”

I was also involved in the design for a lot of the digitalized and automated equipment, for example our revolutionary Rig Mover machine that's related to the initiative Live Work Elimination. The machine's lifting and lowering capabilities allow the assembler to work safely, both under and on top of the drilling rig, which is also much more ergonomic.

**TODAY, I ENJOY** my role as a Manufacturing Engineering Supervisor. The daily challenges are what make it fun. It's rewarding to find a problem, solve it and then implement it to improve a process. I love solving problems. A typical day may include dealing with issues on the production floor or on the test pad, understanding what our core problems are, and initiating data-driven projects. My strengths are that I understand the overall picture and that good processes come from collaborative discussion. Everyone has a voice that needs to be valued when it comes to improving processes.” ×





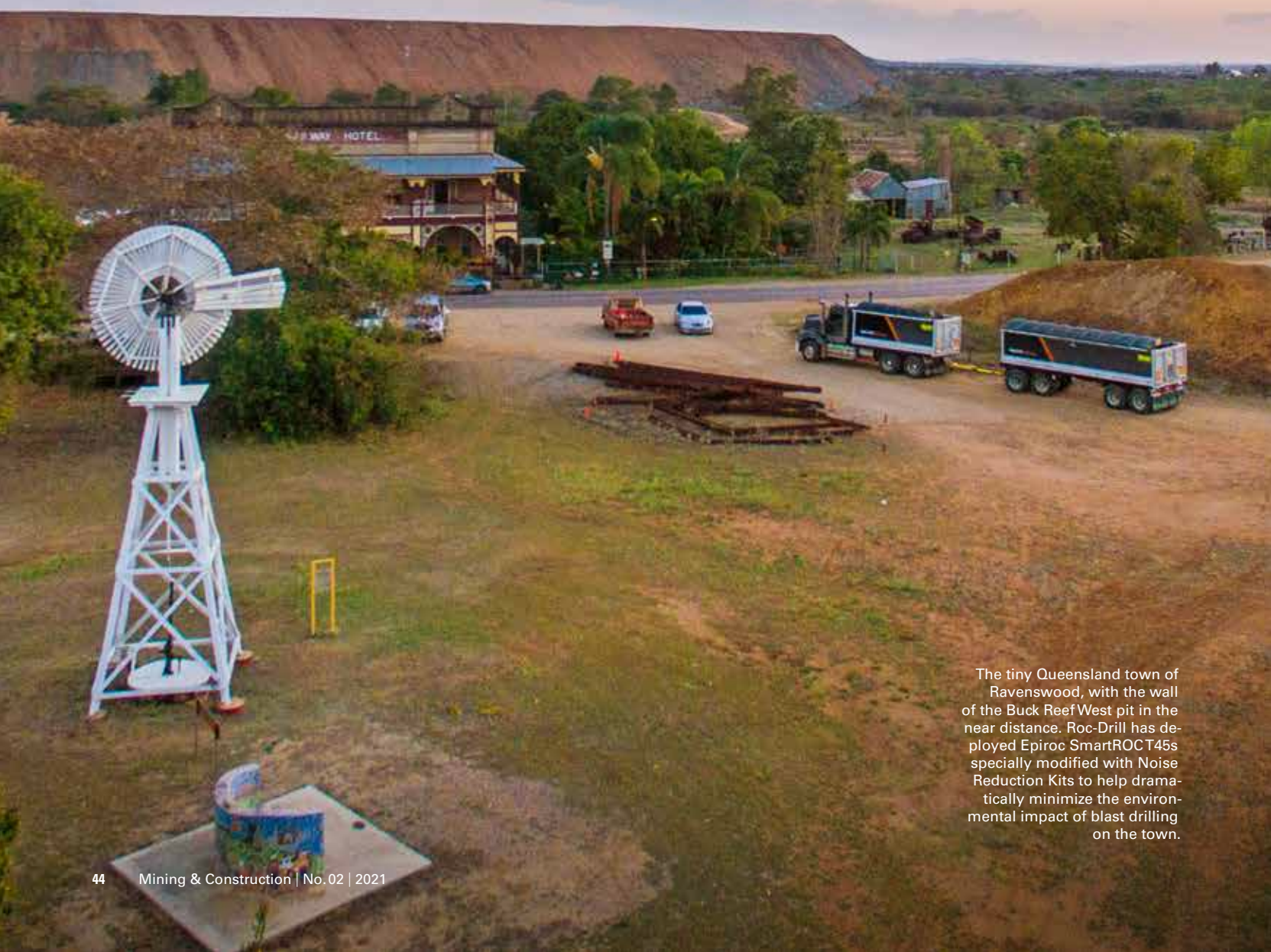
Angelique LaFontaine enjoys the daily challenges as a manufacturing engineering supervisor in Garland, Texas. Problem-solving is one of her fortes.



[On Location]  
Australia

# SILENT RUNNING

»»» → Blast drilling only meters from civilian towns is now easier, thanks to a unique Epiroc solution developed for Roc-Drill, a long-standing Australian customer.



The tiny Queensland town of Ravenswood, with the wall of the Buck Reef West pit in the near distance. Roc-Drill has deployed Epiroc SmartROCT45s specially modified with Noise Reduction Kits to help dramatically minimize the environmental impact of blast drilling on the town.



→  
SmartROC T45, with its distinctive noise reduction kit, at the Buck Reef West pit.

1

## THE CHALLENGE

**T**HERE ARE mining towns, and then there's Ravenswood. This tiny hamlet 150 kilometers inland from Australia's north-east coast has been a center for gold exploration since 1868.

Back then, it was panning and sluicing for alluvial gold.

These days, it's the gaping Buck Reef West open pit, 500 meters long, which operates 24 hours a day just 200 meters from Ravenswood's beautiful heritage pubs, post office and school buildings.

Mining here comes with strict environmental constraints, so when Roc-



**Stewart Prince**  
Regional Manager,  
Epiroc

Drill, an Australian leader in open drilling and a long-standing customer of Epiroc, tendered for the contract at the new pit, it knew it would need to utilize rigs with noise-reduction technology.

"We don't work with very many noise-reduced drills

in northern Australia because you just don't need them," says **Stewart Prince**, Epiroc regional manager for Mount Isa and Townsville. "You're in an environment where it doesn't matter. But obviously it matters in Ravenswood. They're mining so close to town."

2

## THE SOLUTION

**R**OC-DRILL DIVERTED three Epiroc SmartROC T40 rigs with Noise Reduction Kit originally destined for New Zealand to start work in the new pit. But going forward, it needed to source a higher capacity drill with the same noise suppression capabilities.

Epiroc stepped up to the plate. Account Manager for Eastern Australia David Green liaised with Roc-Drill while Business Line Manager for the Australian Surface division Craig Marsh worked with Epiroc's Product Company in Örebro, Sweden, to develop a solution that took the boom assembly and Noise Reduction Kit typical of a SmartROC T40 and fitted it onto a larger SmartROC T45 carrier.

The new rig would have a higher capacity with a 250-kilowatt engine versus a 168-kilowatt engine and a 223

liters-per-second compressor versus a 153 liters-per-second compressor, but with the relatively lightweight, hydraulically powered Noise Reduction Kit of the T40, which slashes the noise of drilling and rod changes by a game-changing 10 decibels.

"Craig worked with the factory [in Örebro, Sweden] to take the kit from the SmartROC T40 and fit it to the bigger frame of the SmartROC T45, so it's got more air, more horsepower," Prince says.

Epiroc has a long history of developing tailored solutions for its customers, but creating a hybrid machine in today's stricter regulatory environment is no easy feat.

"Something like this is very challenging," Prince says. "You need to be able to support the machines with operational manuals, parts books and software, so there are a lot of flow-on effects."



3

## THE RESULT

**T**HE FIRST TWO SmartRoc T45 rigs shipped from Örebro in February 2021 and were onsite by May. The difference between a stock rig and the same unit with the Noise Reduction Kit is enormous.

"It makes a huge difference," Prince says. "Particularly at night when it's still. That's when you can tell the difference from an un-noise-restricted rig."

The Noise Reduction Kit's hydraulically operated aluminum doors come with other advantages, such as limiting the environmental impact in the event of a consumables spill. And the operator of a noise-reduced rig can simply turn the boom horizontal and open the kit's doors for easy equipment maintenance.

"Nigel de Veth, Roc-Drill's CEO, has had this idea on how to mine this pit in the best possible way," Prince says. "And that application is being considered in other mine sites where you have open-cut mining happening very close to town."

As resources are becoming harder to find, mining is happening closer to towns. So, you have to come up with different and better solutions." ✕

**More** [www.bit.do/ravenswoodfacts](http://www.bit.do/ravenswoodfacts)



LIVE WORK ELIMINATION

# Linking safety and productivity

No work-related injuries – that’s an Epiroc goal post-2030. One of the means to get there is the Live Work Elimination program.

**S**afety is at the heart of Epiroc’s innovation strategy and also an integrated part of the company’s 2030 sustainability targets. On safety and health, the vision is to have zero work-related injuries, and the Live Work Elimination (LWE) program contributes to Epiroc’s efforts to reach this goal.

“Live work can have an extremely broad

definition, so we got a cross-functional team together and asked ‘how are we going to define it, so we can do something about it?’, says **Lori-Anne Fleming**, Live Work Elimination Program Manager.

“The general definition is pretty much anything around energy, but for us it’s a task – an actual thing one has to do on a piece of equipment – because that’s what we can change. How to work on our equipment.

And the equipment has to be either energized or unisolated, so that’s the energy force – that it’s live.”

**THE LWE PROGRAM** began in May 2021 and started by identifying live work in all of Epiroc’s standard operating procedures. That work was completed ahead of schedule. The focus has now switched to eliminating hazards using technology.

**IN FOCUS**  
LIVE WORK ELIMINATION

**Hydraulic Operated Bit Basket**

Epiroc’s solution to improve safety when manually handling drill bits on deck. The Hydraulic Operated Bit Basket provides a solution for removing an operator from the “line of fire” risk when changing a drill bit on deck.

**SmartROC adjustments**

The SmartROC D65 and SmartROCT45 drill rigs have been modified so the operator can make more adjustments – such as pump pressure monitoring and feed speed adjustment – without leaving the operator’s cabin.

**Boomer M20 adjustments**

The Boomer M20 face drill rig has been equipped with – among other things – drill stop sensors that stop the rig if someone passes the boom console and enters the drilling area.

**Digital safety solutions**

Epiroc Mobilaris has developed digital solutions: Efficient evacuations (shortening the evacuation time by 25–50%), Safe underground traffic (advance warning of potential collisions) and Smart alerts.

**Unified spatial risk management**

MineRP has developed combined risk and production information, enabling the identification of emerging risks as work proceeds, and workflow engine for process automation and escalation of non-compliance.





Epiroc has selected nine relevant UN Sustainability Development Goals and connected them to the company's own goals. We highlight one goal in each issue.

### SDG 13: Climate action

“We expect suppliers to share our goals”

»→ The global Sustainable Development Goals (SDG) formulated by the UN are also guiding our sustainability work. We take a closer look at how Epiroc approaches Goal 13.



**Lori-Anne Fleming**  
Live Work Elimination  
Program Manager,  
Epiroc

“We have automation programs to keep people away from operating equipment in dangerous environments. To further the safety work, we are asking ourselves how we also can either automate, digitalize

or remotely monitor the maintenance. We are really linking safety and productivity, making both stronger by joining them,” says Fleming.

Before the actual start of the LWE program, Epiroc began working with the Safe-Start® training program to raise our behavioral awareness – how we’re aware of putting ourselves in the line of fire. The plan is to have it fully implemented by the end of 2022. This action and other efforts have raised the bar, and Epiroc now aims to tie the LWE program into every aspect of the company.

“Quite simply, we want to make sure that when people work on our equipment, they are not exposed to any energy that would put them in harm’s way and cause injury,” concludes Fleming. ✕

**SDG GOAL 13 – Take urgent action to combat climate change and its impacts** – is a goal that ties in nicely with Epiroc’s values and business operations. There are two very strong reasons why the group aims to halve CO<sub>2</sub> emissions by 2030.

“The world is facing a climate crisis, and as any good corporate citizen, Epiroc wants to act on the Paris Agreement. Furthermore, our stakeholders expect us to take action. Not just customers and investors, but also employees and society at large,” says Vice President SHEQ Joakim von Bothmer.

Epiroc aims to halve CO<sub>2</sub> emissions not only in its own operations, but in the entire value chain, including transports, in the use phase of the products it pro-

vides to the market and for key suppliers. The Group will work closely with suppliers, initially with those causing the most emissions.

“We will work together, expecting them to share our goals,” says Joakim von Bothmer.

As for transports, Epiroc is streamlining the supply chain as well as prioritizing deliveries by sea over those made by air. The review of energy consumption and greenhouse gas emissions represents another effort to improve internal operations.

“We are installing solar panels and purchasing renewable energy where applicable, and we are also implementing more energy-efficient solutions in manufacturing and facilities,” says Joakim von Bothmer. ✕

**More** [www.epirocgroup.com/un-sustainable-goals](http://www.epirocgroup.com/un-sustainable-goals)

# BLAST FROM THE PAST

## YEAR 2004

Innovative products and a wide array of customers: Epiroc is a new company with a long and rich history, dating all the way back to 1873. In each issue of Mining & Construction, we take a glimpse in the rearview mirror.

☑ Gustaf Höök  
📷 Shutterstock

Muslim pilgrims from all around the World revolve around the Kaaba in Makkah, Saudi Arabia.



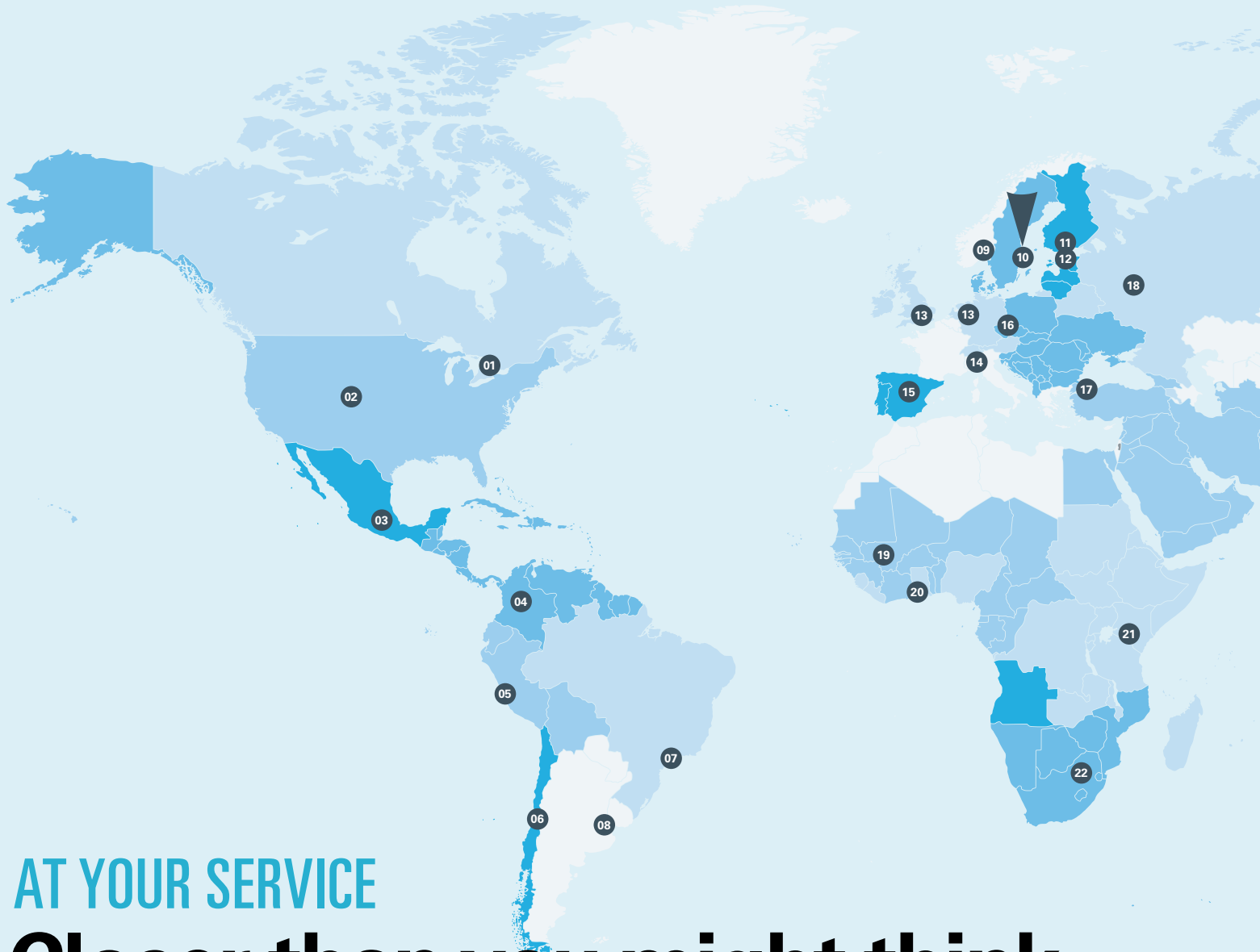


## Portfolio: Makkah motorway tunnels

**EACH YEAR**, millions of Muslims embark on the *hajj*, a pilgrimage to Kaaba – the House of God – in the city of Makkah in Saudi Arabia. Traffic is intense, prompting Saudi authorities already in 1972 to draw up a master plan to improve the infrastructure of the entire pilgrimage area. For the hajj in 2005, the authorities commissioned the construction of four motorway tunnels totaling 2 930 meters to transport people to and from the nearby area of Mina, where pilgrims stay overnight and later return to perform the stoning-of-the-wall ritual.

The project was completed in mid-December 2004, in no small part thanks to Rocket Boomer drill rigs from Atlas Copco (which, at the time, Epiroc was a part of). They were ordered by Turkish contractors STFA and Sargin Ekol Asdem, and a total of seven rigs were delivered by air to the worksites using the world's then-largest air freighter, the Russian Antonov 124. The advanced control systems installed on four of the drill rigs played a key role during operations in Makkah. For example, the drill plan for each face included more than 100 drill holes, and the automated sequences made it possible to minimize the boom positioning time.

**More** [www.bit.do/hajjfacts](http://www.bit.do/hajjfacts)



# AT YOUR SERVICE

## Closer than you might think

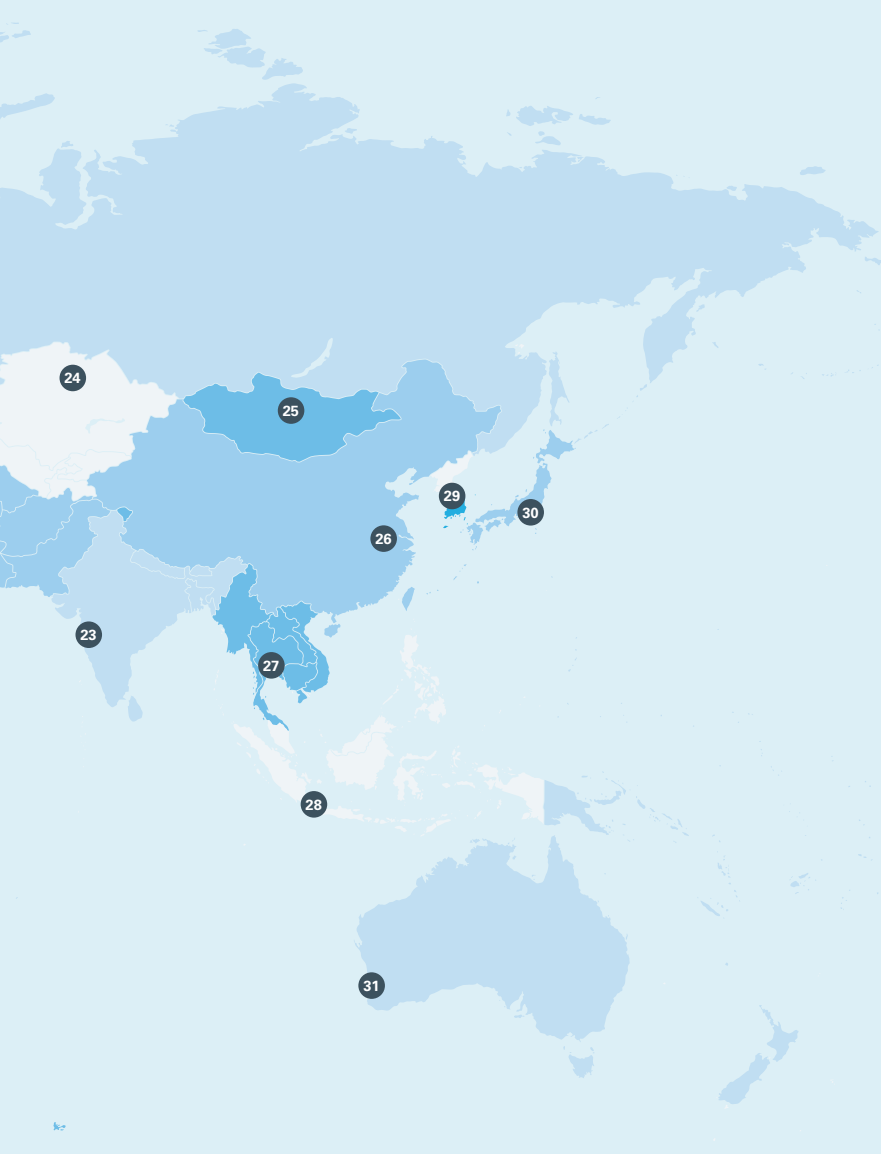
**OUR CUSTOMERS ARE** located all over the world and so are we. There is always an Epiroc office to turn to, making us truly local. At the same time, we are a global enterprise with worldwide resources. We have Customer

Centers in 32 regions. In each one, there are one or more Service Centers.

All this supports our goal: Count on us to listen, collaborate and deliver the right solutions for you.

01 Canada Toronto	07 Brazil São Paulo	13 Europe West Essen/Hemel Hempstead	18 Russia Moscow
02 USA Denver	08 Argentina Buenos Aires	14 Southern Europe & Northern Africa Milan	19 Mali & Burkina Faso Bamako
03 Mexico Mexico City	09 Norway Oslo	15 Iberia Madrid	20 Ghana Obuasi
04 CVCA Bogota	10 Sweden Stockholm	16 Central Europe Prague	21 Eastern Africa Nairobi
05 Andes Lima	11 Finland Helsinki	17 Turkey & Middle East Istanbul	22 Southern Africa Johannesburg
06 Chile Santiago	12 Estonia Tallinn		23 India Pune





24 Central Asia  
Nur-Sultan

25 Mongolia  
Ulaanbaatar

26 Greater China  
Nanjing

27 Southeast Asia  
(North)  
Bangkok

28 Southeast Asia  
(South)  
Jakarta

29 South Korea  
Seoul

30 Japan  
Yokohama

31 Australia  
Perth

Find Epiroc  
in your country:

[www.epiroc.com](http://www.epiroc.com)



[In focus]  
**Örebro, Sweden**

## Hello there! What's happening in Sweden?



**Thomas Hallmén**  
General Manager,  
Epiroc Surface  
division, Product  
Company Örebro,  
Sweden

**IN 2014**, the growth project Brownfield was created when two Epiroc divisions merged. The goal was for the Swedish surface operations to develop machines for the future under the same roof. In June 2021, a new modern office was opened, and in the summer of 2022, the production hall in the same

building will be opened. **Thomas Hallmén**, General Manager, is thrilled with this first important milestone.

### *How does it feel to be up and running in the new office?*

“It feels fantastic. Now we don’t have to sit in the temporary office cabins. Instead, we can work more efficiently together under the same roof. It means less transportation of staff and materials, a more flexible operation overall and, above all, a safer and more pleasant working environment.”

### *What benefits do you want to highlight?*

“Efficiency and safety. We have a greater opportunity to develop quality machines that contribute to our customers’ success and that are safer for both us and our customers. Product development can work more efficiently across functions with customer focus, to design products that are fit for the market and that drive technology forward.”

### *What can your customers look forward to?*

“Since we have combined our competencies and have a better overall knowledge of our customers’ needs, we can develop even better products and drive the market towards automation, digitalization and sustainability. Now we have the prerequisites to continue our successful journey together with our customers.” ✕

# One station for all needs

»»» Thanks to the Common Automation Panel (CAP), a mixed fleet of Pit Viper and SmartROC D65 drill rigs can be operated simultaneously. Product Owner Automation **Mayya Popova** elaborates on the upcoming solution.

**W**hat customer challenges are you solving with CAP?  
 “Having spoken to our business partners about their remote operations, we took the approach that many car manufacturers take with the electric cars: designing something from the ground up, not merely adapting an existing product. CAP is not just a copy of a cabin environment but rather a solution designed for the innovation transformation that we want to bring into the control room. Going back to the challenge, CAP will help our customers streamline the value chain of surface drilling operations, creating a safer and more productive environment.”

*So, what is CAP, then?*

“It’s a single station that allows mining customers to operate a mixed fleet of Pit Viper and



**Mayya Popova**  
 Product Owner  
 Automation,  
 Epiroc

SmartROC D65 MK II drill rigs. With CAP, the operator can make decisions without technical constraints. Since the station has the same display and joystick for both rigs, it will benefit not only operations but training as well.”

*What challenges did you face during development?*

“Considering that CAP had to support two different drill rig types and work with the compatible version of the software of the specific drill rig that is selected for allocation, the technical aspect was quite complex. It was a bit of a challenge, but also very exciting to figure out how to make it work.” ✕

## CAP in brief

- New design approach with two joysticks and a 12” touch display.
- Designed for a modern remote-control environment with a smaller footprint.
- New safety system to further improve the office footprint.
- Unified approach to operators’ training.
- Reduced inventory of replacement components and spare parts.
- Improved ergonomics to meet various human dimensions.
- Multiple display positions for better operator comfort.

More [www.epiroc.com/automation-and-information-management](http://www.epiroc.com/automation-and-information-management)