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CAT MAGAZINE

ON LOCATION: GÄLLIVARE, SWEDEN

MAXIMIZING MACHINE LIFE AT -30°C

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INDUSTRIAL DESIGN
The next century starts here

Dear reader,

To ensure business success, you need to be constantly ready to make the most of every opportunity that comes your way. That applies to Caterpillar and our dealers as much as it does to you, our customers. So let's take a look at just a few examples of what we've been up to recently.

Early in 2010 we showcased our Tier 4 Interim/Stage IIIB readiness. Group President Stu Levenick said then: "Our Tier 4 Interim/Stage IIIB products will be delivered with the quality, durability and reliability our customers expect and deserve."

In Europe, we allied with Wacker Neuson SE in Germany for the design, manufacture and support of Cat mini hydraulic excavators in the under three-tonne category, opening new options for customers worldwide.

Other highlights include the acquisition of mining company Bucyrus to expand our offering to the mining community, as well as new large engine manufacturing facilities and significantly increased excavator production capacity in China.

These and other developments have a single aim - to equip Caterpillar and our dealers to optimally support your business growth as the economy expands. In this issue of Cat Magazine, we demonstrate this reality by showcasing a variety of recent customer successes. Enjoy your read!

Paolo Fellin,
Vice president Caterpillar

Above is just a taste of what's in this issue – you'll find plenty more news and views inside. If you have an idea for a story for a future issue, contact our publishers on CatMagazine@cat.com

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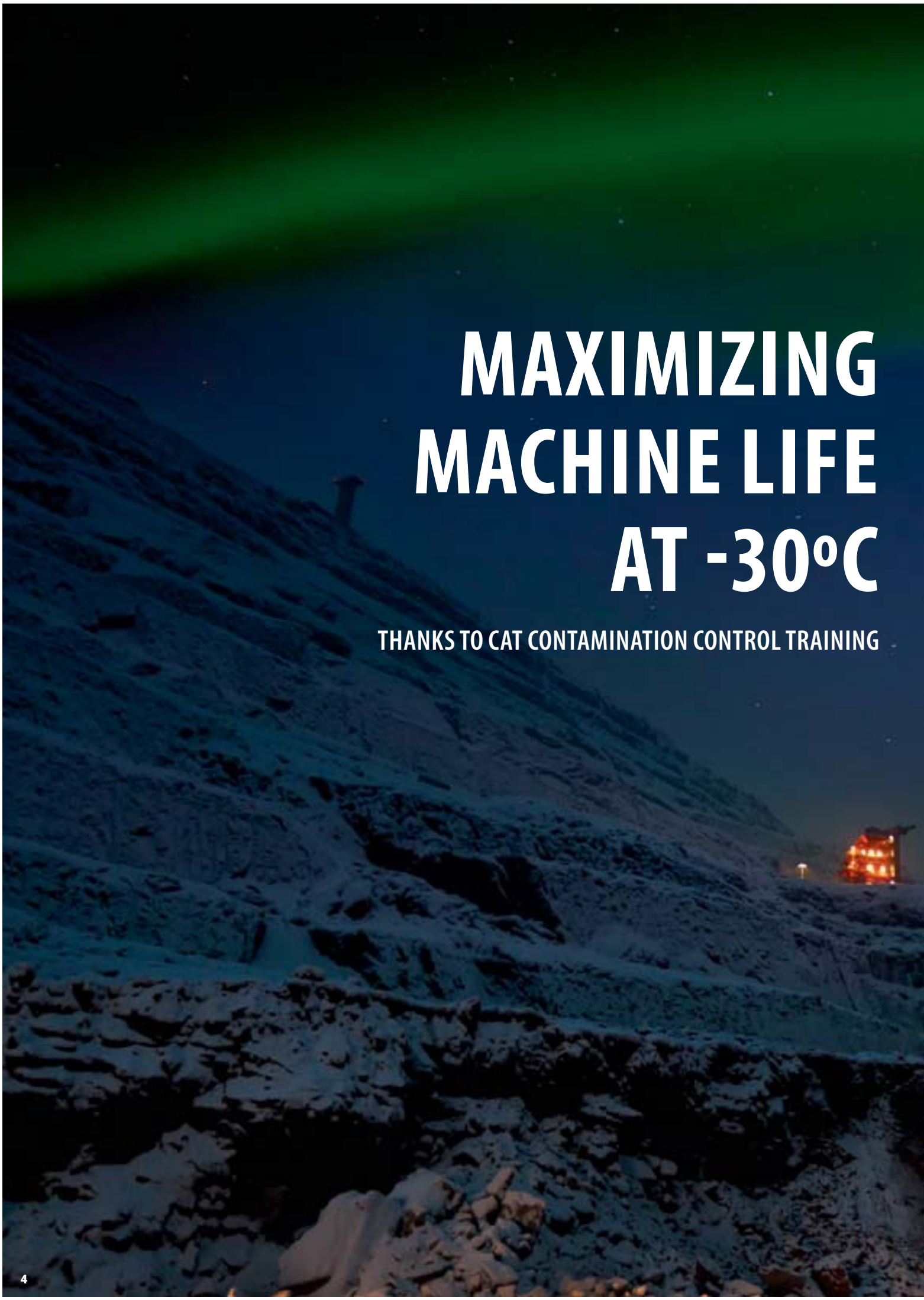


MAXIMIZING MACHINE LIFE AT -30°C

THANKS TO CAT CONTAMINATION CONTROL TRAINING

At the Aitik open pit copper mine, 70km north of the Arctic Circle in Sweden, a fleet of 23 Cat 793 mining trucks plays a key role in delivering a profitable operation under some of the world's toughest conditions. Supporting mine owner Boliden in boosting productivity is a unique training programme for workshop technicians jointly organized by Caterpillar's Global Mining Division, EAME Service Operations team, and local Cat dealer PON. The prize – less downtime, lower maintenance costs, and longer machine life.

"Wow, for sure that's one very big hole," whispers Cat contamination control market professional Ron Meischner to himself. He's looking into the Aitik mine's 3km long, 420 metre deep open pit for the first time. Having conducted training at mines worldwide, he's not easily impressed, but this time it's different. Brought in to support workshop training planned by Caterpillar's Michael Loyer, EAME service operations consultant and Mike Stott, product support rep. in Global Mining, Ron immediately understands the potential for improvement in machine productivity that effective contamination control by trained workshop staff can deliver here.

Michael Loyer agrees. "Good training always pays," he says. "That's why it's considered so important by everyone at Caterpillar. But here the payback could be truly impressive. That's why we're here, to support Boliden's drive for maximum efficiency and assets utilization."

LIFE AT THE LIMIT

Copper ore was first discovered near Gällivare in northern Sweden in the early 1930s. But the low copper concentration – less than 0.5% percent – meant that mining was only considered in the 1960s, when the appropriate equipment and technology for profitable extraction became available. The mine opened in 1968, initially delivering 2 million tonnes of copper ore annually. Now annual production is planned to rise to around 36 million tonnes by 2012, and it's estimated that altogether over 480 million tonnes of waste rock have been removed. That waste now finds use as road reinforcement and as ballast in concrete manufacture.

Production is by drill and blast. Material is loaded onto the Cat 793 mining trucks, each carrying a payload of 218 tonnes (10 Cat 795 electric drive trucks are on order, with the first one complete and a second one currently being assembled on site), and transported to two crushers, one inside the pit itself and one at surface level to reduce truck haulage distance. From there the rock is carried on a 7km belt conveyor system, first to an intermediate stockpile and then to a main ore storage building sited near to the mine's concentrator plant. Grinding and flotation technology separates out the copper concentrate, which is transported by train – roughly 500 tonnes per day – to the Ronnskär copper smelter at Skellefteå, 250km away.

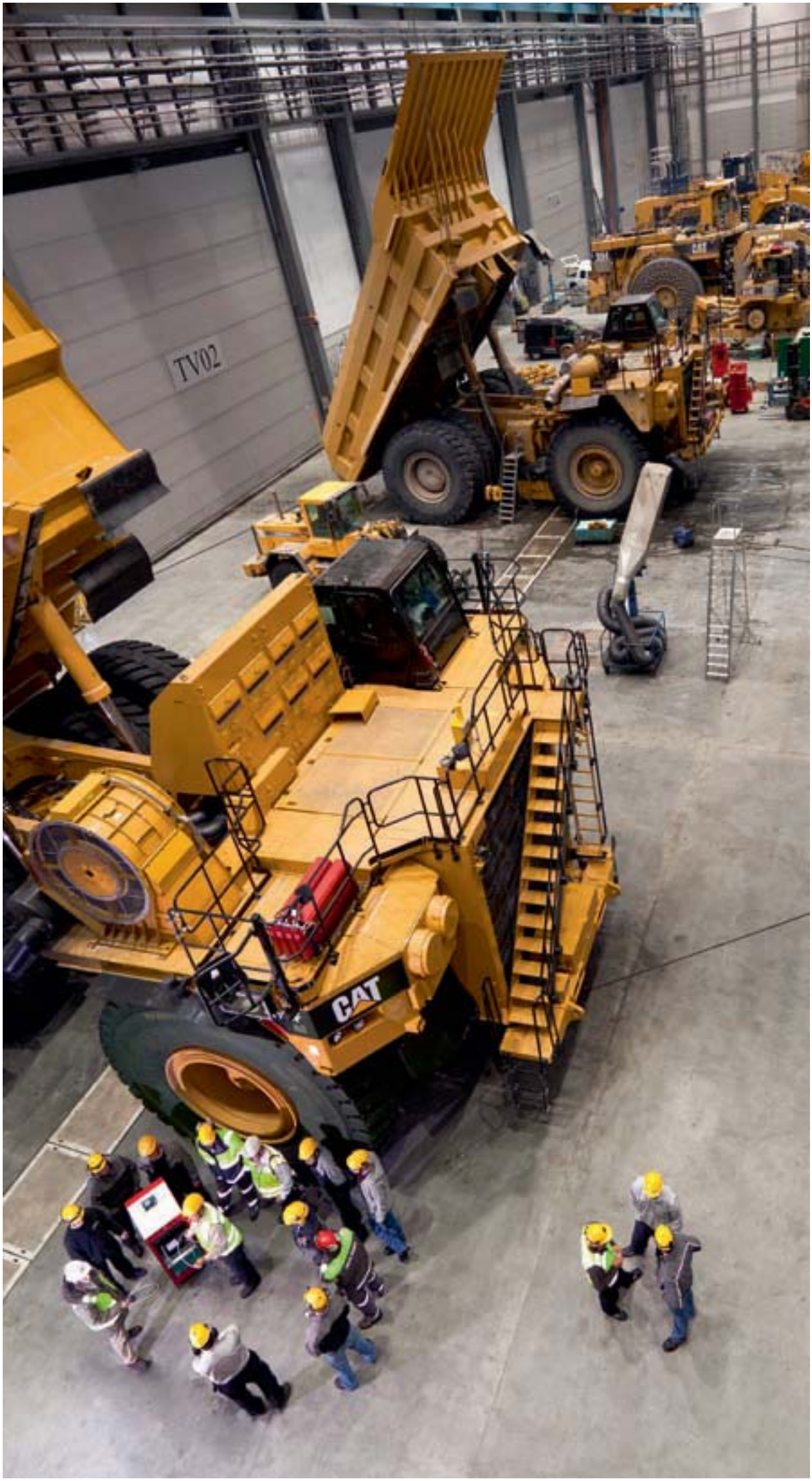
"Production continues 24 hours a day in temperatures that have dropped as low as -47°C in winter and are usually down to -30°C, while in summer they can rise to +30°C," says Anton Matti, Boliden's maintenance planner for mobile machinery. "The Cat trucks also have to operate on haul roads whose frozen surface melts in spring, making hauling on slopes of 8 percent a challenging proposition. In fact," he adds, "everything at the Aitik mine pushes our machines close to their limits."

"Everything at the Aitik mine pushes our machines close to their limits."

More ▸

MICHAEL LOYER
"This is just the beginning of a long term process that will deliver real productivity gains."

VISUALIZING CONTAMINATION
This is how much 'dirt' can be present in a 208 litre drum of oil and still meet the recommended ISO 16/13 cleanliness standard – just 160mg, equivalent to just two baby aspirin tablets.



Caterpillar contamination control expert Ron Meischner, left, conducts practical hands-on training in the Aitik mine workshop.

ARCTIC CLIMATE
Temperatures at the mine can sink to -30ºC, creating challenges even for this Cat 994 (above) and for technicians at the mine's workshop (top).

PRACTICAL TRAINING, REAL WORLD BENEFITS

So how can training in contamination control help, and what does it involve? Michael Loyer's answer is simple: "You have to ask yourself, how often do you change hydraulic oil filters, transmission fluid, axle oil? If you could safely extend the change intervals, what would be the effect on running and maintenance costs? And what if you could extend the life of hydraulic components transmissions, final drives and differentials, and fuel injectors? What could you save? By how much could you improve operating efficiency? The single greatest opportunity for increasing component life and lowering operating costs is to effectively manage fluid cleanliness. And that's what our training session here is about."

Attending are 10 technicians from the 32 staff who man the mine's workshop – a mixture of Boliden employees and technicians from local Cat dealer PON, permanently based at the Aitik mine. Joining them is PON workshop supervisor at the mine, Mats Petterssen, who needs no convincing about the value of the training. "With production at the mine increasing," he states, "we have growing demands placed on us, so we need well trained people. We need to know more, to be able to work more effectively in supporting the company's drive for cost efficiency. This will make a significant difference."

The session consists of presentations clearly explaining the techniques of contamination control and their benefits, plus practical workshop sessions where operations such as particle analysis and kidney looping are demonstrated. But as Ron Meischner explains, "This is only the beginning of a process that will bring increasing benefits as time goes on. We're also doing a workshop assessment, which will give mine management a clear picture of current workshop efficiency, outline what can be done to increase it, suggest a programme to implement the changes, and provide a calculation of the likely benefits in terms of cost saving and improved machine productivity."

THE START OF SOMETHING BIG

"This has been just the beginning of a long term process," adds Michael once the training, workshop assessment and subsequent presentation to Boliden Aitik mine manager Patrik Gillerstedt have been completed. "Recommendations have been made, the outcomes were really positive, and now there's a real commitment from everyone - Boliden, Cat dealer PON, Caterpillar's Global Mining Division and the EAME Service Operations team to collaborate in putting together an action plan that will deliver real machine productivity gains and lower maintenance costs for years to come."

Patrik Gillerstedt adds: "We see the benefits we can get by working with contamination control and we will continue working with PON and Caterpillar to reach an even higher level of cleanliness." ■

>> **Watch our new electric drive trucks in action here**
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GREENING THE DESERT IN OMAN

Using a centuries-old technique adapted to meet today's needs, oil company Petroleum Development Oman is committed to cleaning and recycling huge volumes of contaminated water from its oil production process – and Cat machines are right there, providing the muscle needed to make the desert bloom.

Ten years ago at Nimr, 800km south-west of the country's capital city of Muscat, only a lonely oil production facility interrupted the monotony of the desert landscape. But now that's all changed. Where once only rock, gravel and sand baked in summer temperatures up to 55ºC, now enormous beds of reeds sway in the desert wind and the sound of running water is heard. It's all part of an ambitious project initiated by oil company Petroleum Development Oman (PDO). Undertaken by environmental specialist Bauer Nimr LLC, the project is aimed at cleaning and recycling contaminated water resulting from the process of oil extraction at the Nimr site. And a large fleet of Cat machines operated by Oman's Sarooj Construction Company have been playing a vital role in the initial construction phase of the project.

A TRADITIONAL SOLUTION TO A MODERN PROBLEM

It is a little known fact outside the oil industry that oil rarely rises to the surface from a well by itself. As soon as the pressure inside a newly opened up reservoir declines, water is injected in order to propel the oil to the surface. At current oil price levels, even water contents of up to 90 percent are considered to be economical.

In the Nimr oil field only a tenth of total production is pure crude oil. Six barrels of saline process water are produced along with every barrel of oil. Along with salt, this water contains oil residues, plus some heavy metals. In all, around 250,000 cubic metres of contaminated water are generated daily. Until now, following recovery of as much of the oil content as possible, the water has been disposed of through deep water disposal wells. It's an expensive process that consumes an enormous amount of energy, so it's not surprising that for a long time PDO has been considering how the contaminated water might instead be treated in a more environmentally friendly and energy-efficient way.

At first sight the solution seems to be a strange one – a reed bed treatment plant using locally grown reed plants. But it's a proven technology with a history dating back to the middle ages, when water coming into a village was routed through swamps, which cleaned it. The technique was re-invented in the 1970s, when constructed reed bed systems began to be used for sewage treatment and salt-water cleaning.

A pilot reed-based wetland treatment system was constructed by PDO in 2000 to investigate its ability to remove residual oils and heavy metals from the water passing through it. Over a period of six years it demonstrated the viability of the concept and in 2007 Bauer Nimr LLC, a subsidiary of the Bauer Group, was appointed to develop the reed-bed technology so that the entire volume of process water produced by the Nimr production facility could be treated.

Based on the four-stage pilot plant, the final system will also be able to remove any dissolved and residual matter in the water. What will remain is clean water, which can also be used for agricultural irrigation. But

When complete the reed bed treatment plant will cover a total of 235 hectares.

that's not all: when cut the reeds can be used as a source of energy, for example, generating electricity. And salt produced in evaporation ponds that are part of the design will be available to be used as lubricant on the drill heads during further drilling.

You need very little power to operate a reed bed system, because its design allows water to cascade through it naturally; but you do need a lot of land. When complete, the actual reed bed treatment plant will be more than 150 times larger than the test field, covering a total area of 235 hectares – equivalent to around 450 football pitches.

The project consists of three phases. The first phase covers an area of 171,000m^2, where water goes through a filtration process to remove 99 percent of the oil. Then the water flows into a buffer pond 1.8km x 54m in area. Phase 2 consists of the reed beds themselves, covering an area of 2,340,000m^2. Phase 3 is the evaporation/salt fields – an area of 2,819,100m^2.

More ▸

The work involves cutting and moving 700,000m³ of hard rock.

"Machine availability is a key factor in meeting schedules."

HOW TO MOVE A MILLION CUBIC METRES - FAST

That was the problem facing Sarooj Construction Company when they began work on the project in May 2009. The work involves cutting and moving 1,000,000m^3 of material, 700,000m^3 of which consists of hard rock, in order to level a total area of about 6,000,000m^3. After levelling the whole area has to be graded, rolled and compacted to a tolerance of less than 2cm over the whole area. Following this around 1,000,000m^3 of laterite needs to be produced, mixed and placed on the whole area in order to create an impermeable layer that will prevent water loss in the plant. The numbers are impressive and the workload high, so it's no surprise to discover that Sarooj has turned to a whole range of Cat machines to ensure the job gets done efficiently. Oasis, part of regional Cat dealership group Al-Bahar, was instrumental in specifying machines to match the work to be done, and is also providing round-the-clock after sales support. At least seven Cat excavators with rock breakers have been working day and night to achieve the levelling, with two 14M Cat graders and rollers equipped with AccuGrade GPS systems put to work to achieve the tight tolerance levels. The contractor has a total of 73 of its own machines on site, of which 50 are Cat machines, with further Cat machines hired as and when needed.

Sarooj project manager Marc Brijs says: "Turning to Cat has turned out to be a good decision for us on this project. The Cat machines have much less downtime than other machines and, in an environment where dust is a challenge to the equipment, spare parts are available faster. That's a big plus. And interestingly," he adds, "based on our experience on site, we now have figures that demonstrate that when you have a dedicated driver to one machine, there's up to 50 percent less breakdowns and downtime with that equipment. So that's what we try to do whenever possible. We have operators working 10 hour shifts here – and sometimes longer – so machine availability's a key factor in meeting schedules."

In order to maximize uptime, Sarooj has an independent workshop on-site, where a team of 26 technicians undertake preventive maintenance and repair.

"We like to think that, all in all, we run an efficient operation here," confirms Marc, "although I have to admit that at first that wasn't always the case. When I first started here, I had to go back to basics and plan and calculate everything in order to make the operation efficient – how many machines we needed, where and when. But now everyone working here has his own position and responsibilities well defined. We work in autonomous teams, which helps motivate our workers. There's even a bit of competition between the teams, and the best performers get a bonus. Along with the productivity of our Cat machines, it all helps us keep up to speed on a demanding site."

AN INVESTMENT IN SUSTAINABILITY

What of the future? When completed, the Nimr reed bed water treatment plant will be the largest commercial reed bed water treatment plant in the world. It will save not only an enormous amount of energy and real money in years to come, but of course also CO_2.

Reeds will grow almost anywhere and the energy consumption for the effluent is almost zero. As a result, the project is ground-breaking for the management of production water in the oil industry, which is primarily located in desert areas, and of course for many other applications as well. Reed bed treatment plants can be used to treat the domestic effluent of entire towns. The small states and emirates of the Middle East, in particular, are already investing in innovative products and techniques in the area of ecology – they are preparing for the period after the oil has run out. ■

Operators work 10 hour shifts and, where possible, are dedicated to one machine, helping reduce breakdowns and downtime.

Working in autonomous teams helps motivation and increases machine productivity on a demanding site.

>> **Learn more about our motor graders here**
www.uk.cat.com/MG

THE NEXT CENTURY STARTS HERE

Ashley Menges, senior designer at Caterpillar corporate industrial design, discusses some aspects of the development of this revolutionary machine and reveals the thinking that led to its genesis.

ASHLEY MENGES
senior designer at Caterpillar corporate industrial design.

A preliminary sketch for the D7E highlights a new approach to cab design offering substantially improved ergonomics.

Switching from designing exercise equipment to developing future generations of Cat machines seems like an unlikely career move. But not to Caterpillar senior designer Ashley Menges. It's precisely the move he made nine years ago, and he insists that it was a logical step. "In fact it's not as big a change as you'd think," he says. "Both jobs involve the integration of ergonomics and styling – finding the best possible mix of form and usability. My primary commitment here at Caterpillar, whatever project I'm working on, is to discover and apply that mix – the combination of function, serviceability and physical design that will deliver the best possible productivity at the jobsite."

For Ashley the commitment began early. "I always wanted to be a designer," he confesses, "right from when I was a little boy. My main preoccupations then were taking things apart to see how they worked, and drawing. And the combination of these two things still fascinates me; it's the basis of being a designer."

These days he works mostly on a computer screen, but the fascination remains. "My time's divided between current product development," he states, "and 'blue sky' forward thinking; taking a look at what could be without the limitations imposed by today's technology. But even when I'm working on current product development I'll always try to look at a blue sky alternative, since it will often be possible to incorporate some of that thinking into an ongoing project." He points to the cab design on the Cat D7E as an example.

A POINTER TO TOMORROW

Although development work on the Cat D7E started in the late 1990s, Ashley sees the machine as an indicator of future directions in design. As he says: "The next century starts here. The shift to electric drive, for instance, provides significant benefits compared

"The D7E has shown us a way we might go with other machines in future."

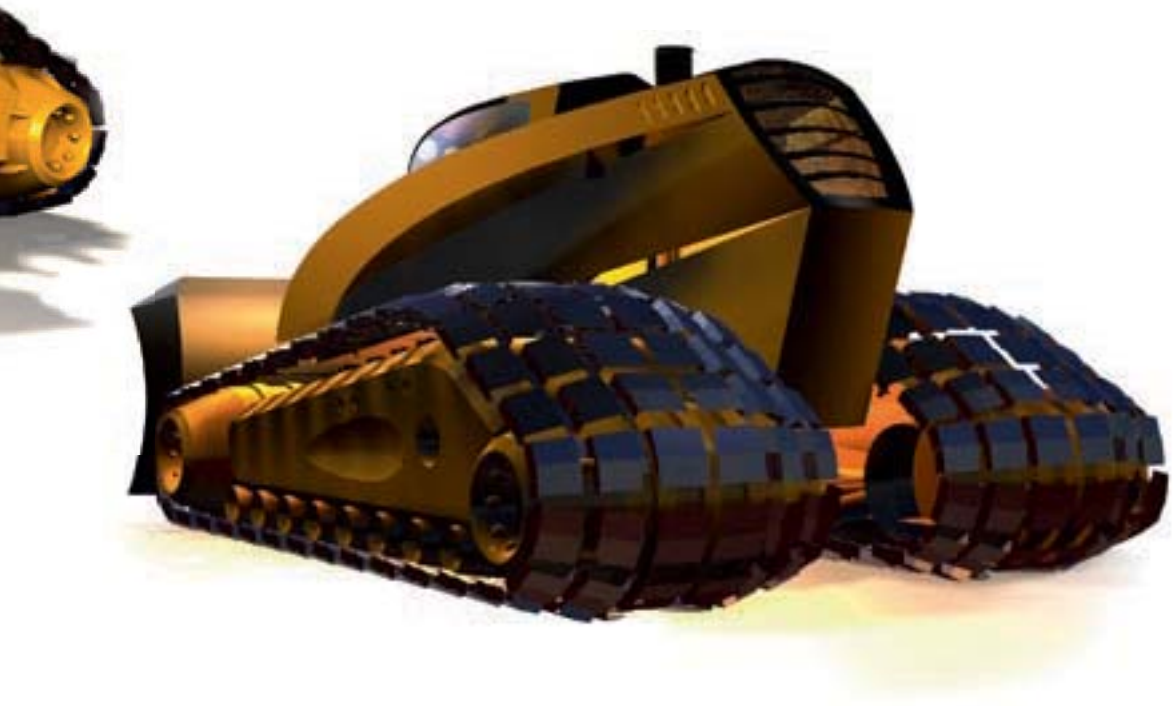
to mechanical transmission; like five percent more material moved per litre of fuel, 10 to 30 percent less fuel consumed per hour, 50 percent less noise, and 50 percent longer drive train life. It's shown us a way we might go with other machines in future."

Electric drive technology, he acknowledges, isn't really new: "It's been in use for more than 50 years in train locomotives, and more recently in hybrid cars. But its application to a track type tractor takes a leap in the imagination that isn't easy to make. But now that it's done, of course, people say, 'That's so simple, why didn't I think of it?'. Well, luckily at Caterpillar we did."

That's not to say that the D7E is lacking in innovation. From the laser cutting of its sheet metal to the cab design, the machine breaks new ground.

purely from what's needed for efficient operating. You ask questions like 'What visibility's needed, at what angles?', and the answers give you the basis for your design.

"Mind you," he adds, "when design proposals first got shown to users, we had some negative reactions, particularly to the single central screen post. But once we explained the reasoning – that operators need to look constantly at the edges of the blade – understanding comes and the enthusiasm grows."



What comes next? Following on from today's innovative Cat D7E, tomorrow's track-type tractor could look radically different.

Computer simulation - and the final cab.

Starting point for future innovation – the new Cat D7E in action.

ASK THE EXPERTS

"My main concerns have been with the look of the machine and with cab design," says Ashley. "I wanted to make the D7E stand out visually as well as under the hood. There are always problems of perception in that kind of exercise, like there have been with the hybrid car. Should it look conventional? Or should it announce that it's something new by looking radically different? I'm not sure they've got it right with hybrid cars, but with the D7E I think we've done OK; or so our customers are telling us, and they're the real experts."

Customers were also closely consulted over cab design. "It may look a little radical," Ashley admits, "but that comes

This kind of consultation went on throughout the design process. And the end result, concludes Ashley, is a machine with incredible potential, one that will become a benchmark for future design innovations. "Tomorrow starts here," he says. "Perhaps next we'll move on to designs that feature concepts such as fully integrated track, a movable cab for optimum visibility with maximum safety, and maybe even remote control." ■

>> **Learn more about our new Cat D7E electric drive tractor here**
www.cat.com/D7E

>> **Learn more about our track type tractors here**
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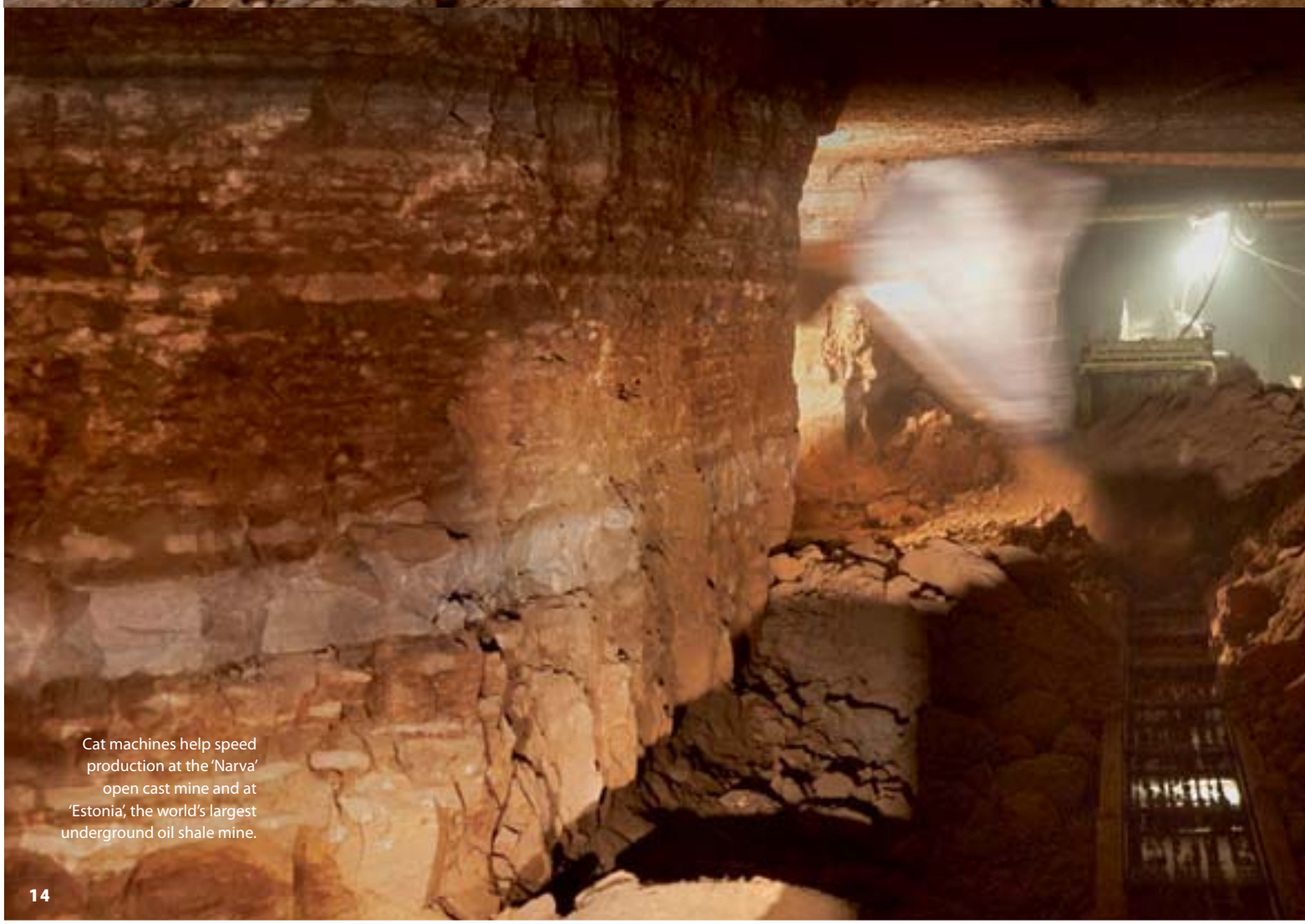

Cat machines help speed production at the 'Narva' open cast mine and at 'Estonia', the world's largest underground oil shale mine.

HOW CAT EQUIPMENT HELPS POWER ESTONIA

VINNING ENERGY FROM THE EARTH

At the start of the last century an Estonian farmer decided to build a sauna. On his land he found the ideal stone – strong enough, but easy to cut. Once it was built, he lit the stove and prepared to enjoy his first sauna. But then he noticed that the fire had spread from his stove to the walls. He fled, his enjoyment – and his sauna – ruined. But he had instead found fame as the discoverer of oil shale in Estonia. His discovery led to the arrival of teams of geologists, who found sizable deposits – and in 1916 mining on an industrial scale began.

Now, almost 100 years later, oil shale is an important resource. Estonia generates 90% of its power from this source, the oil shale industry employs 7,500 people, and accounts for four percent of Estonia's gross domestic product. And naturally Cat machines are there, speeding the mining, moving and mixing of this important material.

ENERGY FOR ALL

The Eesti Energia Group is one of the largest energy companies in the Baltic region, supplying electricity to industrial, commercial and domestic users. The group is involved right along the value chain, from oil shale mining to electricity generation, distribution and sales, as well as in heat production and the production of oil from oil shale. The group's mining company, Eesti Energia Kaevandused, operates two surface mines and two underground mines, including the 'Estonia' mine, the world's largest underground oil shale mine. Around 80 percent of total annual production goes for power generation, with 18 percent processed for oil generation and 2 percent used in cement manufacture.

The company is a committed user of Cat machines and equipment, supplied by local Cat dealer Wihuri AS. In three mines the company currently operates five Cat D11 track type tractors, four 16H motor graders, two 988H wheel loaders and a 444E backhoe loader. Most of the machines are at work in 'Narva' open cast mine, but one 16H motor grader is in use at the Aidu open cast mine and one 16H in the 'Estonia' mine.

More ▸

Local Cat dealer Wihuri AS mechanic Vladislav Lahno, based on-site at the 'Narva' mine.

Cat 988H wheel loaders (above) and 16H motor graders play an essential role in building and maintaining 150km of haul roads.

UNBEATABLE VERSATILITY

"Our decision to invest in Cat machines began in 1989," says Eesti Energia Kaevandused technical and service manager Erkki Kaisla. "We rented a Cat D11R from Wihuri AS, put it on test for a year and found it was a productive, reliable performer. It also became clear that, at the 'Narva' mine, it was an incredibly versatile machine. And it's proved to be so ever since. The five D11s that we currently operate are involved in over 30 operations, from overburden and excavation works to operations on the oil shale stockpile and land restoration."

Pavel Onuchak, production manager at 'Narva', agrees: "Testing proved that we could use the D11 to rip the oil shale layer before it's removed by draglines, rather than having to blast. And in addition we employ our D11s in other critical operations. Draglines take most of the oil shale from thicker seams, but the dozers take what the draglines can't get. The D11s also prepare roads for the draglines and prepare blasting areas. They have also built over 150km of haul roads. Of course" he adds, "their fuel consumption varies depending on the type of work. Highest fuel use is at the stockpile where the dozers are used to mix the shale to ensure consistent calorific value. That's tough work, as is the job they do on land reclamation, which plays an important role in our work."

CAT SERVICE – THE CRITICAL FACTOR

With over 500 machines of various types in use at four sites, and with a commitment to unbroken year-round production, it's not surprising that service is crucial at Eesti Energia Kaevandused. The company's repair and maintenance analyst,

Einar Kivimäe, says: "We aim to achieve optimum equipment lifetime, and service is integral to that process. That's why we employ 100 service people."

Service of the Cat machines at 'Narva', however, is the responsibility of Cat dealer Wihuri AS. "We have one mechanic permanently on site," says Wihuri key account manager Magnus Mägedi, "plus two mobile technicians available at extremely short notice whenever they're needed. Most servicing is done on site, with major overhauls being done at the dealership."

Site-based Wihuri mechanic Vladislav Lahno adds: "With four 16H motor graders working on road construction

"Our Cat dealer service people do a valuable job in keeping us productive."

and maintenance, plus two 988H wheel loaders, and five D11 track type tractors each clocking up around 5,000 hours per year, there's certainly enough work to keep me and my mobile colleagues busy. But we don't see any particular problems, even though conditions are tough and temperatures can vary between -25ºC and +35ºC. The Cat machines perform very reliably."

Production Manager Pavel Onuchak agrees: "We like Cat particularly for its good service. They are very well qualified, well organised people who do a valuable job in keeping us productive."

TESTING, TESTING

Oil shale production in eastern Estonia will continue for at least another 30 years, so Cat involvement looks certain to stay at a high level – and could even increase. Currently the company uses a substantial fleet of non-Cat off-road trucks, but for the past year a rented Cat 775 quarry truck has been on test at the site. Says Pavel Onuchak: "Eventually we aim to move up to a bigger truck than the ones we use now. Certainly the Cat truck has better ergonomics and is more reliable. Operators like it because it is more comfortable and can move more. Currently the economics are not quite right, but in future, who knows?" ■

A rented Cat 775 quarry truck on test at the 'Narva' site undergoes maintenance: "Operators like it because it is more comfortable and can move more."

PAVEL ONUCHAK,
production manager at the 'Narva' open cast mine.

MAINTENANCE AND OPERATOR TIPS

BATTERIES

Regular battery maintenance helps keep your equipment running. On the other hand, a dead battery means unscheduled downtime, decreased productivity and lower profits. We know your battery won't last forever, but following these simple battery maintenance techniques will help you maximize its life.

STORAGE AND STOCK ROTATION

1. STORE BATTERIES IN A COOL, DRY AREA

Keep them in an upright position and keep them from freezing for maximum life. Heat will discharge batteries quickly and they must be kept away from ceiling heat.

2. DON'T STACK BATTERIES MORE THAN TWO HIGH

Additionally, never stack batteries directly on top of each other unless they are in cartons or on pallets protected by corrugated packaging.

3. ROTATE YOUR STOCK

As batteries age, they become discharged. To avoid keeping batteries in stock for too long, make sure you use first-in first-out (FIFO) methodology.

4. DISCONNECT BATTERY CABLES

For storage periods of four weeks or more, battery cables should always be disconnected, otherwise in cold weather your batteries may discharge and freeze.

5. REMOVE THE BATTERY

If you store your machine in an unheated area in winter, remove the battery and store it in a room with a constant 5-10°C temperature.

6. TEST BEFORE INSTALLATION

New batteries will measure 12.6 volts or more, but voltage drops with long storage. If a battery drops below 12.4 volts always charge it before use.

BATTERY CHARGING TIPS

1. FOLLOW SAFETY PRECAUTIONS

Always follow safety precautions, wear proper eye protection, and be sure to read the manufacturer's instructions.

2. MAKE SURE CHARGER IS OFF PRIOR TO HOOK UP

The charger should be turned off and the battery disconnected before undertaking charging.

3. DO NOT CHARGE A FROZEN BATTERY

Always allow it to warm first.

4. USE A SLOW CHARGE

With a fast charge you risk overheating the battery, which can boil out the water and buckle the plates. If violent gassing or spewing of liquid occurs or the case feels hot, reduce or halt charging.

5. ENSURE MINIMUM CHARGE CURRENT IS ACCEPTED

If a battery fails to accept minimum charging current within 15 minutes at the highest charger setting it should be replaced.

REPLACEMENT BATTERIES – A FAST, DEPENDABLE SERVICE

CUSTOM TRACK SERVICE

When you need a replacement battery for your machine, your Cat dealer carries replacements and can install them in his shop or in the field. The Cat warranty program ensures that you get maximum life from your battery, or your dealer will replace it free of charge.

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DELIVERY ON DEMAND

TO BRING YOU BETTER SERVICE, CAT DIFFERENTIATED LIQUID FILTERS ARE NOW EVEN MORE READILY AVAILABLE.

Advanced Filtration Systems Incorporated (AFSI), maker of Cat differentiated liquid filters, has recently opened a new manufacturing facility near the city of Most in North Bohemia, Czech Republic. The new European facility means the company is now able to better serve Caterpillar customers throughout Europe, Africa, and the Middle East.

AFSI was established back in 1986 in the USA as a joint venture of Caterpillar and Donaldson, a long-time specialist in the manufacturer of filtration and exhaust systems. The company manufactures filters exclusively for Caterpillar and Perkins.

As well as the Czech facility, opened in March last year, AFSI continues to produce differentiated liquid filters at its plant in the city of Champaign, Illinois, USA. Currently the company supplies approximately 80 percent of Caterpillar's liquid engine filtration product needs. Europe, Africa and the Middle East accounts for around 30 percent of total worldwide Caterpillar and customer demand.

"A decision to establish a European branch came in 2007 as the plant in Champaign was reaching its maximum capacity. A European location, for additional capacity, was chosen to better and faster serve the markets in Europe, Africa, and the Middle East. It will also help to serve the needs of Asia and Australia," explains Ebban Clause, Marketing Consultant at Caterpillar.

FASTER REPLENISHMENT TIMES

The Czech factory was officially inaugurated on the 19th of March 2010 after a soft start to production in 2009. The Czech factory has been built to meet total demand for Europe, Africa and Asia, with the Champaign facility continuing to provide filters for North and South America. While it used to take 45 days to ship parts from the USA to Europe in order to replenish stock, now – thanks to the Czech facility – replenishment time has been reduced to less than a week, ensuring even more effective and secure delivery to end users.

AFSI filters are used in oil filtration (both engine and hydraulic), fuel filtration, and water separation systems of Caterpillar and Perkins products, and are well-known for meeting high quality and functionality requirements, even under heavy-duty applications and difficult conditions. Specific features of the AFSI filters are the use of non-metallic center tubes with higher rigidity than their metal counterparts; polyurethane end caps to eliminate leak paths; media pleat stability features to maintain pleat separation and retain particles; and aluminum top plates for improved component cleanliness. This results in a compact filter cartridge that eliminates the risk of metal particles being released into the filtered liquids, minimizing the danger of potential impurities causing damage to critical machine/engine components. ■

The new AFSI factory in the Czech Republic.

AFSI filters meet high quality and functionality requirements, even in heavy duty applications.

>> **For more information about our filters, click on the following link**
www.uk.cat.com/filters

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