VOLVO CONSTRUCTION EQUIPMENT MAGAZINE

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spirit

RENTAL REVOLUTION
Plant pioneers

SITE SIMULATION
Playing a pivotal role

FROZEN ASSETS
Building with ice

Operator Leif Andersson helped develop the Volvo Co-Pilot

Photograph: © Gustav Mårtensson

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A welcome change for the better

Customers want cleaner, cheaper and safer machines, as do we all. They are better for business, economies and society – not to mention kinder to the planet our children will inherit. Of course, creating these new wonder machines isn't easy, but thanks to advances in engineering, automation and electrification Volvo is at the vanguard of this new paradigm – and pursuing the vision with characteristic passion and vigor.

But don't just take my word for it; this issue is filled with stories about how Volvo CE is turning this dream into reality. Design guru Sidney Levy talks to us about how the search for innovative solutions requires collaboration from all sorts of partners – customers, governments and academics. The latest of these new ideas and truly revolutionary prototypes were unveiled at the recent Xploration Forum.

While we strive to get things right first time, everything can always be improved. And here too the voice of the customer is important. Our article highlighting the use of the Volvo Co-Pilot tablet and its Load Assist app on machines in a quarry in Sweden is a good example of how new technology can be refined in cooperation with users.

It's not just new machines that are needed, but new approaches to using them. With every second construction machine in the world now rented, according to Barbara Hoffman, managing director of Baumaschinen-Hoffmann, this allows her to offer customers the opportunity to rent its fleet of Volvo machines not just by the day, but by the hour.

This focus for building better machines is being noticed, as you'll read in this issue. Already respected for our fuel-efficient machines, few endorsements demonstrate Volvo's environmental consciousness as much as the decision by Sweden's famous Icehotel to use our machines to construct the building they hope will eventually become carbon negative.

The diverse content in this magazine, plus the bonus of exclusive video, can be viewed on the free digital version of ***Spirit***. Video is available on the ***Spirit*** website, too, where our international audience can also access back copies in 12 languages.

TIFFANY CHENG
Global Director
External Communications
Volvo Construction Equipment

IN THIS ISSUE

ON THE COVER

Volvo machines are used to build Sweden's famous Icehotel: photograph by Marcel Pabst www.icehotel.com

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FROZEN ASSETS

Things are hotting up at Sweden's coolest holiday venue

by Erik Skoglund / photographs by Asaf Kliger and Marcel Pabst

The Icehotel boasts 300 beds

This picture and below: some rooms feature exclusive snow sculptures

By hosting the famous Icehotel, the tiny village of Jukkasjärvi in the far north of Sweden has really lived up to the words of the Swedish national anthem: "When honoured Thy name flew across the earth".

Until now, this unique tourist attraction has only been built and in operation during the winter season, but all that is about to change. The next challenge is to turn the Icehotel into an all-year round venue constructed on the water and powered by the sun, with the aim of becoming carbon dioxide negative. Volvo machines play a major role in this transformation with the mammoth tasks on site executed by Volvo wheel loader models L60E, L35B, L30B and a 1992 L50.

"When I first moved here, people told me that the winters are dark and cold. Even the tourist manager was convinced that nobody in their right mind would come to visit Jukkasjärvi during winter. He called it a 'cold hole'," says Icehotel founder Yngve Bergkvist. "I wanted to change that image, and started to think about how we could use the cold in a productive and exciting way," he continues.

COLLECTORS' ITEM

The result of his reflections now entices excited tourists from all over the world to stay in a hotel made entirely from snow and natural ice, with ice art exhibitions on display both inside and out. "We have actually had the biggest art exhibition north of Stockholm for 20 years running, without preserving a single piece - they have all gone back to the river every year."

As the popularity of the hotel has grown, there has been a knock-on effect on the local community and its inhabitants. "They have witnessed people coming from all over the world to experience 'their' winter," Bergkvist says, and gives the example of a visit by supermodel Naomi Campbell, who was encased in an ice bottle on the Torne River as part of an advertising campaign. "I think all of these things have helped to gradually change the old image of a cold and dark place to something more positive and productive," adds Bergkvist. "Nevertheless, we have never been satisfied with the natural off-season that the summer usually presents. And that's what we are going to change things with the new all-year facility."

NATURAL CYCLE

From a sustainability point of view, the Icehotel is already in a league of its own. The natural ice is cultivated and harvested from the Torne River, which flows past the Icehotel. Come spring, most of the hotel and all the artwork melts and returns to the river. This minimizes wastage and emissions as the ice does not have to be transported from ➜

THE EXTREME COLD IS A CHALLENGE FOR MAN AND MACHINE

Yngve Bergkvist

Petra Wadlund Lindh

PinPin Studio Christian Strömqvist

The ice playground

That arctic phenomenon the midnight sun provides a unique opportunity to generate power throughout the night. As a result, the sun will ensure that the guests at the Icehotel get a cold night's sleep and a warm welcome in the morning.

COOL CUSTOMER

Over the years, the unique construction conditions have presented new challenges for both man and machine. Alf Kero, the site manager, has been working on the venue for more than ten years. "The biggest challenge with planning and constructing the Icehotel is definitely the weather. The autumn never looks the same from year to year. The perfect scenario is a winter with between -10°C and -15°C starting in the middle of October," he explains.

The process of cultivating and harvesting natural ice has been fine-tuned over the years. "Starting in January, we clear snow from the marked areas on the river. We then use custom-made applications for the machines when we harvest from the middle of March and put the ice in storage for the next season. The extreme cold is definitely a challenge for man and machine as we are working at -30° to -40°C at times. For this purpose, we only use Volvo machines as they are fuel-efficient and generally regarded as the most reliable."

The machines are used to harvest ice and move snow and ice blocks used for building as well as clearing snow during the tourist season.

Bergkvist is enthusiastic about the imminent launch of the new all-year Icehotel, scheduled for December 2016. "We are basically building a shell that contains walls of snow and ice. There will be 20 rooms, a 200-square-meter ice bar and a large art hall with sculptures and exhibitions, all available 365 days of the year."

source to storage and any that is not used goes back into the river in spring.

"I have a background in environmental science and have always believed that you should be able to utilize and recycle every part of what you build," Bergkvist says. The goal is to make the hotel CO_2 negative, an objective set in 2008, and many steps have already been taken to minimize emissions in the near future.

The warm buildings within the hotel complex are heated using only renewable energy, storm water is used to save tap water and wastewater from the ice-storage cooling system is reused. All laundry is handled on site, saving on transport, and the facility repurposes the excess steam from washers and dryers.

Plans for the all-year-round hotel include a solar-cell park to keep the hotel chilled during the warmer periods.

The sketches reveal an architecturally sleek building, combining the hotel's smooth arched ceiling design with traditional methods and sustainable renewable energy. The state-of-the-art solar power plant will generate more than enough power to keep the facility cold during summer.

SUSTAINABLE FUN

There is something special for youngsters, too. Playgrounds in Kiruna, next door to the Icehotel, are covered with snow and ice for seven to eight months of the year. Local residents, working in conjunction with the Icehotel, came up with a solution in the shape of an ice park for children.

"We are building a playground made entirely of ice and snow, complete with slides, labyrinths and all sorts of fun things. It is being created with excess material from the River Torne and the Icehotel construction. It takes great precision to place and fit the pieces together," explains project leader Mats Persson, who also works as a machine operator.

The playground is a collaborative project between the Icehotel, Kiruna municipality, local government agency Tekniska Verken and designers at PinPin Studio. Students at the local school Hjalmar Lundbohmsskolan are also an important part of the process.

"Three years ago, the students made a very much appreciated 'miniature version' of the playground as a school project," says Petra Wadlund Lindh of the Icehotel. "This project is a continuation of that goal which was to make something that could be appreciated by children as well as adults. We simply want to make something fun but beautiful."

The playground eventually melts in April or May.

"It's fantastic to work on a local project for children, which at the same time is aesthetically beautiful. And it gives us a chance to share the knowledge of working with snow and ice that we've gathered over the 26 seasons we've been building the hotel," Lindh concludes.

www.volvoce.com/buildingtomorrow - www.icehotel.com

Visit the *Spirit* website or download the *Spirit* app for the video report

PinPin Studio Christian Strömqvist

Vision of the future

THE CHILLING FACTS

300 beds With 150 warm and 150 cold beds, the Icehotel complex also houses an ice church, ice bar, ice-sculpting studio and pillar hall, two heated restaurants, a lounge, four meeting rooms and two wilderness camps.

700 million snowballs The 35,000 cubic meters of 'snice' – a mixture of snow and ice – used to build the venue equates to the volume of 700 million snowballs.

1,000 ice crystals The chandeliers adorning the main hall comprise a glittering 1,000 hand-cut ice crystals.

-5°C /21°F This is the average temperature in the Icehotel, thanks to the insulating effect of the snow. Outdoor temperatures range from 20°C/68°F in July to -40°C/-40°F in January.

546 artists The hotel's suites are designed and crafted by artists from all over the world. Since its inception, the Icehotel has featured work by 546 artists.

BUILDING THE WORLD WE WANT TO LIVE IN

Volvo Construction Equipment unveils futuristic concepts and innovations to drive sustainability and change

by Charlie Ebers

Excitement was in the air at Volvo Construction Equipment's Xploration Forum, where hundreds of customers, members of the international press, government representatives, academics and employees gathered for an exclusive look at the company's most exciting research and development projects. Highlights at the event included: unveiling the LX1 prototype hybrid wheel loader – a machine with the potential to improve fuel efficiency by up to 50%, demonstrations of a prototype autonomous wheel loader and articulated hauler working together, and an electric site solution that showcased the new concept HX1 autonomous, battery-electric, load carrier. All of the innovations shown at the Xploration Forum – which was held at Volvo CE's Customer Center in Eskilstuna, Sweden, between September 9-14 – are ongoing research projects that aren't commercially available at this stage.

At the Xploration Forum, Volvo CE presented its electric site project together with its customer Skanska Sweden.

The two companies are collaborating on the SEK 203 million (€21.2m/$23.75m) project along with the Swedish Energy Agency and two Swedish universities – Linköping University and Mälardalen University. The project aims to transform the quarry and aggregates industry and predicts up to a 95% reduction in carbon emissions and up to a 25% reduction in total cost of ownership. The objective is to electrify a transport stage in a quarry – from excavation to primary crushing and transport to secondary crushing.

This involves developing new machines, work methods and site management systems. As well as a fleet of HX1s, other prototype machines that make-up the electric site system include a hybrid wheel loader and a grid-connected excavator. New technology encompasses machine and fleet control systems and logistic solutions for electric machines in quarries. →

LX1 prototype hybrid wheel loader and concept HX1 load carrier

Autonomous articulated hauler

"By using electricity instead of diesel to power construction equipment in a quarry we have the potential to deliver significant reductions in fuel consumption, CO_2 emissions, environmental impact and cost-per-tonne," says Johan Sjöberg, technical specialist in site automation at Volvo CE. "The electrification of construction equipment will produce cleaner, quieter and more efficient machines – this represents the future of our industry."

The electric site project is due to be completed in late 2018 when Skanska Sweden will incorporate the demonstration machines into its operations and test the electric site concept at a quarry in western Sweden for 10 weeks. "This research project is a step towards transforming the quarry and aggregates industry," says Andreas Sunesson, fleet and technology manager at Skanska Sweden. "Volvo CE's values are very much aligned with ours at Skanska Sweden – we both want to build for a better society and provide innovative, safe and sustainable solutions. This makes Volvo CE an ideal partner for us to collaborate with – and working together is essential when you're developing disruptive technologies like this. The electric site project is an inspiring leap towards the future of our industry, it has the potential to transform our business and we are anticipating exciting results."

ENERGY EFFICIENCY

Throughout the Xploration Forum, Volvo CE reinforced the fact that energy efficiency is at the top of the company's agenda. This was particularly apparent on the electromobility station, where the LX1 prototype electric hybrid wheel loader was unveiled. The machine is a series hybrid that incorporates a driveline that consists of electric drive motors mounted at the wheels, electric hydraulics, an energy storage system, a significantly smaller diesel engine and new machine architecture. It's this combination that enables up to a 50% improvement in fuel efficiency. On top of this, the LX1 also offers a significant reduction in emissions and noise pollution compared to its conventional counterparts. The prototype – which has 98% new parts and a fundamentally new machine design – is capable of doing the work of a wheel loader that's one size larger.

"Although we believe that there will be a major shift towards electric hybrid technology in the future, our customers, quite rightly, want improved efficiency now," says Scott Young, electromobility program manager at Volvo CE. "Today we are delivering this through more conventional technologies and soft offers. This is because we need to meet customers' immediate expectations in terms of total cost of ownership (TCO). A large part of TCO is energy cost, but other significant expenses include purchase price and maintenance. These aspects help drive our hybrid development plans. Therefore, before we launch a machine like the LX1, you can expect to see elements of this design incorporated into our products. This supports short and mid-term developments and requirements while the market continues to accept the technology, technology improves and the cost of new technologies decreases."

INTELLIGENT MACHINES

An exclusive demo of the prototype autonomous wheel loader filling the prototype autonomous articulated hauler, before dumping its load and repeating the cycle, wowed the crowds at the Xploration Forum. The demonstrator machines were programmed to work together and carry out a specific set of actions on a pre-defined route. They are standard Volvo products – an L120 wheel loader and an A25F articulated hauler – which have been upgraded with autonomous technology. The autonomous wheel loader can reach the equivalent of 70% of that of a skilled operator's productivity levels when loading and unloading. This is not just theoretical, the machine has also done 'real work' for a Volvo CE customer at an asphalt plant in Sweden.

Autonomous wheel loader

"Autonomous machines will increase safety in hazardous working environments and eliminate the possibility of accidents caused by human error," says explains Jenny Elfsberg, director of emerging technologies at Volvo CE. "They will also perform repetitive tasks more efficiently and precisely than a human operator and, because machines will be operated in the most efficient way, customers will benefit from improved performance, productivity, fuel efficiency and durability. In the future you could potentially have one operator for three or four machines, increasing productivity and further decreasing costs. But it's still early days for this technology. Currently these prototype machines don't communicate with each other and machine-to-machine communication technology – where machines 'talk' to one another and to a central control point – is crucial when it comes to avoiding collisions and facilitating an efficient flow of equipment."

SUSTAINABLE FUTURE

The Xploration Forum, which builds on the Innovation Forum Volvo CE held in 2013, was designed to underscore the company's position as the innovation pioneer of the construction equipment industry. "In line with the Volvo Group's vision to be the most desired and successful transport solution provider in the world, Volvo CE is committed to contributing to sustainable development," says Martin Weissburg, Member of the Volvo Group Executive Board and President of Volvo CE. "At Volvo CE, we've set ourselves four key technology challenges that we call Triple Zero and 10x: zero emissions, zero accidents, zero unplanned stops and 10x higher efficiency. We believe that our clear focus on electromobility, intelligent machines and total site solutions will help us achieve these ambitious goals and pave the way for a sustainable construction industry."

COLLABORATING WITH CUSTOMERS

Volvo CE has teamed up with its customer Waste Management – the largest environmental services and recycling company in North America – to field test the LX1. Waste Management, which owns one of the largest fleets of Volvo CE equipment in the world, is currently running a conventional machine to gather baseline data at two of its facilities in California. After being unveiled at the Xploration Forum, the LX1 will now be shipped to the company so that it can carry out fuel efficiency and emission reduction tests at these sites.

"We see Volvo CE as a strategic partner," says John Meese, senior director of heavy equipment at Waste Management. "We have one of the largest fleets of construction equipment in North America and want to use the best available technology to improve our operations and the service we deliver to customers. From the minute we were introduced to the LX1 we knew we wanted to work with Volvo CE to prove the concept in the real-world environments we operate in. We are anticipating excellent results when it comes to reducing the use of fossil fuels and lowering exhaust emissions. An additional benefit is the dramatic reduction in noise pollution."

MINING AT THE CUTTING EDGE

Site Simulation program plays a pivotal role in a family-owned garnet mining business

by Carol Cassidy / photographs by Dan Bigelow

The Barton family mining business started in 1878, harvesting garnet, a mineral known for its hardness and sharp edges.

At the time, miners worked with picks, shovels, and dynamite. "They used to do hand drilling, load the holes with dynamite, light the fuse – and run," says Chief Operating Officer Chuck Barton. "Now it's much more sophisticated. We have 3D models so we can understand the deposit and efficiently access the garnet."

His great-great-grandfather, company founder Henry Hudson Barton, started his career working in a jewelry store. The dark red gemstone, garnet, was one of the minerals he studied. Barton later married into a family that operated a sandpaper business.

"Back in 1878, everything was wood. They needed a better abrasive, for sandpaper," Barton says. "My great-great-grandfather reflected on his experience with garnet, and how hard it was, and how the edges were very sharp."

Barton says his ancestor researched and discovered a good garnet source in the Adirondack Mountains, in New York State. "He ended up buying an entire mountain," Barton says.

In the old days, workers used horses, wagons and winter sleighs to collect and move the garnet ore for processing. Now they operate sophisticated machines from Volvo Construction Equipment to excavate, load and transport a much greater volume of garnet ore.

Chuck Barton and his team made the decision to invest in Volvo machines with the help of a cutting-edge computer program called Site Simulation. Volvo CE Product manager Eric Yeomans worked closely with Barton employees to build the highly detailed, computer-assisted report and simulation.

REAL-LIFE DATA

The simulation analyzes site-specific data and maps out the unique terrain of each job location. The results include animation representations of the site, and information covering the proposed machines at work there. The animations are used to show the equipment at work and the resulting reports outline equipment information, such as cycle times, fuel consumption, operating and maintenance costs and future requirements.

"In Barton's case, the simulation was quite complex because it included four different haul roads with different road surfaces, grades, angles, curves, and even potholes. We used GPS to accurately capture the haul road information," said Eric Yeomans. Also taken into consideration were site specific information including speed limitations, work schedules, density of the materials, and other relevant information.

After analyzing the data, Kevin Fish, Barton's Quarry Manager says he was happy to recommend Volvo machines. "It was very informative for us," Fish says. "It helped show how we could improve with the new Volvo equipment in today's operating environment, and also where we could go in the future."

The simulation created estimates for how the mine site would evolve in the near term as well as the future. ➔

According to Fish, "The equipment meets our needs now – with a little extra capacity – and will satisfy our goals as we look down the road. The Site Simulation was a big part of the decision-making, for sure."

Territory manager Jeffery Osborne, of the Volvo CE dealership Vantage Equipment, says Site Simulation helped him show how Barton could make good use of articulated haulers. Osborne says he suggested the Volvo A40G full suspension articulated haulers for Barton because they adapt to the specific rigors of a particular site.

"On Volvo's full suspension truck," Osborne says, "the full suspension system is an active leveling system – each wheel has a hydraulic cylinder that is connected to an accumulator. The hydraulic cylinders raise the truck, and constantly adjust the suspension to payload. The pressure in the cylinders is used to monitor the payload via the on-board weighing scales. Each wheel has its own individual hydraulic cylinder, and each wheel moves independently. It's a much smoother ride. It's less stressful on the truck, the drivetrain, and most importantly, on the operator."

SMOOTHING THE WAY

Colby Gage, an operator on the Barton site, says: "We used to have old rigid frame trucks. They had no suspension and they would virtually bounce you out of the seat. The Volvo articulated trucks are smooth and quiet in the cab. They float and adjust themselves as you drive. You stay in the seat." Gage has also operated the Volvo EC480E and EC700C excavators on site. He calls them "fluent in motion, nice and smooth".

Osborne comments that a large excavator was definitely the right machine for loading the trucks. "When the rock is blasted there is oversized material that won't go through the crusher," he explains. "We were able to prove that it was easier to sort the oversize with the EC700C and set it aside."

In addition to smooth operation, other factors figured in Barton's decision to invest in Volvo CE machines. Financing was an important consideration.

Paul Voutrin, a district finance manager for Volvo Financial Services, helped craft a lease agreement that makes sense for Barton's specific needs, including maintenance and flexible terms associated with hours of usage. "Every month they know what their cost is, including normal service intervals. It's all in their lease payment. It's easy and they can forecast with that number."

Voutrin says financing has become more technical, with evolving market demands and an unpredictable economy. He explains that current conditions "call for more flexible lease opportunities and more creative ideas to better suit the customers and to help them with their purchases".

MAKING DECISIONS

Safety was another important factor in Barton's equipment decision. "Anytime you get a new piece of mobile equipment, you always get the new technology, and whether it is a restraining system, warning systems, or back-up cameras, it is technology which admittedly will cost a little bit more," Barton says. "But it's a safer vehicle for the operator and the people around the operator. With the Volvo equipment, the safety features have been absolutely outstanding for us." Because the company has a strong sense of environmental responsibility, Barton says fuel efficiency and the quality of emissions were also factored into the decision. "There's no doubt that those Volvo machines help with our environmental objectives."

Barton continues: "All of these factors rolled up to a decision that, at the end of the day, was actually a little bit easier than we expected. Volvo really did shine. Volvo's maintenance program, with all its bells and whistles, the financing program and the flexibility there, the safety aspect – the Volvo equipment clearly was the winner."

Barton still mines and processes garnet for abrasives in the Adirondacks. Over time, the Barton family has developed the business to include new markets, products and applications. The company produces and distributes garnet primarily for water-jet cutting and blasting media.

Barton says he's grateful to his great-great-grandfather for starting the family business and he wants to honor his memory by passing on a thriving company to the next generation. "There's special pride in being part of the business," Barton says. "There's also an enormous responsibility to make sure that the business grows as the family grows. I think my great-great-grandfather would marvel at where the business is today and how the markets and technology have evolved. I think he would be quite surprised at what the business has done since he started it 138 years ago."

Visit the *Spirit* website or download the *Spirit* app for the video report


Chuck Barton


Colby Gage


Jeff Osborne


Kevin Fish


Chuck Barton (left) and Kevin Fish


Paul Voutrin

SITE SIMULATION WAS A BIG PART OF THE DECISION

THE VOLVO EQUIPMENT CLEARLY WAS THE WINNER

PUTTING THEORY TO THE TEST

Eco Operators are learning new ways of working which are better for them – and for the environment

by Nathalie Rothschild
photographs by Birgitta Nilsson and Hans Jonsson

Training staff who work with heavy equipment to become Volvo Eco Operators can help companies reduce fuel consumption, which in turn lowers harmful emissions and cuts costs.

"One of Volvo CE's core values is protecting the environment and entrepreneurs who can save money by lowering their machines' fuel consumption are doing the environment a favor," says Martin Karlsson, an application engineer at Swecon in Sweden.

"The money the entrepreneur saves can be used to invest in new equipment, and newer machines tend to have lower emission levels. In that way, we help entrepreneurs work actively to protect the environment," says Karlsson, who heads the training and education division at Swecon.

Among other things, Karlsson is responsible for the company's Eco Operator training, but he and his colleagues have taken the program a step further, tailoring it to suit different clients depending on the sector in which they work: construction, production or industry.

TAILORED TRAINING

"The course introduces methods for moving and transporting material in the most energy-efficient way possible. Of course, an operator who only drives timber, for instance, is not interested in learning methods for transporting gravel, earth or wood chips, for example. So for those attending my lectures, it is important that they can relate to the material and to the information conveyed," explains Karlsson, "which is why tailored training is more attractive and effective."

OPERATORS IMPROVE THEIR TECHNIQUES

In short, the Eco Operator training helps machine operators improve their techniques in order to reduce fuel consumption and harmful emissions and lower wear and tear on machines. This can be achieved through proper planning and operation by trained operators.

For Karlsson, the first step involves visiting a company to analyze their fleet by looking at the machines' data and at how handlers use different operating modes. A productivity and cost study is then carried out on the worksite and the findings are used as material on

CHANGING HABITS CAN HAVE AN IMPACT

In the classroom

In the cab

the training day that Karlsson runs later on site for the machine operators. The training includes both theory and practical exercises.

Karlsson stresses that it is important that the operator can relate to the information conveyed in the course and can see how it impacts their practical day-to-day work.

"I use the machine data to present driving patterns and to explain the impact of how often you break and accelerate, for instance. I relate the data to how the operators themselves actually work and use the machines because it is important that they understand how and why this affects fuel consumption and how changing their habits can have an impact," he continues.

IN THE PICTURE

Karlsson takes photographs on site to integrate into his presentations so that the theory comes to life. Operators can then really relate to how different methods, transportation modes and road surfaces, for instance, affect fuel consumption and emissions.

Swecon also offers individual coaching, according to an operator's needs and demands. Furthermore, instructors compile a report of the information gathered on site and send it to the machine owner. The documentation can be used as a future reference since it contains a summary of the worksite visit as well as suggestions for improvements. There is also a follow-up visit some time after the training, where a new machine read-off is performed and a before-and-after training comparison is carried out.

"We return to the client about six months after the initial training to ensure operators don't fall into old habits, which is easily done, says Karlsson. He goes on to say that this year Swecon has trained 250 drivers as Eco Operators and aims to reach 500 by the end of 2016. Swecon plans to employ three full-time staff members to work on its tailored Eco Operator Training next year; currently, there are two full-time trainers and one part-timer.

Karlsson believes there will always be a need for eco training, even as the introduction of self-automated vehicles looms closer. "It will be a long time before we see fully self-automated construction equipment," he says. "And even if that happens, supervisors will be in demand and those supervisors need proper training to ensure the machines are as energy-efficient as possible. For instance, a machine cannot determine itself which scoop to use depending on what material is being transported – which is one factor impacting energy use. That will never happen, or at least not in our lifetime, so there will always be a need for this kind of training," Karlsson concludes.

VOLVO'S GOT TALENT

Just like in reality TV shows the world over, Volvo is made up of a diverse group of enthusiastic people who, whatever it is that makes them unique individuals, all want to do their best for their audience – the customer

by Brian O'Sullivan

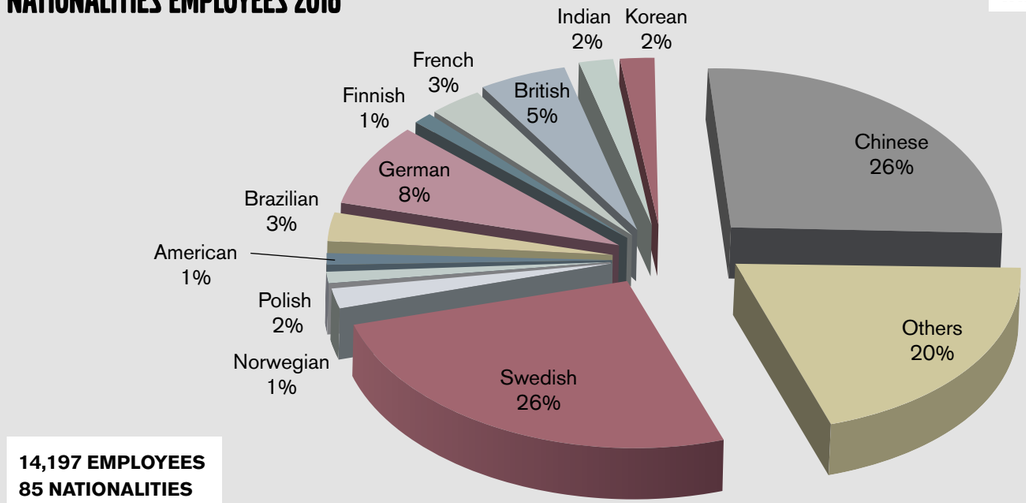
Vice President Talent Management, Volvo CE Kelley Dameron

Wouldn't life be boring if we were all the same, had the same opinions, wanted the same things and never disagreed? Of course it would – even the closest, most loving families have arguments – and companies are just the same. The best firms are made up of a wide mixture of backgrounds, beliefs, skills and opinions. Sure, there may be more quarrels than if everyone was exactly the same – but what great solution or invention ever came of 'group think'? Exactly – questioning and challenging ideas is the vital spark that leads to superior products and services – and happy customers.

A business is only as good as the people who work in it and research shows that talented and engaged employees are prepared to go the extra mile in order to do their best for customers. This, in turn, leads to more satisfied customers, greater financial success (for both customers and the company) and more resources available to spur yet more innovation – it's a virtuous cycle.

There are lots of factors that attract talented people to companies – but few are more important than fostering a diverse and inclusive corporate culture. Who wants to work for a company where their views and contribution is not valued? Being truly open to everyone not only attracts people from a host of different backgrounds, beliefs and abilities, it also welcomes and respects their contribution.

Our customers come in all shapes and sizes, with differing backgrounds, beliefs and experiences – and as a business Volvo CE needs to reflect that. Gone are the days when the company consisted mostly of white middle-aged Swedish men – today's Volvo CE is made up of a smorgasbord of different nationalities, ages and genders. While this is great, diversity isn't limited to just these factors – there is a whole rainbow of other facets that make us the unique individuals we are, and Volvo wants to reflect that diversity in its employee base.



MULTICULTURAL

"For us, diversity means everything that makes us different to each other," says Kelley Dameron, Vice President of Talent Management, whose job it is to make sure that Volvo CE's next star employee is not just hired – but shines to their greatest potential. "It includes obvious things such as age, ethnicity and physical appearance – but also less obvious elements of our personal make-up, such as thinking styles, religion, nationality, sexual orientation and education. When we have a truly diverse workforce there is great potential for new ideas and innovation."

While attracting multicultural people with a broad range of attributes is a necessary element in creating a high performing culture, on its own it is not sufficient. All the good work of being diverse is undone if some people are excluded or feel their opinions and ideas are not listened to or valued.

"The 'sweet spot' we are trying to achieve is to have diversity and inclusion," says Dameron. "Being more inclusive gives all employees a sense of belonging and being accepted for who they are, turbocharging the power of their experience and ideas for the benefit of the company – and its customers.

"We are working hard to create a supporting, inclusive culture, one that works together and makes the most of our differences (and similarities) for the benefit of everyone. When you achieve this, great ideas get heard, there is a lot of innovation, happier customers – and higher job satisfaction."

INCLUSION

Being inclusive is not always as easy as it sounds – and takes work. Making impartial decisions, listening without judgement and actively choosing to include others requires conscious effort. Did you know that most of our values and beliefs are firmly established by the time we are 10 years old (e.g. boys don't cry, girls wear pink, etc.)? Whether we like it or not, each of us is a mass of biases – things we like, things we don't, things we believe in – or don't. These quite natural prejudgments work away at the back of minds, subtly shaping our actions and decisions.

Volvo CE holds an annual Diversity & Inclusion week that puts the topics on everyone's agenda. As part of the program, employees are encouraged to examine their implicit associations, stereotypes and biases, and discuss in groups the type of thinking needed to make better, more impartial decisions. "This will help us be open to ideas no matter who brings them up," says Dameron. "It's about awareness. The techniques we show can be as simple as inviting input from someone in a meeting who hasn't yet spoken."

When we are competing for talent against the likes of Google and Apple, will Volvo's efforts to be as diverse and inclusive as it can help it be seen as a cool place to work? "Of course," she says. "Our products literally help make the world a better place – and that appeals to everyone, whoever they are. We are a market leader, and innovator with a great reputation for serving our customers well and doing the right thing. There is much for talented people of all kinds to find interesting and attractive at Volvo CE."

Volvo Peru exhibit at Expo Mina, Lima, Peru

PERUVIAN PROSPECTS

Volvo CE is now an internal division of Volvo Peru, adopting a unique business strategy for Latin America as it gears up for a new boom in Peru

by Marc Rogers

Peru is finding its groove again. Lauded as an 'economic miracle' and 'Latin tiger' during a decade-long mining boom, the Andean country struggled to maintain momentum in recent years as prices for key metal exports dipped. But things are looking up again: growth accelerated above expectations in 2015, the mining sector is back on track, and a new government is pledging massive infrastructure works over the next five years.

All of this is good news for Volvo Construction Equipment's plans to expand rapidly in one of Latin America's brightest economic prospects.

"We have an optimistic view at the moment," says Enrique Ramírez, Business Director of the Volvo CE division in Peru. He notes that the market for construction equipment – like the economy – is heavily influenced by trends in the mining sector. Business slowed when the commodity boom ended around 2012, but the election of a pro-business government in July is set to reignite the market.

"Even though it is still early to see concrete actions from the new government, the way it is presenting its plans and objectives makes us confident that there are interesting times ahead," Ramírez continues.

TAKING CONTROL

Ramírez, a 45-year-old executive with more than a decade of experience with Volvo in Latin America, was recently appointed to spearhead a radical shift in Volvo CE's business model. Since March, the distribution and post-sale support of Volvo CE machines in Peru has been managed by Volvo Peru rather than the third-party dealers typically used throughout the region.


Enrique Ramírez

"We found a situation whereby Volvo Trucks in Peru has a very strong brand image and is a leading player in heavy construction and mining," explains Ramírez. "We decided that the best way to serve the Peruvian market was to incorporate the Volvo CE business as an internal division of Volvo Peru."

The move has enabled the company to take advantage of the group's established business operations in Peru – including cross-border financing and the ability to trade-in second-hand Volvo machines – as it builds up a specialized and dedicated team for the Volvo CE unit. But Ramírez says the benefits go beyond internal synergies: "Volvo Peru's positive image in sectors that are also natural markets for construction equipment helps us increase visibility and grab the attention of key clients."

For now, the most sought-after Volvo machines in Peru are the L120F and L150H series wheel loaders, used in mining projects and increasingly in agri-business developments. Ramírez says the EC300 and EC380 excavators are also popular among those who use them, but acknowledges the challenge of making these models a core part of the business. The company is also looking to expand sales of other equipment like compactors and pipelayers, and has just started importing skid steer loaders and compact excavators with an eye to capturing part of a market currently dominated by backhoe loaders.

MAKING PROGRESS

All of this activity is laying the groundwork for what promises to be an exciting era for Peru and a window of opportunity for Volvo CE. Construction is due to start soon on a flurry of new mining projects, while President Pedro Pablo Kuczynski has outlined an ambitious plan to upgrade the country's dilapidated infrastructure, including major works in transport, health and energy.

"As in many Latin American countries, Peru still has a large infrastructure gap," says Ramírez. "There are many areas that can be developed, and the government is going to drive this, so we want to be prepared to serve our clients' needs."

A crucial part of the plan is developing the kind of world-class post-sales support that Volvo has earned a reputation for around the world. This includes good availability of replacement parts and the speedy resolution of problems in a country where reliable equipment is needed in hostile and remote areas, be it the high-altitude slopes of the Andes or the impenetrable Amazon jungle.

Faced with these unusual geographical challenges, Ramírez says his unit is developing customized maintenance plans for clients. "When we go to sell a machine, the service department is there with us – we can explain the benefits of the equipment and offer a range of services to ensure it has a high-level mechanical availability." As is standard procedure, the delivery of a new piece of equipment comes with a dedicated training program so that operators can maximize the technological and efficiency benefits of a Volvo CE machine.

Although still a small player in the Peruvian market, Ramírez is confident the new business model will elevate Volvo CE's brand and expand the company's market share to over 10% within five years. "The changes we are implementing will turn us into a more competitive brand. We're in an initial phase of creating an image of Volvo CE in Peru as a concrete and trustworthy option for our clients."

PLANT RENTAL PIONEERS

A German company is Volvo CE's biggest customer worldwide

by Nigel Griffiths / photographs by Juha Roininen

Managing Director Barbara Hoffmann

Manfred Hoffmann launched his plant rental business in the late 1970s in Germany and built Baumaschinen-Hoffmann into the largest independent rental company for heavy construction equipment in the country.
The company is located at Dorsten in the industrial Ruhr area of North West Germany, historically the country's coal and steel powerhouse. As the coal sector started to decline in the 1980s, Hoffmann identified a niche in offering rental construction equipment as a short-term solution for the difficult business conditions. This was a new idea for the German market, particularly for construction machinery.

"At the time there were only companies in the UK, the US and Canada exploiting this opportunity. We gave companies the possibility to rent by the hour. Today nearly every second construction machine in the world is rented," explains Managing Director Barbara Hoffmann, Manfred's daughter and now running the company's day-to-day operations with commercial manager Peter Lormann, who is also her husband. Both are trained economists.

BUSINESS MODEL

The pioneering rental business model developed by the team of Manfred Hoffmann and his wife Ingrid was based on providing extended full service rental service to blue chip industrial organisations, of which there were many in the Ruhr area. Today 85-90% of company business is related to long-term rental contracts with end customers.

With 1,200 machines located with customers, the fleet is dominated by wheel loaders and articulated dump trucks, but also extends to excavators, bulldozers and compactors etc. according to customer needs.

The strength of the business is the concentration on rental of heavy equipment above 20 tonnes, including comprehensive service and maintenance.

Hoffmann has long-term contracts of up to seven years with major industrial concerns from typically iron and steel works, open cast coal mining, power station operators, recycling companies, and construction firms.

The company is unique in Germany offering plant rental combined with comprehensive full repair and maintenance services, with guaranteed availability and stand-by equipment.

While Hoffmann has its own 20,000m^2 service centre, it also integrates with the infrastructure of its main customers, since many steel factories, quarries and coal mining operations have their own service and repair stations. The major energy utility firm RWE, for example, makes available service stations that are exclusively used by Hoffmann. Indeed in 2014, Hoffmann received an accolade from RWE when it won an award as the best supplier in the region. RWE praised the company for its service mentality, stating: "You are there when we need you". ➔

Fitter Markus Deitermann with Managing Director Barbara Hoffmann


Founder Manfred Hoffmann


From left: Manfred Hoffmann, Barbara Hoffmann, Ingrid Hoffmann and Peter Lormann

HOFFMANN HAS BOUGHT 99 MACHINES THIS YEAR ALONE

RESPONSIBILITY

With some 120 employees, more than eighty of are fitters/service engineers who are assigned long-term to customers. "We don't see many of our employees for weeks on end," explains Lormann, "as they are continuously engaged in servicing the machines located with our customers. They keep us informed nevertheless through daily reports.

"The type of person working for us fits into our family, non-hierarchical structure. With the support of Volvo CE and dealership SWECON, we give them full training, and then give them full responsibility to manage the customer and use their initiative to ensure they achieve the high level of service demanded. The fitter is then the first contact point for the customer – they have just one number to call."

Hoffmann encourages feedback and constructive ideas from its people in the field. "In our case it is a case of 'many cooks make for a better broth' - we respect them and they respect us," Lormann adds.

Though the regional industrial giants are the anchor and strength of their business, Hoffmann also services a growing number of SMEs.

"We try to balance our client base with smaller businesses as well as the big league players," explains Lormann. "Some require three to four machines, others 40."

To manage customers in eastern Germany the company has a second 20,000m² service centre located at Schwarzheide in southern Brandenburg, 40km from Dresden.

GROWTH

Since the early days as a two-person business, Hoffmann has grown to become a major customer of Volvo CE.

"The fleet of Volvo machines at Baumaschinen-Hoffmann now exceeds 400 units [general purpose and production equipment], making the company Volvo CE's biggest customer in the world," says Christian Krauskopf, Managing Director Volvo CE Germany. "And we expect it to expand further – Hoffmann has bought 99 machines this year alone."

THE COMPANY IS UNIQUE IN GERMANY

Alongside good products and support, Volvo's financial arm, Volvo Financial Services (VFS) is a key element of the package.

"We have had a close working relationship with Volvo Financial Services going back many years," Hoffmann explains. "We have always had an open books approach, keeping VFS fully up-to-date with our business situation, clients and prospects.

"This paid great dividends earlier this year when a major new contract was confirmed and we were able to meet senior Volvo CE personnel at the Bauma trade fair and conclude an order for 30 A30 articulated dump trucks within a few days." Several weeks later, Hoffmann ordered a further ten machines.

Key to the fast progress of the contract was VFS' in-depth appreciation of the company's business and finances.

"We have worked with this company for many years and fully understand the business model and client base, and we also know the people well," explained Michael Ksionzek, sales director of VFS. "The company was prepared to confide in us regarding the details of a potential major order and we were thus well prepared when the contract was confirmed."

"Through VFS we were able to have the bulk of the finance secured very quickly," adds Hoffmann.

"At a meeting attended by VFS, Volvo CE Germany, the dealer SWECON and the President of Volvo CE, Martin Weissburg, Volvo CE were able agree the deal and commit to delivering a large fleet of A30 articulated haulers at relatively short notice. The final machines were delivered and out with our customers by July.

"The speed at which Volvo was able to move was impressive," she says.

Though Hoffmann rents primarily leading brands of construction equipment, it steadfastly maintains an independence from manufacturers.

"Our main responsibility and the success of our business it to provide the right solution to our customers, whoever the manufacturer is," Hoffmann explains. "In providing a high level of full service, we need partners who can support us with everything from training to spare parts at the 'just in time' tempo of our business. Only a few of the manufacturers can achieve this."

Hoffmann concluded a major machine order at Bauma

RESALE VALUE

Another aspect of working with the 'premier league' in the construction business, is the re-sale value of older machines," adds Lormann. "Like any machine or car rental business, we are constantly analysing the operating hours and maintenance costs of our enormous fleet. There is always an optimum point to replace a machine and the best resale prices are always for the well-known brands."

Founders Manfred and Ingrid Hoffmann maintain a keen interest in the company.

"It is still a family business and every time we meet for lunch, however much we try, we never stop talking shop," Manfred Hoffmann admits.

He now sits on the Supervisory Board of the company and keeps up his contacts in the business.

"Construction equipment continues to be a personal business," he stresses. "A lunch or a round of golf with the head of a big company can still be worth its weight in gold.

Quarry operations manager Yuan Jian Zhong

EXCELLENT SERVICE BRINGS SUCCESS

Chinese dealers implement Volvo CE's after-market strategy to drive professionalization, differentiation and profitability

by Michele Travierso
photographs by Daniele Mattioli

Surrounded by the attractive bamboo forests of Moganshan in the Zhejiang Province, the Li Yu Shan Mining Co Ltd stone quarry produces small and medium-sized pebbles of mainly 20-25mm and 50-60mm. Thirty per cent of the quarry's output has ended up under many of the high-speed railway tracks that criss-cross China. A relatively cheap commodity, the product sells for 48-50 RMB (€6.5/$7.4) per tonne.

This part of Zhejiang, 60km from the provincial capital Hangzhou and 200km from Shanghai, is known for its cool temperatures during the region's scorching summers and is a popular destination for people looking to escape the heat.

Although the quarry is a large one employing some 60 people – last year it produced one-and-a-half million tonnes of pebbles – the machines on site are not brand new and the fleet, while well-maintained, is older than usually found on the average construction site. But herein lies one of the key reasons why Volvo Construction Equipment thrives in China, even after the slump in China's construction equipment market.

MAINTENANCE

Yuan Jian Zhong, the 47-year-old operations manager at Li Yu Shan quarry, has been buying and operating quarry equipment for more than 15 years.

Careful and periodical maintenance, such as that provided by Volvo CE dealership Zhejiang Liyang Machinery, based in Deqing, Zhejiang, is helpful for owners of older equipment, enabling them to obtain more mileage from it.

"I switched to Volvo CE on the advice of friends and colleagues who highlighted their better performance and after-sales service," says Yuan, adding that he was also →

VOLVO CE THRIVES IN CHINA

The quarry's Volvo machines are well maintained


Lou Li Hai, Service Director, Zhejiang Liyang Machinery

Volvo excavators are popular with operators

Operator Shen Dong Min

Awaiting maintenance at Zhejiang Liyang Machinery

prompted by the legendary low fuel consumption of the Volvo machines.

"Volvo excavators usually burn 14-15 liters per hour, but a competing product can reach 19 liters or more," he explains. During the course of a year, this means that operating a Volvo machine for about 500 hours a month can translate into significant financial savings.

Operator Shen Dong Min, 45, cites comfort as one of the reasons he enjoys working with Volvo excavators.

Since 2010, Yuan has purchased six EC210B excavators and two EC240B models for the company, and this year he bought another EC210B. The company has also just put down a 3m RMB (€400,000/$450,000) deposit for the first three of a batch of 15 machines for a new mining project, all EC380D models. Lou Li Hai, Service Director at Zhejiang Liyang Machinery says the company offers their customers three-year payment instalment plans to make sales easier.

TELEMATICS

The prize-winning dealership, owned by Cao Wei Guo, has been working with Volvo CE since the year 2000. Managing the maintenance of more than 1,000 machines in Zhejiang alone, it uses simple GPS telematics to alert customers to impending maintenance deadlines.

"This enables Volvo CE dealers to help customers extract an extra 200.000 RMB (€26.600/$30,000) out of the lifetime of a machine, even in the harsh conditions of a quarry," says Cliff Zou, regional service manager at Volvo CE China.

It was out of financial necessity that the system was developed in China when the construction equipment market started to suffer the results of the global economic crisis.

When the Chinese economy boomed, construction companies mushroomed. But as the crisis hit, thousands of these companies folded, leaving projects unfinished, jobs unpaid and, of course, equipment-leasing fees outstanding.

As the first mines and construction companies defaulted, financial institutions requested some sort of control over the equipment. Basic telematics installed on machines warned customers that payments were due. But construction equipment dealers realized the system could be used to monitor both working hours and the location of machines, enabling them to alert customers to impending maintenance deadlines.

SPECIAL CARE

Owners of older equipment who logged more than 100 working hours in a month were recommended to take special care of their machines, least they suffer unexpected breakdowns, the bane of the industry. Over time, this led to a virtuous circle of more regular maintenance, scheduled ahead of time, thus reducing down time to a minimum for customers and increasing sales of parts, a major source of revenue for dealers.

In 2013, this blossomed into CareTrack – a global solution that benefits Volvo CE customers worldwide. CareTrack, which runs parallel to the system used in China, has more advanced capabilities. It generates a wide range of reports – including fuel consumption, operational hours and geographical location – via a web portal, as well as sending SMS/email alerts. Fleet managers can reduce fuel costs, optimize machine and operator performance, and proactively manage service and maintenance to maximize uptime. Dealers can also troubleshoot faults remotely.


Overhauled engine at Zhejiang Liyang Machinery


Service workers Liu Xin Qiang and Qi Kai at Zhejiang Liyang Machinery

CREATIVE COLLABORATION

Volvo CE designers spearhead the company's constant search for innovative solutions

by James Gibbons / photographs by Gustav Mårtensson

Manipulating a virtual excavator

Volvo Construction Equipment's Director of Design Sidney Levy regards himself as a facilitator. For him, the best course of action is to bring together the thoughts and ideas of as wide a variety as possible of people who have knowledge of the industry – from designers to technicians to engineers and end-users – and pool that expertise, directing it towards coming up with innovative products.

"If we do a good job in Product Design we will obviously achieve our goal of making people more efficient," says Levy, adding: "But we also want them to be a little bit delighted." That's the other thing Sidney Levy does: provide solutions for customers, including customers who weren't even aware they had problems they needed solving.

COLLABORATION

Spirit caught up with Levy at the Mölndal offices of CPAC Systems, just outside Gothenburg, Sweden's second largest city. CPAC is a wholly-owned subsidiary of Volvo dedicated to resolving problems through technology and making it work better for the customer.

"Technology is really fun, it's great," says Greger Landén, CPAC's Technical Director for the Construction Segment. "But technology in itself does not have value unless it actually produces something for the customer." One of CPAC's maxims is that they don't mind re-inventing the wheel, which may be why they and Levy's Product Design team work so well together.

"I think the collaboration between CPAC and Volvo – not only Product Design but also Volvo product owners and Volvo Engineering – has been extremely important in order to mitigate all the risks in creating such a solution," Levy says.

In one room, banked seats are provided that could be for serious talks, although the drum kit, electric guitars, amplifiers and a scattering of toy bears witness to its occasional use as a place in which to entertain the children that staff members occasionally bring with them. Also in the room is a virtual reality kit, for which the view in the headset is matched by 3D images on a large screen while the headset wearer uses twin controls to manipulate a virtual excavator. It looks entertaining, and the sort of thing tech-minded teenagers would love to play with, but as with most of the equipment here it has a serious purpose.

SIMULATION

All over the premises, experts and technicians are hard at work writing computer code and testing out ideas not only on each other but also on a surprisingly realistic excavator simulator. It comes complete with a view of a virtual quarry from the open cab and – most importantly – a working Volvo Co-Pilot equipped with the Dig Assist function. Specialists may spend hours sitting in the driving seat, laptop on knee, putting the excavator through its paces and making copious notes while, it seems, also writing computer code. The version of Dig Assist in use is already being re-examined to see if it can be improved. ➔

Co-Pilot touch screen tablet in the cab


At the controls of the excavator simulator

Working with a model excavator arm


Sidney Levy


Greger Landén

Co-Pilot, of course, is the tablet-sized Android-based screen interface that keeps an operator and management team informed of progress, while also setting things such as the angle of a bucket, trench profile and depth of a dig. Set up in advance, it makes the operator's job easier while keeping an accurate record of the work done for staff in the back office. Getting to this stage has been a collaborative effort.

"Together with some of our colleagues, we went to various work sites and really tried to understand the essence of problems facing our customers," says Levy. "We were able to iterate many solutions and really find a way for people to work together in a more efficient way, and also in a more pleasant way."

Quite often, these site visits reveal quicker ways to achieve better results, using technology that had never crossed the customers' minds.

"Exactly," agrees Magnus Andersson, Chief Designer on Volvo CE's Use and Experience design team. "It is also about finding the unrealised need of the customer, really, to be creative, to be close to the customer and basically find new ways to solve their problems."

Andersson demonstrates how Dig Assist works using the Co-Pilot mounted on the simulator, which another technician is putting through its paces while trying to identify possible improvements. Elsewhere, two other members of the team are already looking into the next generation of the app.

ADDED VALUE

The evolution of Co-Pilot hasn't always been smooth going, with occasional disagreement among the various collaborators involved, mainly Volvo CE, Product Design and CPAC. This is what Richard Berkling, CEO of CPAC, refers to as 'creative friction'. He acknowledges that his company and Levy's Production Design team came to r ealise through their joint creative efforts that they could work together productively.

"Looking back, I'm quite convinced that they [Levy and his team] are very important contributors to the fact that we managed to launch something that is creating a whole new business opportunity for Volvo CE in only two-and-a-half years," he says. "The fact that they came in and addressed the customer perspective even better than Volvo CE and CAPAC do, managing to iterate the feedback from customers in visual design in a very clear way, I'm now convinced contributed to saving a lot of time and a lot of development costs."

What matters at the end of the day is better value for customers, a point upon which the ever modest Levy would agree. "Product Design on its own does not really add that much value," he concedes. "We're adding value when we're working with some other departments, so together we're able to input our new ideas and new processes and from there Product Design is able to quickly create some new prototypes, iterate them together with this cross-functional team and really come up with solutions that are best suited to our customers."

Co-Pilot already encompasses Dig Assist, Load Assist *(see article p.36)* and Compact Assist, while Pave Assist is close to launch. All are subject to constant updating to remain ahead of the game.

"It's not only our work, really," Levy points out. "It's the responsibility of everybody being able to judge and make the right decision on what is important and what we want to solve as a company."

SITE VISITS REVEAL QUICKER WAYS TO ACHIEVE BETTER RESULTS

Skanska wheel loader operator Leif Andersson

MAKING LIGHT OF THE LOAD

Volvo CE works closely with customers to develop the technology they want and need

by James Gibbons /
photographs by Gustav Mårtensson

Operator Leif Andersson could never be accused of not taking his job seriously: he most certainly does. It is simply that he enjoys the way Volvo's Co-Pilot and its Load Assist system helps him to do it. And so he should: he played a part in its development.

Andersson operates a Volvo L180H wheel loader for the Swedish multinational construction company Skanska, in a quarry just outside Gothenburg. During a visit in 2015 to the Volvo Construction Equipment wheel loader factory at Arvika, in western Sweden's Värmland County, he showed such interest in the Co-Pilot after seeing a prototype that he agreed to test it on a new machine. Working closely with Volvo technicians he has suggested ways to improve it and is pleased with the outcome.

"I like it very much," says Andersson. "I'm very happy with the journey. It's great. It's fun."

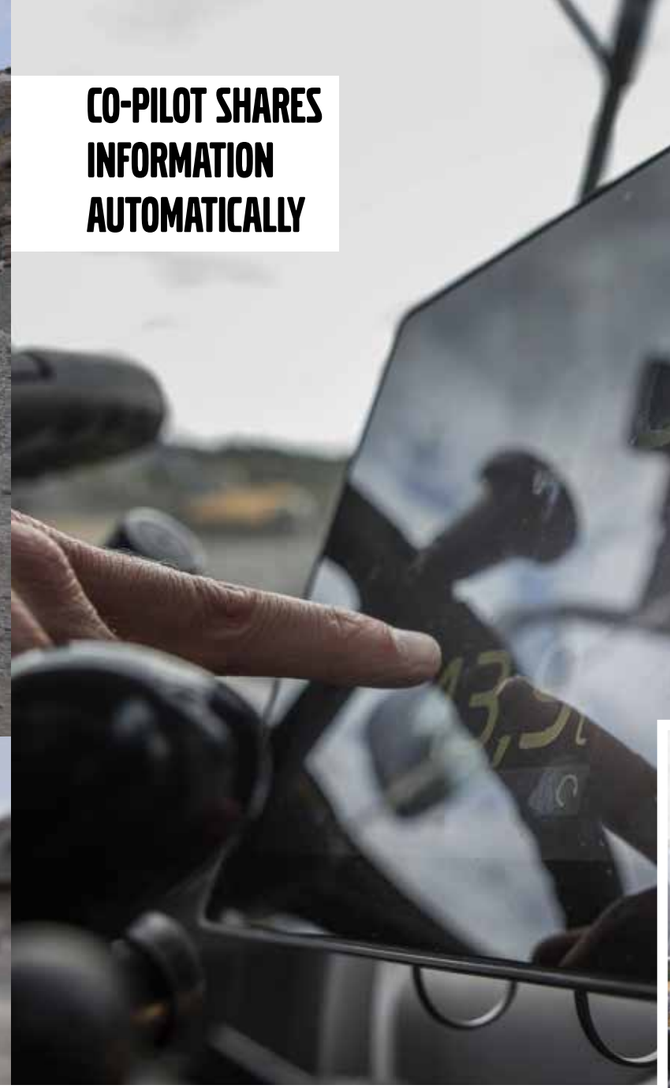
The 'human-machine interface', or HMI, comes down to how easy it is for people to work with the technology: in the case of Load Assist, Leif Andersson couldn't be more delighted. "I like the interface on Co-Pilot," he says, "It's easy to understand and Volvo has done a a great job making it simple to work with. Functions such as zeroing the load involve one button to push that I like." ➔

CO-PILOT SHARES INFORMATION AUTOMATICALLY

Volvo CE has a close relationship with operators using the end product


Daniel Cerny, Volvo CE


Scott Haylock, Volvo CE



PHILOSOPHY

It is exactly this close relationship with operators using the end product that is very much a part of the thinking at Volvo CE.

"One of the philosophies behind Co-Pilot is being able to provide customers with services that they require in the market place in a timely fashion," explains Scott Haylock, Manager for Productivity Services at Volvo CE. "We've tried to develop applications that fulfil what we believe are their immediate needs and then work with operators like Leif Andersson to further refine the interface, make sure the flow works for them, because it really is about providing operators in the cab with information and guidance to enable them to work more efficiently." More cheaply, too: by ensuring completely accurate load weights, Load Assist, if fitted to every loader on a site, could remove the need for a costly weighbridge. It would no longer be needed to ensure that each truck has been loaded with exactly the right weight, no more, no less.

What's more, Co-Pilot shares the information it gathers with site management staff automatically, using Volvo's CareTrack telematics system that monitors machines.

"The operator immediately sees the result in the cab," says Daniel Cerny, Business Manager for Productivity Services at Volvo CE, "but the data is also available through CareTrack to the back-office staff and can also be uploaded to the Cloud."

VERSATILITY

Cerny is also keen to stress that Load Assist works with attachments other than buckets.

"That's another great feature of Load Assist for Volvo CE, that it can be used for other attachments such as pallet forks," he says.

Andersson was able to demonstrate the system's versatility by carrying a heavy concrete-based road sign on a set of quickly attached pallet forks.

"I can load more tonnes in a faster way per day with Co-Pilot and I'm very pleased with the system." Sensors mounted throughout the machine are able to measure, for instance, pressure from the hydraulic system but also position of the front loader frame, the lifting arms and the tilt mechanism. The information is then computed to produce a precise calculation of the load, regardless of how complicated the movements of the bucket may be.

For operators, Co-Pilot has the advantage of providing all the relevant information on one single tablet-like screen – even the image from the reversing camera – but without hiding the load information. It is a feature Andersson says he appreciates.

"When I have the reversing camera on, I also see the goal and target numbers nearly as clearly as when the reversing camera is off," he says. "It makes it easy to keep track of everything when I have only one screen in the cab." The touch screen replaces many consoles with just one, meaning fewer displays in the cab and a focus on key information, thus greatly improving productivity, reducing stress and enabling the operator to work more safely.

He explains he can call his Volvo CE technician contact if a problem occurs and they solve it together. But the co-operation is not just one-way: when his Volvo CE contact has a question, he in turn calls Andersson for help. "We help each other," says Andersson.

Another advantage of Co-Pilot is that it allows small operators without a back-office team to keep accurate records.

"There's an in-built work-order management solution in the Co-Pilot," says Haylock. "Part of the application is that you can create work orders and track information that can be downloaded to a USB stick." With the optional SIM card, the information can even be sent to a home or office computer. So it would appear that Load Assist not only helps level the ground, it also levels the playing field.

Frederic Lastre, Director Project Office Central Europe, Volvo CE and Valentina Ericson, Director Strategy & Communication, Volvo CE

PERFECT PARTNERS

Through regular interaction Volvo Construction Equipment engages with its key suppliers to nurture the good relationships critical for both sides

by Nigel Griffiths

Faced with globalization and the rapid industrialization of new markets, companies such as Volvo CE have to be nimble and fast-footed in the market place. This requires strong, long-term relationships with suppliers.

Volvo CE regularly brings together its key suppliers to meet senior Volvo CE leaders for strategic discussions. These meetings, organized regionally in Europe, Asia and North America, are becoming increasingly important for Volvo CE, explains Rahmi Toptas, Director Supplier Development Europe, Purchasing and Supplier Management.

"By bringing together Volvo CE's top management with our key suppliers, we get across the same strategic messages in one go. We also have an opportunity to engage in frank discussion and gain valuable feedback from our production partners.

Indeed, it is not necessarily easy being a supplier to Volvo CE, Toptas admits. "We are very demanding. The standards for our suppliers are pretty close to the requirements of the automotive sector: just-in-time delivery, low stocks in warehouse, guaranteed quality, etc. Volvo CE is also very advanced in developing a green supply chain, which is a 'must' requirement for suppliers.

"To be a supplier to Volvo CE, you need to be in tune with what is happening here. We cannot change our own strategies and product lines fast if the suppliers cannot keep up. They are the experts in their product areas, and often need to find the clever solutions. If we both get it right, the payback is enormous."

Volvo CE's biggest suppliers in Europe get together

Rahmi Toptas, Director Supplier Development Europe, Volvo CE

A GREEN SUPPLY CHAIN IS A 'MUST'

Volvo CE's suppliers deliver the key components of the company's machines: everything from the chassis, transmissions and power trains down to simple screws and bolts. All in all, it is an enormous volume of parts and a big annual spend.

MOVING TARGETS

"These suppliers are a key part of how we build our machines. Every part we buy has to fit perfectly and work seamlessly with guaranteed quality," Toptas says.

The Supplier Days' events have been very successful over the years and are greatly appreciated by our suppliers, he adds.

"The meetings give us time to share information with them in an open way. We can be open and transparent about where our businesses are going and align our suppliers around our priorities. At the end of the day, we are looking for a long-term relationship which is profitable for both parties. If they don't survive, we won't survive. We need each other long term."

It is important for Volvo CE to get supplier reaction and constructive feedback on its strategic thinking, Toptas continues.

"In the past, we talked about a three years strategic period for our business but now things are changing so fast, we face many moving targets. So this discussion forum genuinely helps shape our future actions together.

"Today's global market is becoming more challenging. Competition is becoming tougher and tougher and we must be at the top of our game in managing the necessary changes and making sure it always becomes a competitive advantage," he says.

On September 21-22 at the European Supplier Days, more than 100 of Volvo CE's biggest suppliers in Europe came to its Brussels headquarters for two days of presentations and discussions.

"These suppliers are very important to our business and we are important to them," Toptas stresses. "Our business volume often representing 10 to 30% of their turnover. It is also a useful occasion to organize individual face-to-face meetings with suppliers from distant regions and build personal relationships."

RIGHT FIRST TIME

The overriding theme for the 2016 Supplier Days was the importance of getting supply chain collaboration 'right first time', so as to further strengthen competitiveness and guarantee customer satisfaction at all times.

The two-day meeting brought together Volvo CE senior management with key account managers and senior management from the suppliers. Volvo CE's senior executives gave an overview of the world market for the company's products, showing where it is going and where it is experiencing or anticipating bottlenecks.

"It is important that we give the key messages straight to the people at the top," Toptas says. "We have a very strong focus this year on the delivery of our future new products 'right first time'. This means from the quality, delivery and cost perspective and we won't achieve this without having the right suppliers with the right relationship.

"In recent past meetings we have focused on issues such as supplier agility and lead time reduction. And indeed since these meetings, and from a quality, cost, delivery (QDC) perspective, we have been successful and have seen great improvements on supplier lead-time, delivery precision and quality performance."

Toptas has a 50-strong supplier development staff under his wing. This team focuses continually on ways of improving quality, delivery and cost using lean manufacturing tools. "If we detect any difficulties, we go to our suppliers as troubleshooters and find ways to optimize the production and delivery processes and assist in the identification and elimination of waste

"I believe that today we have a good supplier base, and one founded on a long-term relationship and close collaboration. We need them as much as they need us. It is a collaboration of trust and understanding. We can go nowhere without our suppliers."

A MINI MARVEL

Volvo and LEGO® Technic have teamed up again to build a faithful working replica of the new EW160E wheeled excavator

by Brian O'Sullivan

Volvo Construction Equipment and LEGO Technic both have a passion for creating the best products they can, and so it was natural that when the two companies came together to create a scale LEGO model of Volvo's new EW160E wheeled excavator that the end result would be stunning. Such was the closeness of the relationship and desire to get the model looking just right, that when Volvo's chief designer thought the prototype's exhaust wasn't quite perfect, the LEGO team gave him some of the famous colored pieces and said: "Okay – you design it."

The end result is spectacular. With 1,166 elements the model will repay the hours it takes to build it. Featuring a rotating superstructure, elevating cab, clamshell bucket and a pneumatically powered boom and arm, it is packed full with realistic functions. Principally aimed at children over 10 years old, such is the complexity and delight in creating it that the model's attractions have no age limit.

This isn't the first time that a Volvo machine has featured in the LEGO Technic model range – the Volvo L350F wheel loader was the star machine of the 2014 season. For 2016 LEGO Technic wanted an excavator – but one that was a little different to the norm.

"We knew that we wanted to create a wheeled excavator, but we wanted something a little different," says Andrew Woodman, senior design manager for LEGO Technic. "When we saw Volvo's elevating cab option we knew that was the one for us."

SECRET VISIT

The timing was perfect, as the new EW160E wheeled excavator was nearing the end of its top secret development. Such is the trust between the two companies that Volvo invited Woodman, the model's designer Olav Krøigaard and marketing lead Niels Henrik Horsted to visit Volvo's manufacturing plant in Konz, Germany. The designer climbed all over the real machine and took an extensive tour of the production line to see how it all goes together. He even got to operate one. "It gave the designer amazing insights into how to design and build the LEGO Technic version," says Woodman. "For instance, he found that the base of the boom on the real machine isn't sited in the middle, but is slightly offset. And so the boom on the LEGO model is also sited off to one side."

This greater insight meant that the model was impressively close to the real thing right from the first prototype model. "The Volvo team were impressed with what we had achieved so early, and were then able to hone in on the details," says Woodman. "They helped us with getting the proportions right, improving the hand rails, how the bucket hung and even the shape of the exhaust."

AUTHENTIC

The final model is a mini masterpiece, with many of the real machine's functions present. The digging arm works, the cab raises and lowers, it has a blade and stabilizers, steering – even the correct arm rests on the operator's seat.

There is also a pneumatics system that is operated by an all-new hand pump. While using electric motors and actuators would have been an option, using pneumatics was considered a more authentic solution. "We wanted to create our version of the machine's hydraulics," says Woodman. →

Model EW160E wheeled excavator

"Air replaces oil, but the principle of pressure being applied through a pipe system is the same as on the real machine, and the air pressure can be diverted to the chosen function, just as on the real machine."

As if making this model wasn't difficult enough, a second designer, Milan Reindl, was challenged to make an alternative second model, using the same LEGO elements. This has been achieved in some style, giving the customer the choice of making the EW160E wheeled excavator or a very impressive Volvo L30G compact wheel loader. "The cool thing about this model is that both the L30G and the EW160E are made in the same Volvo factory in Germany," says Woodman.

The EW160E is compatible with the optional 'power functions upgrade' box, which includes a battery pack and motor that fits inside the model. This powers the pneumatics compressor, as well as providing working lights on the cab.

CHALLENGE

With so many features and elements crammed into such a compact model, building the EW160E is a real challenge. So what's the secret to getting it right?

"The building process is part of the play and where the main enjoyment lies, seeing how everything goes together and how it operates. The post-build play is secondary, almost a bonus," says Woodman. "So the build shouldn't be rushed, this isn't fast food. We recommend that you lay all the parts out in a quiet corner of the house, follow the instructions carefully and take as long as you need to get it right. And then afterwards you can play with all the functions, just like with the real machine."

With its good balance of functionality and complexity, the LEGO Technic EW160E is in the sweet spot of the range. Launched on August 1, sales have already exceeded expectations, sealing a relationship with Volvo that has been complementary from the outset.

"Volvo really 'leaned in' to make this project the success it is," says Woodman. "We share the same passion and mind set, and it was a lot of fun working together. We take a pride in our cooperation with Volvo, and it's the benchmark for how we can cooperate with partners in the future."

SEA OF LEGENDS

Sailors on course for their greatest challenge yet in the next Volvo Ocean Race

by Julia Zaltzman

Just when you think it cannot get much tougher, they go and raise the stakes! Already the most physically gruelling and mentally testing professional sailing challenge in the world, the new route for the Volvo Ocean Race 2017-18 edition is undoubtedly one that will separate the wheat from the chaff.

Featuring almost three times as much Southern Ocean sailing as the previous event, the 2017-18 race will be contested over the longest distance in race history at around 45,000 nautical miles (nm), crossing four oceans and taking in 11 major cities on five continents.

Once again, competitors will set sail from Alicante, on 22 October 2017, with a 700-nm sprint to Lisbon, Portugal. The fleet will then plunge south towards Cape Town in South Africa to embark on an epic few weeks racing through 12,500nm of Southern Ocean where the fast-moving, ice-cold waters around the Antarctic harbour some of the deepest weather depressions. It is no mean feat. Even for the world's best sailors, the Southern Ocean does not play fair.

"It's a very different kind of sailing to the rest of the racetrack. It's where legends have been made and people are at their absolute limit," says newly appointed race CEO Mark Turner.

LONG LEGS

As well as providing some inevitable hairy moments, the new Southern Ocean course replaces what used to be two very long and laborious (from a sporting perspective) legs up to Abu Dhabi and on to China at low latitude. Instead, the →

IT'S A VERY POWERFUL GLOBAL BUSINESS PLATFORM

Newly appointed race CEO Mark Turner

Photograph: Ainhoa Sanchez / Volvo Ocean Race

fleet will now head back north across the equator to Hong Kong SAR, China in what will be one of the longest stages in race history.

The boats will stop off in Guangzhou, China where an in-port race and full set of stopover activities will be held, before resuming from Hong Kong to Auckland, New Zealand. The course then heads back through the Southern Ocean, around the infamous Cape Horn, and up through the South Atlantic Ocean to the southern Brazilian city of Itajaí.

"In losing Abu Dhabi from the equation, we've lost the Middle East as one of the commercially valuable areas of the race," says Turner, "but the race itself is still going to 11 great stopovers from a business perspective. Two of the new venues we're visiting are Hong Kong, a great hub of Southeast Asia and an iconic city, and Guangzhou, in mainland China, one of just four premium Tier-1 cities in China. It's the first time the race will visit a Tier-1 city so both those places are very important."

The new Southern Ocean leg also means that whilst it will be the longest-ever route in nautical miles, it will actually be significantly faster – an average boat speed of 4 knots faster and almost a third quicker than the previous race in terms of average speed around the world, says Turner.

STRESSFUL

"It's a very wild, very untamed place with weather conditions that just push the people in the boat to their limit. It's probably one of the only places in the world where you may have to throttle back a bit, and not have the pedal down the whole time, and that's where the pressure and stress comes in."

The change in course will have a big impact on the race, on what matters, even the kind of sailors that will take part, Turner says. Even more so now that the two Southern Ocean legs will be worth double points, which means they count twice as much.

"There's a thin line between how hard you push to be safe, and how hard you push to win; that line is a key aspect all around the racecourse but particularly in the Southern Ocean. So we're really putting the focus back on this part of the ocean – it's where the lows and the highs are more intense, as is the fear and the happiness. On the leg from Cape Town you really do go deep down into the Indian Ocean, and it's the most renowned section for catching sailors out, so the teams may not always enjoy all of it but it's a place where any sailor wants to have gone and raced," Turner explains.

From Brazil, the route takes the teams back into the northern hemisphere to the Eastern seaboard of the USA, Newport, Rhode Island before a blast across the North Atlantic where they are due to arrive in Cardiff, capital city of Wales, in May 2018. Then it is a short but testing leg to the penultimate stopover in Gothenburg, Sweden, before ending with a grand finale in The Hague, Netherlands.

"One of the key additions to the race is that we're going back to the United Kingdom for the first time in 12 years," says Turner. "The UK is the origin of the race, so I think that's very important. We're really reconnecting with our roots in many ways, but equally maintaining this very powerful global business platform going to all the major continents and a lot of the major markets."

For Turner himself, the role as race CEO follows hot off his success as executive chairman of OC Sport with the Dongfeng Race Team, which came third in the 2014-15 edition. They were the first Chinese sailing team to take part in the Volvo Ocean Race, crewed by the first Chinese sailors ever to take part in any form of competitive, global offshore sailing.

"They held their own, went up some steep learning curves and went back heroes," says Turner. "We're expecting the Dongfeng Race Team version 2 back on the racetrack soon, so it was a very successful campaign, the sponsors were very happy, and the sailing community in China got a big boost from it. It was also the first big sports sponsorship of any government in China, so as a case study for using sport and the Volvo Ocean Race in China it's been a very powerful campaign."

For 2017-18, however, the focus for Turner and his team is on the commercial side of things, and, of course, to have eight boats (in the new design) on the start line. "We're in good shape compared with other cycles, but we've got plenty of work to do to get those teams across the line.

"In terms of thoughts for the future, I think we've probably increased the commercial value of the race with the current changes and additions. The Middle East will remain an important area to go to, but there are plenty of other areas that we can open up from a business perspective that will also add more value. Everything is on the table for the future; there's no constraint with that one," concludes Turner.

Mark Turner previously worked with Dongfeng Race Team, the first Chinese sailing team to take part in the race

Photograph: Ainhoa Sanchez / Volvo Ocean Race

PEOPLE ARE AT THEIR ABSOLUTE LIMIT

BATTLE OF THE SEXES

Who are the best operators – men or women? *Spirit* hosts a light-hearted challenge

Text and photographs by Brian O'Sullivan

Fredrik Sjödin

Hanna Jansson

Female machine operators were once regarded as a novelty, but with increasing numbers of women choosing to jump into the cab the debate has shifted from: 'Should women operate machines?' to 'Are women better operators than men?'

At ***Spirit*** we decided this was a question that should be answered. And so we went to Volvo CE's state-of-the-art Customer Center in Eskilstuna, Sweden, armed with notebook, stopwatch, three devilishly difficult challenges, and two of the best operators we could find – one male, one female.

Competing against each other are Fredrik Sjödin, 35, an instructor at the Customer Center with more than 10 years experience operating haulers, excavators and wheel loaders, and Hanna Jansson, 24, an EW140 wheeled excavator operator for Swedish highways and earthmoving contractor Br Engström for the past six years. Both are experienced operators, and each claims to be 'in the middle' when it comes to their talent using machines. They also agree on the skills needed to be good at the job – an interest in the work, calmness and the ability to get on with people rated highly. Both too have machinery in their blood – Hanna grew up on a farm and Fredrik 'drove' his first backhoe sitting on his father's knee in 1983 at two years old.

Fredrik says his favorite machine is the Volvo EC220 excavator: "It's smooth, strong, fast and can handle both heavy earthmoving jobs and delicate work, such as fine grading." He maintains that being "good at planning jobs in the right sequence" is part of the secret of being a good operator, while Hanna – who prefers wheeled excavators over other machines – says she thinks the key is "calmness and good awareness".

CHALLENGE 1: CLOSE THE MATCHBOX VOLVO EC750E EXCAVATOR

How hard can it be to close a matchbox? Quite hard actually, even when using Volvo CE's new 75-tonne EC750E excavator. With the operator sitting high up and more than 20 feet (6.096m) away from the tiny box, hand-eye coordination is key, as is delicacy of movement and a good sense of distance and perspective. Helping them out are the EC750E's sensitive and smooth hydraulics, good cab visibility and the ergonomic positioning of the controls.

Starting with the bucket on the ground, the operator has to close the box in the quickest possible time, with penalty points of one second added for every millimetre the box isn't completely closed. And – a real possibility in the windy conditions – disqualification if the box is knocked over or damaged. The clock stops when the bucket returns to the starting position.

Fredrik: 1:20.48 minutes

Hanna: 0:59.32 minutes plus 5 seconds penalty points for leaving the box open by 5mm; total score 1:04.32 minutes

Result: Hanna 1: Fredrik 0

CHALLENGE 2: HAULER SLALOM VOLVO A25G ARTICULATED HAULER

As if maneuvering a 23-tonne capacity articulated hauler along a 60m course and negotiating four slalom posts were not difficult enough, this challenge demands the operator does it both forwards and in reverse, in the quickest possible time. Despite the newly launched A25G hauler being Volvo CE's smallest hauler, with the slalom posts spaced barely further apart than the length of the machine, this challenge tests the operator's spatial awareness, precision and – with 10 second time penalties given for hitting the posts – the contestants need to balance the need for speed with accuracy.

As Hanna doesn't operate a hauler in her job, Fredrik is the strong favorite in this challenge, and it's Hanna's turn to go first. With neither operator incurring penalty points, Fredrik is the winner.

Hanna: 01:45.72 minutes

Fredrik: 0:57.24 minutes

Result: Hanna 1: Fredrik 1

CHALLENGE 3: TYING THE KNOT VOLVO EWR150E WHEELED EXCAVATOR

This challenge entails picking up a length of rope, draping it over the top of a timber frame, tying a knot with the rope and then lifting the top beam of the frame off its supporting posts. To help them, the contestants are using Volvo's recently launched EW150E, fitted with a Steelwrist X18 hydraulic grapple. This combination turns an already maneuverable machine into an amazingly dexterous tool, one that is capable of the finest, most delicate movements.

Involving six different actions (tilting, operating the grapple, boom, arm, rotator and moving the machine) all in concert, this challenge tests the mastery each operator has over the machine – all under the pressure of timed conditions.

This is a machine type that Hanna uses every day – but Fredrik is unperturbed by the perceived disadvantage. "The secret is not to overthink it," he says. "All those functions sound complicated when you describe it, but actually if you relax it all just sort of flows together naturally."

Fredrik: 1:41.51 minutes

Hanna: 1:45.46 minutes

Result: Hanna 1: Fredrik 2

VICTORY

Fredrik is the overall winner – but it was close – with only four seconds difference in the last challenge.

"Tying the knot was tricky, but actually I found closing the matchbox the hardest," says Fredrik. "The distance from the box made it difficult to get the right perspective, making it hard to get the distance just right."

Hanna agrees: "The EC750E is such a big machine – and the matchbox so tiny!"

The two noble competitors shake hands – but are they still friends?

"No!" they both laugh.

Launch of the new EC950E crawler excavator

The audience grandstand at a Volvo CE event in Braås, Sweden

The massive A60H joins Volvo CE's fleet of articulated haulers

First A60H articulated haulers sold at Bauma

Presidents and CEOs - Martin Lundstedt (left) of Volvo Group with Volvo CE's Martin Weissburg, in Braås, Sweden

The award-winning Co-Pilot featuring Dig Assist

LEGO® Technic builds air-powered mini wheeled excavator

Concept HX1 autonomous, battery-electric load carrier and LX1 prototype electric hybrid wheel loader unveiled at Xploration Forum, Eskilstuna, Sweden

Prototype autonomous wheel loader and articulated hauler unveiled at Xploration Forum, Eskilstuna, Sweden

The Construction Climate Challenge is part of Volvo CE's commitment to WWF´s Climate Savers Program.

WELCOME TO THE CONSTRUCTION INDUSTRY CLIMATE INITIATIVE

The Construction Climate Challenge is hosted by Volvo CE to promote environmental awareness in the construction industry. We aim to create a dialogue between industry representatives, academics and politicians, as well as providing funding for new research and sharing existing knowledge and resources to help the industry make a difference for generations to come.

Volvo CE has long been committed to reducing harmful emissions from its products and facilities. But climate change is too big of an issue to be dealt with through the resources of one company alone. As acknowledged in 1972 by former Volvo Group President and CEO Pehr G. Gyllenhammar: "We are part of the problem – but we are also part of the solution."

Read more about the Construction Climate Challenge here: **constructionclimatechallenge.com**

CONSTRUCTION CLIMATE CHALLENGE™

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