

tractuell

The TRACTO-TECHNIK customer magazine 



**YOU WON'T EVEN NOTICE
THAT WE'VE BEEN THERE!**



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MASTERING STEEP SLOPES IN THE BRAND VALLEY

Installation of a horizontal well with GRUNDODRILL^{18ACS} in the eastern Alps

The idyllic community of Brand, with its 700 inhabitants, is located at an altitude of about 1000 m at the end of the Brandnertal valley and occupies a position at the base of the Schesaplana massif (2965 m) and in the heart of the Rätikon mountain range. The Brandnertal valley borders the Montafon valley in the east and the Swiss Canton of Grisons in the south-west. It officially belongs to the Austrian state of Vorarlberg. Since it was first settled in the 14th century by 12 Walser families from the Swiss canton of Valais, this beautiful

corner of the world flanked by the eastern Alps has had an interesting history. Brand was first mentioned in official records in 1347. The first tourists started arriving in the Brandnertal Valley in the mid-19th-century as Alpine tourism started to increase in popularity, accompanied by the building of mountain huts and the establishment of hiking paths.

Since 1990, development of the infrastructure for summer and winter tourism has been increasing

all the time. Today the community of Brand welcomes 160,000 tourists in the winter and 105,000 in the summer.

TRENCHLESS WAS THE ONLY WAY TO GO

The Glingabrunnen Springs located to the south-west of Brand in the Zalimtal valley (around 1280 – 1330 metres above sea level) are one of the most impressive natural attractions in Vorarlberg. They consist of a number of springs which are fed directly by the Brandner Glacier from underground streams, with the water ultimately bubbling forth out of the ground at the Glingabrunnen Springs. The community made the decision to install three pipelines made of PE 100-RC (RC = high resistance to crack), ND 125, in order to obtain water for drinking and power generation purposes as well as to supply the reservoir of a snowmaking system. As a result, there was a need for highly advanced technology to make an appearance in the immediate vicinity of this romantic natural attraction. The length of the respective bores was calculated at around 115 m each. Since open excavation methods would have been impossible in the rocky and steep terrain, after careful

consideration the planners at Sutterlütti Geological Consultants suggested to the contractor – the Plankel Bohrungen company from Wolfurt in Vorarlberg – that trenchless installation using the HDD fluid-assisted drilling method should be applied.

A JOB FOR THE SPECIALISTS

It very quickly became apparent that the job was not going to be an everyday affair: both the positioning of the bores in rugged, steep terrain and the difficult geological conditions necessitated a large amount of expertise, dexterity and foresightedness. It was also clear right from the beginning that only a HDD rock drilling system could be used here. The GRUNDODRILL^{18ACS} was the obvious choice as this system was specially developed for this type of geology. The Plankel company received support with planning and execution from the experts of the specialised civil engineering department (STS) of TRACTO-TECHNIK. Their expertise was needed even before the start of the engineering project and René Schriener, a HDD rock drilling specialist, travelled to the still snow-covered Brandertal Valley in the

spring for an extensive preliminary assessment. "These types of difficult and demanding jobs are exactly what we like because they let us show what our drilling technology is really capable of," says a proud René Schrinner.

After the plan for all three pipelines had been completed with the HDD-Quick-Planner and the drilling tools and composition of the drilling fluid had been decided upon, construction was finally able to start in May. Even setting up the construction site proved to be very complicated: new pathways had to be built, stream crossings had to be put in place and a drilling site with a 25 % slope had to be excavated - a task which was masterfully carried out by the employees of the Erdbau Bitschi company from Brand. The pathways available to the team were a very tight fit for bringing in the machinery and equipment, with lots of bends and a number of hazardous spots. Nevertheless, the "helmsman" of the TRACTO-TECHNIK transport truck once again demonstrated what he is capable of getting the job done. The geological conditions on site, i.e. the subsoil, proved to be just as complicated: groundwater,

rough materials like debris, coarse boulder-like objects in the soil as well as rock and moraine deposits presented a real test to the limit for man and machine. For the specialists of TRACTO-TECHNIK and Plankel Bohrungen GmbH, it was an almost irresistible challenge.

IDEAL FOR THE GRUNDODRILL^{18ACS}

Naturally, the space available and the geology at the Glingabrunnen Springs were the key factors in the choice of machinery. No other drilling system is better suited to this type of ground made up of rockfall, scree and boulder debris than the GRUNDODRILL^{18ACS} (All Condition System). Even the rock drill head, a 6 1/2" PDC drilling chisel (= 165 mm diameter) was chosen quite deliberately: compared to a roller chisel, its rate of advance is two to three times faster, it can be controlled more effectively due to its method of cutting and it does not slip off as quickly when drilling directly into bedrock. It is driven forward by a twin-tube rod system. A suspension consisting of biopolymer was used for the drilling fluid - as a cutting and delivery

THESE DIFFICULT
AND DEMANDING JOBS LET
US SHOW WHAT OUR
DRILLING TECHNOLOGY
IS REALLY CAPABLE OF!"

RENÉ SCHRINNER

medium, lubricant, coolant and drilling hole stabiliser. This drilling fluid was specially mixed up in advance by the Phrikolat company.

ROCK DRILL HEAD DOES THE WHOLE JOB

Everything was now in place for the first of three directional pilot bores with a diameter of 165 mm, which started in extremely steep terrain at the top with an entry angle of 67 % and, just as planned, finished at the bottom with an exit angle of 3% to 4% after around 115 m and 38 drilling rods. Relative to the entry point, the bore reached a depth of almost 20 m with a bending radius of approx. 150 m. The drive force from the internal rod to the drilling chisel was 1400 Nm on the inside and 3000 Nm on the outside on average, with an average pushing/pulling force of 59 kN to 118 kN and a flushing rate of 80 l/min.

In this case, there was no need to make the up-sizing bore which usually follows after the pilot bore because the selected drilling diameter of 165 mm was large enough for the PE 100-RC pipe with ND 125 that was being installed. This meant that the butt-welded, perforated PE 100-RC pipe could be installed immediately after the pilot bore, which was completed in one day. To do so, it was prepared at the exit end, attached to a backreamer of dia.160mm and gradually pulled into the drilling channel. Despite the virtually impassable, steep and confusing terrain, it took the specialists operating the

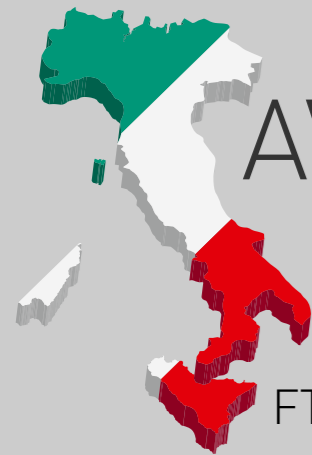
GRUNDODRILL^{18ACS} only three hours to complete this.

MASSIVE SATISFACTION ALL ROUND

Only 13 days elapsed from the start of the job with the complex task of setting up the construction site through to the end of the entire operation (three parallel HDD bores of around 115 m each). Everything went according to plan and with optimal results despite some really limiting conditions. For the community of Brand, whose most important source of income is tourism, the installation of the pipelines will make an important contribution to the economic development of the Brandnertal valley. This applies, in particular, to the possibility of providing fresh water for the snowmaking machine, as this will ensure an enjoyable skiing experience for skiing tourists even in milder winters.

"The managing director of Plankel, Lothar Gunz, was so delighted with the final installation of the pipes that he invited us to a meal together with the Mayor of Brand in order to express his gratitude", explains Hubertus Gödecke from STS, who guided the GRUNDODRILL^{18ACS} through the difficult terrain. Gunter Lehmann, who carried out the complex detection tasks, and everyone else involved were equally delighted that the trenchless pipe installation was carried out so successfully despite the extremely difficult conditions. ♦





AVANTI GRUNDOMAT!

Italian telecoms giant approves of trenchless FTTH connections



SIRTI AG is one of Italy's largest telecommunications corporations. Steeped in tradition, this company played a major role in constructing the Italian telephone network in the 1920s and has since developed into a multinational industry giant. Sustainability and innovation were and are the driving forces behind the company.

Today, SIRTI is active in all areas relating to energy and data infrastructure and one of its key areas of focus is the expansion of the optical fibre network. The scope of their involvement is impressive with 500,000 connections installed every year for domestic users alone. With these quantities in play, fast

and environmentally friendly trenchless installation is the ideal solution and the GRUNDOMAT was thus chosen for the task.

In a residential area located in the city of Verona in northern Italy, the company was tasked with installing five new optical fibre connections from a cen-

tral junction box point to individual private residences. The line corridors run under narrow footpaths between the houses, meaning that open excavation methods would have been too disruptive and complicated. A particular difficulty was the fact that the lines run "around the corner". All in all - the perfect task for the GRUNDOMAT.

For the first 25 m section, a small pit of 1.70 x 0.60 cm was all that was needed to get the GRUNDOMAT^{65P} underway. Once the soil displacement hammer had been aligned, the process was very quick. The four attached FTTH mini-pipes were drawn into an intermediate pit located 15 m away

at a speed of 3 - 5 metres per minute. This intermediate pit was needed because the bore path ran from there into the cellar of the building at a 90° angle. The last 10 m were also bridged without issue and everyone involved was impressed by the speed and accuracy of the GRUNDOMAT. ♦

DRILLING IN PROTECTED LANDSCAPES

Cable Installation in Schleimünde

Author: A. zu Eulenburg
Photographs: Paasch

Contrary to the original plan, the cable in the mole had to be installed using a conventional open trench.



When it comes to line installation in ecologically highly sensitive environments, it is usually a job predestined for the horizontal drilling technology. This was also the case when a new wiring for the lighthouse of Schleimünde was required.

The job site is approached by ship; Schleimünde is normally impossible to reach with land-based means of transportation. The northern German peninsula situated in the Schleswig-Flensburg district separates the river Schlei from the Baltic Sea. The area covering 112 hectares is predominantly a nature reserve and bird sanctuary, it is prohibited to enter it and there are no public roads. In the summer months, the harbour of refuge at the tongue of the peninsula is popular with yachtsmen and people with sports boats alike. The 14 metres high lighthouse, built at the end of a mole in 1871, is used by ships and water sports enthusiasts for orientation.

NEW CABLES FOR THE LIGHTHOUSE

"This lighthouse needed renovation", Jürgen Wilhoeft explained; he works for the responsible water and shipping authorities Lübeck, the federal agency in charge of safety and facility of navigation and, in this case, the mole and sea marks. Within the bounds of the elaborate project, updating the technical facilities and renovating the facade of the lighthouse, the old cables providing the power and data for the light beacon also had to be replaced.

The existing cable path starts from a distribution station and takes course along the property of the "Lighthouse Foundation". This foundation, bent on the sustainable development of seas and oceans, had originally purchased the area with its buildings belonging to the federation at a public property auction in 2008. Only the distribution station and the mole remained in the possession of the federation. In view of future accessibility, the new path leaves the distribution station taking

the shortest possible way and runs beneath the shore protection covered with large rocks on public grounds at the seaside, in parallel with the water's fringe, to a cable manhole at the foot of the mole. From here, one cable string leads to the lighthouse at the tip of the mole and another to a distribution manhole at the harbour.

In the planning phase, the water and shipping authorities attached greatest importance on avoiding any greater interference with the sensitive

„THIS LIGHTHOUSE NEEDED RENOVATION!“

Jürgen Wilhoeft, responsible water and shipping authorities Lübeck

ecology in the course of the building measure. To obtain the required permits from the nature conservation authorities, the trenchless, fluid-assisted horizontal drilling technique was chosen. The closed breeding season for the birds ruled out any other time for the installation than the months

of autumn/winter. "Actually, that is the time when you shouldn't be building anything here because of the weather", Jürgen Wilhoeft told us.

DIFFICULT MARGINAL CONDITIONS

There was a public call for tender for this installation measure and the company Paasch Rohrleitungsbau from Damendorf in Schleswig-Holstein, having submitted the most cost-effective offer, received the commission.

Given the marginal conditions, a reliable calculation of the costs for this measure posed quite a challenge for the tenderers. The transportation of the drill rig and job-site equipment through the nature sanctuary with all the required permits, the restrictions of material and machinery transport to the job-site, the specific properties of the building ground, the provision with soft water for mixing the drilling fluid and the disposal of the used suspension, all these factors were heavily laden with uncertainties and therefore hard to evaluate monetarily. In this case, Paasch had an advantage over the other competitors joining the bidding because the company had formerly drill-



The target pit in the mole while the pipe was pulled in.



The restored surface on the mole.



With tractor support: transporting the drill truck through the protected landscape.

led in Schleimünde for two other projects and was acquainted with the conditions on site quite well.

The job-site equipment was loaded onto two trailers and pulled through the nature sanctuary with the help of a tractor. As a means of avoiding field damage as far as possible, the path was covered with ground plates in places where the soil was too soft. For safe manoeuvring through the rough terrain, a tractor was also put before the truck for the drill rig on the way through the nature protection area to the job-site.

The water for mixing the drilling fluid was provided by a well with a limited yielding capacity of 1.5 cubic metres per hour. "For this reason, we stored tanks with water at the job-site to buffer the water supply in cases of shortage", Martin Paasch, managing director of Paasch Leitungsbau, told us.

Drilling was started in early October. A 15-ton drill rig from Tracto-Technik came into operation. The

bore path leads all the way from the distribution station to the foot of the mole on a stretch of 200 metres. Four cable protection pipes made of HDPE with outer diameters of 140 mm and a wall thickness of 12.7 mm each were intended for the installation. The drilling operation demanded special aiming precision. The mole is bordered by two

THE DRILLING OPERATION DEMANDED SPECIAL AIMING PRECISION.

natural stone walls; the exit point of the bore was aimed directly at the centre between these walls. Therefore the bore was laid out approximately seven metres deep, the foundation of the mole had to be undercrossed at a relatively steep exit angle

in order to reach the target pit. "And that worked really well!", Jürgen Wilhoeft exclaimed. Expansion and pipe pulling caused no further trouble, the same goes for the 60 metres long drilling operation from the mole to a distribution manhole at the harbour.

UNWELCOME SURPRISE

The bore to the lighthouse had a surprise in store for the crew, however. Backed up by the as-built

drawing from the construction period, the plan was to drill the 200 metres to the lighthouse in the mole. The documents indicated that the core of the mole consisted of a sandy, drillable filling material. Instead, the company Paasch found coarse rubble which could not be penetrated with the machinery on site. "When it became clear that we were not making any progress at a depth of 1.50 metres, we tried drilling deeper. But even at 6 metres in depth, the underground did not improve", Guido Röhlich, the resident engineer of the company Paasch explained. In agreement with the customer, the decision was made to install the line in the mole with an open trench. "That made the job more expensive for us, but owing to the circumstances, we have no other choice", Jürgen Wilhoeft stated. Following the suggestion of the company Paasch, a strip as wide as the cable trench was cut out of the large-sized concrete slabs and put aside for the restoration of the surface after the protection pipes were installed.

PULLING IN THE CABLE WITH THE POWER OF WATER

For the process of pulling the cables into the

protection pipes, the company Paasch, in cooperation with the manufacturer of blowing-in technology and winches Bagela, had come up with a brilliant idea. They applied the not yet widely used method of floating the cables into the protection pipe with the power of water. Compared with the conventional way of pulling-in, this variant saves time and protects cables with great pulling lengths from too much strain caused by the pulling forces and friction. "It was the first time we ever tried out this method, and it worked optimally", was Guido Röhlich's conclusion.

At the beginning of the new year, the job-site was basically finished. There were only a few spots here and there where inevitable damage was done to the surfaces and growth which had to be reinstated. In spite of the unforeseen problems at the mole - when taking stock of the complete installation method, the results turn out positively: the lighthouse Schleimünde with its modern technology is now fit for the coming decades and nature had hardly suffered, thanks to the discerning way a modern installation method was employed. ♦

NATURAL | GAS, ...naturally occurring buried inflammable gas mixture

New high-pressure line for natural gas installed
beneath the river Ems

by Jörg Leschnig, Stadtwerke Greven GmbH (municipal utilities Greven/Germany)



Technically, supervision, maintenance and rehabilitation of the pipeline network belong to the daily routine of gas suppliers. The rehabilitation measures carried out recently by the Stadtwerke Greven were anything but routine: within the bounds of rehabilitation, a 120 metres long section of a 21.6

kilometres long high-pressure gas network needed to be renewed. The in-situ topography posed a real challenge in this short segment.

The service area of the Stadtwerke Greven in central Germany is divided into two parts by the river Ems: more than two thirds of the approximately 37,000 residents of the North-Rhine Westphalian city live on the right river bank, while the remaining third occupies the left side of the Ems. This is the location of the gas transmission station, where the high-pressure net of the municipal utilities begins. The river Ems forms a natural barrier in this way. The barrier had to be bridged over somehow - and this literally happened on the scene of rehabilitation until recently: beneath the bridge "Schöneflieth-Brücke", over which the traffic towards Munster flows, a steel pipe was fastened, forming a part of the high-pressure gas network. The exposed way the pipe was attached demanded massive maintenance expenditure with annual inspections. Frequently accumulating bird droppings, for instance, forced the maintenance team to attend to the protective coating of the lines on a regular basis. In the year 2016, the comple-

te renewal of the line from the 1980s was also pending, accompanied by an immense cost expenditure. This was reason enough for the municipal services of Greven to look out for an alternative. After extensive research, the party responsible for the project made their decision to use the HexelOne high-pressure pipe technology by the plastic pipe manufacturer "egeplast". In November 2016, the polyethylene pipe was installed; thanks to the horizontal drilling technique, the gas line now crosses beneath the river. Meanwhile, the gas has been flowing since December and the old steel pipe line beneath the bridge was dismantled.

BENEFITS OF UNDER-GROUND PIPE INSTALLATION

The scale for the decision was tipped by several factors: the underground installation saves the annual upkeep costs, an economical factor in previous times. Additionally, the situation on site played an essential part: the available space on the bridge is limited and what is more, the banks of the river Ems are nature protection areas. Applying the HDD method to install the new pipe reduced violation of the landscape to a minimum. This was made possible by a high pressure pipe system which, on the one



hand, does justice to the demands of operation and on the other hand, is flexible enough to be pulled directly from the pipe coil and into the very narrow bore hole. This section of the high-pressure gas network now lies 8.74 metres beneath the river bed of the Ems in its deepest spot; after the completion of all installation works, nothing here reminds people of the utility lifeline for the Greven energy supply.

SPECIFICATIONS OF THE PIPE SYSTEM

The pipe system in use is made completely of flexible polyethylene (PE). What makes the PE pipe system suitable for the application in high-pressure gas networks is the integrated reinforcement layer made of a high-strength PE tape. Thanks

to this fortification, the pipe is twice as strong as a standard solid-wall pipe made of PE 100. The reinforcement of the HexelOne opens up new application spectra with permissible operation pressures of 30 bar for water and 16 bar for gas, therefore exceeding the limits of application for PE pipes in the past. An additional abrasion-resistant protection coating and an internal layer made of PE 100-RC make the pipe safe for drilling fluids. The delivery lengths of up to 145 m in pipe coils or rolled on drums minimise the number of pipe connections.

When this pipe system appeared on the market in 2008, the description in the rules and standards was insufficient; therefore a certification by the

"German association for the gas and water sector (DVGW)" was not possible at that time. In spite of this, the system has proven its practicability in numerous projects under special supervision by engineers. Paralleling this, the requirements for tape-reinforced pipes were worked out in a workshop of the DVGW. Towards the close of 2015, the DVGW work sheet GW 335-A5, describing the demands on tape-reinforced PE pipes and the appending connections for high-pressure applications was published.

The described demands concern the raw materials used, the quality assurance during the production process and the testing of the finished product. Because the stability of a pipe with reinforcement layers re-

lies on the interplay of these layers, a construction-specific analysis is required. The specifications for this purpose are described in the work sheet. One element of these tests was an internal pressure test carried out over a period of two years to prove that the tested pipe system has a long-term stability when subject to pressures exceeding 40 bar.

Not only the pipes themselves but also their joint assemblies are a focal point of this quality control. Within the bounds of the examination, it has to be proven that these connections are at least as stable as the pipe itself. Along with the pressure tests, tensile and bending tests and even so-called loading cases are part of the surveillance program; after all, objective

of these tests is to make sure that all demands arising from operation are covered. After a successful conclusion of all the required tests with positive results, the HexelOne high-pressure pipe system was certified by the DVGW and now holds the DVGW certificate for gas and drinking water applications.

PILOT BORE AND PIPE PULLING IN GREVEN

The installation of the high-pressure pipe line succeeded thanks to the fluid-assisted HDD method without trouble, involving only minimal encroachment on the landscape. The plan for the bore path beneath the river Ems was drawn up in close cooperation between the District Council of Munster and the Municipal Works Greven.

After setting up the job-site, at first the pilot bore (diameter: 140 mm) was carried out, then the bore hole was expanded to a diameter of 420 mm in three steps with the help of back-reamers. The drilling fluid for supporting the bore hole, running mostly through sandy soil, consisted of Bentonite. A small surprise was in store for the crew of the company carrying out the drilling operation when they came upon timber pilings, rammed approx. eight metres deep into the ground in the slope zone of the river bank. This obstacle (probably remains from an old bridge) was not recorded in the documents; as a result, the bore path was adapted to the circumstances.

Besides the high-pressure line, a medium-pressure gas line and two ductwork pipes were also pulled in. In the course of this action, gauging members attached to the gas lines recorded the effective traction forces during the pulling-in process. After installation, at first two pressure tests, a strength analysis and an impermeability test had to be worked off according to DVGW standards; then the integration of the PE-pipe in the already existing steel pipe ND 150 could begin. In the course of this action, the new high-pressure gate was also installed. On completing all jobs and performing the pressure tests, the new section is now integrated in the high-pressure gas network and ready for service. ♦

NEW WIND FOR RENEWABLE ENERGY

Trenchless connection of three wind farms in the Uckermark region



People have been making use of the power of the wind for thousands of years. Windmills have a long tradition of grinding grain or driving saw and oil mills. And no less important, wind was soon harnessed for the purpose of propulsion, e.g. on sailing ships. Free of charge and available without limit, wind today has a completely different role. Today, modern wind turbines convert the energy of the wind into electricity. In a relatively short period of time, wind energy has become a mainstay of the energy transformation that has been proposed for years (gross electricity generation in 1990: 71 gigawatt-hours; 2016: 65,000 gigawatt-hours) and makes a major contribution to electricity supplies in Germany. Experts claim that of all the different forms of renewable energies, it has the greatest economic potential for expansion in the short to medium term and for this reason alone plays such a remarkable role in the energy transformation.

CLEAN POWER, CLEAN HIGH-VOLTAGE GRID
ENERTRAG AG of Dauerthal (a village of the mu-

nicipality of Schenkenberg in the German state of Brandenburg) is involved on a large scale in the development of wind energy and is one of the leading wind power generators with more than 667 wind turbines installed to date and 2.9 billion kilowatt-hours of electricity per year. Calculations of the Federal Ministry of the Environment predict that this alone represents reductions of 1.9 million tonnes of carbon dioxide, 297 tonnes of nitric oxides and 27 tonnes of fine particulates! The energy provider generates its electricity exclusively from renewable sources – primarily from wind energy – and services every link in the total production chain of sustainable wind energy. The clean energy generated by the turbines is primarily fed into the company's own high-voltage grid (which has also been cleanly installed in the ground), which is connected to the European supergrid.

OUT OF BOUNDS

In July 2017 it became necessary to expand the three wind farms Klockow III, Schenkenberg



IV and Schenkenberg V in the municipality of Schenkenberg with 13 additional wind turbines. To connect these three wind farms and their 13 new wind turbines to the nearest transformer station, the appropriate piping and cable routes had to be established between the extensive grain fields. ENERTRAG AG contracted Thomsen Anlagenbau GmbH & Co. KG from Ziesendorf nearby to do this. On loam and sand soil, which is typical over large swathes of the Uckermark region, this was sheer routine for the experienced company - but for the A20 motorway crossing the area between the Bad Segeberg exit and the Uckermark intersection.

SO WE GO UNDERNEATH

The responsible motorway administration office had already explicitly prohibited access to the motorway, meaning that one thing was set in stone: connecting the three wind farms and the transformer station would require three fluid-assisted steerable bores (HDD) under the motorway, each of them 90 m long, to enable

protective pipes for three medium-voltage systems to be installed. It was especially important to keep an eye on the locating technology. This had to be extremely precise, even at great depth. Thomsen Bohrtechnik GmbH & Co. KG, a proven HDD specialist that has covered a broad range of horizontal directional drilling for many years with its own equipment predominantly sourced from TRACTO-TECHNIK, was contracted to do the job. It soon became clear that the GRUNDODRILL^{15XP} fluid-assisted HDD unit seemed to be the most suitable machine. It is a recognised all-round talent in many respects – and that is exactly why it was needed for drilling under the motorway.

The performance parameters of the machine, for example the drill rig with rubber track undercarriage, the bore automatics, the semi-automatic rod changing system, the powerful Bentonite HP pump on board the rig or the semi-automatic clamp and break-away device meant that it was made for this job. The first



thing that spoke for it was that it would still have power in reserve in the event of unforeseen problems. Drilling under a motorway is a job with greater risks. For example, there is always the latent risk of the drilling tool becoming stuck, e.g. due to changing ground conditions. Being able to activate power reserves in such a situation is hugely important to enable drilling to be successfully completed. Fortunately, that wasn't necessary when drilling under this motorway.

PRECISE, SAFE AND EFFECTIVE

Before the start of actual drilling work, attention was first directed at the locating technology, which would have to be extremely precise, working at great depth. Thomsen Bohrtechnik swears by the DigiTrak locating systems and

made no mistake with this for these bores. The so-called XL transmitter was selected, which not only transmits clear signals from depths of up to 30 m, but which also transmits signals forwards or backwards very well. Then, once the composition of the drilling fluid and the necessary drilling tools had been defined, work could start on the first of the three bores for laying the HDPE protective cable pipes, OD 180 x 16.4 mm for accommodating the medium-voltage cables and HDPE protective pipe, OD 50 mm for accommodating the fibre optic cable in a bundle.

For the GRUNDODRILL^{15XP}, it was not a feat of strength, but rather a question of precision. The pilot bore was drilled with a diameter of 120 mm. The loam/sand soil reacted to the control unit

very well. With a thrust force of approximately 20 kN and a drilling fluid flow rate of around 70 to 100 l/min., it was possible to complete the first pilot bore under the motorway in about one and a half hours. As an intermediate step, the first expansion was then performed with a medium soil reamer (MSR) Ø 225 mm. Then, to enable the HDPE protective pipes to be effectively and reliably laid, a second expansion was performed with an MSR Ø 300 mm, with the pipes being successively pulled into the bore string at the same time. The pulling force needed for this was approximately 30 kN; the drilling fluid flow rate was between 130 and 160 l/min.

RELIABLE: LOCATING AND GRUNDODRILL^{15XP}
Drillmaster Sebastian Block needed just under

six hours for all three pilot bores, including the whole works, and he was very pleased with his work. "Thanks in part to the reliable locating system, the GRUNDODRILL^{15XP} had no problem accurately controlling the three pilot bores at depths of five, six and seven metres and a centre distance of one to one and a half metres under the A20, without even having to set foot on the motorway." The medium voltage and glass fibre cables were then pulled into the protective pipes and the bushings were also quickly completed. The other cable routes, which run parallel to the A20, were created by Thomsen Anlagenbau with their own Föckersperger cable plough.

PARTNER FOR WIND ENERGY AND HDD

For years, fluid-assisted horizontal directional drilling has been a regular procedure when setting up wind turbines. And not without reason. Wind energy is a very environmentally compatible way of generating electricity, and now accounts for a considerable proportion of Germany's power supplies. The power suppliers involved naturally have a great interest in setting up their generators, that is wind farms, using environmentally compatible technology, and that starts with the building of the cable routes. Horizontal drilling reduces CO₂ emissions and impact on nature and the environment to a minimum, allowing fast, safe and economical drilling under paths, roads, motorways, rail tracks and waterways. ENERTRAG, as an energy supplier who only generates power from renewable sources and is one of the leading generators of wind power, made its decision on the basis of these criteria. Those responsible summarised this very eloquently: "Wind energy and trenchless construction go together perfectly. Construction time is massively reduced by the use of no-dig techniques and no least, the impact on the environment is also minimised."

If wind energy has the greatest economic short- to medium-term potential for expansion of all renewable energies, as experts suggest, then HDD technology is the ideal partner – and wind energy will play an even more remarkable role in the energy transformation. ♦

WATER CONNECTION

1, 2, 3



Irrigation line for new grass football pitch



View from start to exit pit.



The installation required utmost precision.

The new grass football pitch of the football section of TV Eversberg in Meschede / Germany is its pride and joy and was opened for action in the summer of 2017 after many years of planning and thanks to both public and private funding.

The new irrigation system for the pitch was to be supplied with spring water from a water catchment near the new sports pitch. As a company with a strong com-

GRUNDOMAT CARRIED
OUT THE INSTALLATION QUICKLY
AND ACCURATELY DESPITE
THE ROCKY GROUND.

mitment to its region, TRACTO-TECHNIK carried out the partial installation of the water line as part of a test site. With the GRUNDOMAT soil displacement hammer, the installation was carried out extremely quickly and accurately despite the rocky ground.

The GRUNDOMAT⁷⁵ with coring head was used to install the PE water pipe OD 63. The 8 m-long pipe corridor ran



Arrival at the target.



The new water line.

through a slight downhill slope 1.0 - 1.2 m beneath a road and through rocky ground containing many other lines. This required the maximum possible precision and positional accuracy. However, the natural soil with high proportions of shale and clay only allowed a very narrow starting pit, which was too small for a starting cradle and meant that the soil displacement hammer had to be supported and aligned on wooden blocks.

The new water line was installed and the site cleared after just 3 hours. The officials of the sports club were impressed by the speed of the trenchless pipe installation and the teams of the "SG Eversberg/Heinrichsthal/Wehrstapel" club can look forward to playing their home games on a pitch that is always well watered! ♦

The tried and tested, powerful crowned head of the GRUNDOMAT⁷⁵ worked its way through the rocky subsoils without problem. Forward motion based on the 2-stroke principle ensured the maximum possible accuracy. Upon arrival at the destination, the water pipe was connected using a pulling head and then drawn back through the hole in reverse together with the soil displacement hammer.



A BOLD ASCENT FOR STATIC PIPE BURSTING



The GRUNDOBURST¹⁹⁰⁰⁶ with its attachment frame, installed in the work pit.



Upgrading the capacity of two water mains in the Swiss canton of Zug

The residents of some of the localities situated above the Swiss community of Zug can enjoy the purest spring water which flows straight from their taps. The people of Zug, however, receive their spring water mixed with ground-

water in two equal parts. The spring water comes from ten different headwaters having their source in the craggy Lorzental. There it is collected in so-called well houses and transported from these up a rather steep cliff into a reservoir abreast with the Tobel Bridge which crosses over the deep ravine of the Lorze. One of these spring water catchments is the

"Brunnenstube Lorzental" which is connected by two lines with the Tobel Bridge reservoir higher up. The well house "Brunnenstube Lorzental", built in 1908, was completely renovated in 2004, and in 2016, the renewal of the two water mains ND 100 (fibre cement) and ND 200 (grey cast iron) was due.

NEW LINES WITH GREATER CAPACITY

An open-cut renewal would have been much too laborious and expensive in the steep ravine of the Lorzentobel, therefore the WWZ Energie AG opted for static pipe bursting, a trenchless pipe renewal method. This procedure allows not only the complete underground renewal of pipe lines, at the same time it is also possible to increase the pipe capacity because the nominal width of the new pipes to be pulled in can be up to two si-

zes larger. This killed the proverbial two birds with one stone because the hydraulic capacity of the spring water main was no longer sufficient for larger quantities anyway. In the course of pipe bursting, the old pipes were replaced

by new PE-coated ductile cast iron pipes with larger diameters of ND 250 and ND 300. The WWZ AG entrusted the TPS Trenchless Piping Systems AG from Zurich with the project; this company, as a part of the Hagenbucher Group, enjoys a good reputation as a specialist for trenchless methods in Switzerland. For bursting open the old pipes and pulling in new ones, the

TPS and the WWZ incorporation placed their trust in the GRUNDOBURST rig from TRACTOTECHNIK GmbH & Co. KG; these powerful machines have no trouble even with such large pipe expansions.

RAPID
INSTALLATION PROGRESS,
ECOLOGICAL PLUS FACTORS
AND GREAT COST SAVINGS -
CONVINCING CRITERIA FOR
PIPE BURSTING.



DIFFICULT SOIL CONDITIONS IN A SPECTACULAR LANDSCAPE

Not only the capacity upgrade was downright ambitious, the job-site itself, located on the foothills of the Swiss Alps, was a serious challenge: after all, the lines lead all the way up to the water reservoir, taking their course along a very steep cliff consisting of extremely weathered rocky formations which are anything but solid. "The route rises at an inclination of 45 degrees and because of its structure and the extreme weathering influences, the soil is acutely liable to slips", Plasch Depeder, the Division Manager at the TPS incorporation, describes the situation on site. If the project were going to be carried out with open trenches, the machines would have to be secured painstakingly along the precipice. The unsafe underground with a liability to slipping was also the reason why the existing access road, meanwhile badly in need of



The new PE-coated ductile cast iron pipe ND 300 in the process of installation.

rehabilitation, was no longer able to hold out against the heavy building machinery. Therefore, a new, temporary access road had to be built before the actual project could be started at all.

STEP BY STEP TOWARDS THE GOAL

The launch pit was excavated at the foot of the wooded slope and two target pits, one for each line, were set up approximately 55 m uphill. "In spite of the soil conditions, we did a relatively good job installing the concrete abutment", Depeder tells us. In the case of the smaller

old line ND 100, the TBS incorporation had to work in two steps, forced upon the crew due to the extremely large expansion: at first, the old line was cut open with a GRUNDOBURST 800G and the 75 mm rods pushed in; the se-

cond step was to pull in the 120 mm rods of the GRUNDOBURST^{1900G} which was then applied because of its higher performance. As soon as the expanding tool and the new PE-coated pipe were connected, they were pulled through the old pipe while the pipe fragments were pushed into the surrounding soil in process. The GRUNDOBURST^{800G} is able to replace pressure and water mains from ND 80 to 400 at a length of approximately 100 m without trenches, while the GRUNDOBURST^{1900G}, which can raise a maximum traction force of 1900 kN, is used for

pipes from ND 250 to ND 800 over a maximal length of 300 m.

The GRUNDOBURST^{1900G} was used for the installation of the larger water main ND 200 exclusively:



The smaller PE-coated ductile cast iron pipe ND 250 after installation.

this time, the pipe bursting rig also pushed the bursting rods through the old pipe and up to the pulling-in pit. As soon as the cutting and expanding tools, made according to specifications by TRACTO-TECHNIK, and the new pipe were linked on, they could also be pulled through the old pipe.

QUICK AND ECONOMICAL PERFORMANCE THANKS TO A POWERFUL PULLING TECHNIQUE

On the one hand the extremely powerful and robust GRUNDOBURST pulling rigs and on the

other the Quick-Lock rods, which are not screwed but simply clicked together to form a pushing- and pulling-resistant rod string, played a great part in the rapid progress of the project. Besides the short installation and equipping times, price and

environmental aspects were in favour of the trenchless renewal of the lines using the static pipe bursting method. Neither time nor costs were wasted for the recovery of surfaces, the bore paths were already at hand and did not need to be cut through first before getting started, the required building space was clearly scaled down. "We believe that pipe installation with the static pipe bursting method can save 15 % to 40 % of the costs when compared to open-cut methods", believes Yves Hungerbühler, Sales Manager of TRACTO-TECHNIK Switzerland. In the case of pipe renewal in the wooded slope at the Lorzentobel in the picturesque landscape at the foothills of the Alps, the ecological benefits carried even more weight. No great masses

of soil had to be excavated and moved away, thus the tree population was treated with care.

Rapid installation progress, ecological plus factors and great cost savings - these were the criteria which convinced the WWW Energie Incorporation. The whole building measure was successfully completed in approximately two weeks time. Since then, the spring water is flowing through the two new lines to the reservoir and from there to the households of round 30,000 people living in the community of Zug. ♦

MODERN TECHNOLOGY ON ANCIENT GROUNDS

Pipe renewal with GRUNDOCRACK^{PCM180} in Germany's eldest city

When the ancient city of Treves was founded in the valley of the River Moselle in the year 17 B.C., it was first known under the name of Augusta Treverorum. From the day of its founding, Treves has borne the title "city" incessantly and can look back on a very eventful past: in the course of their long-distance road system development, the Romans built a wooden bridge crossing the Moselle, thus providing the hotbed for the town lying on the eastern banks. The town rapidly advanced to an *Urbs opulentissima* (= extremely wealthy town) and soon became a seat of the government of the Western Roman Empire. More than 500 years of the Roman past have had a significant impact on the image of the town, which is still very prominent even in our time.



magnificent credentials of a long history, some details are perishable. In the immediate vicinity of the Imperial Baths and facing them only a few steps away, lie the police headquarters of Treves with the police station. On the premises, following the slip road, an approximately 20 m long section of the sewer pipe network has finally failed its services after many years of duty. Within the bounds of an inspection, massive damage and leakage were discovered. As a means of verifying the aspects of damage, the responsible party decided to excavate the 5.50 m deep vitrified clay pipe line (ND 300), partially embedded in concrete. In the generously proportioned trench, vitrified clay shards were found scattered in several places; some of them protruded into the line or were steeply canted, allowing the waste water to run freely and seep away into the soil.

A CHANGE OF MIND

This massive damage had not been anticipated by the building owner, the state office LBB Rhineland-Palatinate with its branch in Treves, so the original decision to renew the sewer using open trenches was dismissed. Considering the confined spaces on the work yard

and in view of the damage aspect on a stretch of approx. 20 m, the decision was reached in favour of a trenchless renewal of the sewer pipe line.

Expert advice was needed now, and this was provided by Michael Gastreich, field manager of the TRACTO-TECHNIK branch South-West in Viernheim. He recommended the dynamic pipe bursting with GRUNDOCRACK. With this method, damaged old pipes can be renewed without trenches and in the same bore path with the old pipe being replaced by a new pipe of identical or even larger diameter. The pneumatic GRUNDOCRACK shatters the old pipe and pushes it into the surrounding soil with the help of an expander sleeve. The new pipe is pulled in during the same process. The company Keren Bau tendered this method and was awarded the contract for this job after the call for bids.

PROVIDED

In early May 2017, the work yard of the police headquarters of Treves with the police station facing the Imperial Baths provided the staging for a pipe bursting performance straight from the textbook. Thanks to the excavation for the purpose of investigation, an oversized launch pit was now available for watching all the details of the pipe bursting method step by step and metre for metre. The complete equipment for the operation consisted of:

- a GRUNDOCRACK^{PCM180}
- a short pipe expander with blade ledges of 395 mm located to the front
- a Bagela winch (cable pulling winch) KW 3000
- a winch boom with deflection roller
- the new Concept-HL thrust pipes to be pulled in, made of PP-HM with internally and externally smooth spigot and socket joints and lip seals, ND 300, installation length 1.00 m
- one hydraulic Spannfix with tension pulley adapter for the new thrust pipes

and not to forget the know-how of the two pipe bursting experts of TRACTO-TECHNIK, Guido Fitting and Michael Gastreich.

KICK OFF

The old vitrified clay sewer pipe line waiting for renewal was put out of service first and then the bed of the launch pit was pried free. An access manhole served as the target pit. Well-versed and without many words, the preparatory jobs were taken up and every single one of the following manoeuvres hit close to home:

- pulling the winch cable into the mains waiting for renewal
- threading in the PP-HM thrust pipes (winch cable/chain, compressed air supply)
- setting up the compressor and connecting the compressed air hose
- preparing the GRUNDOCRACK (fastening the winch cable, assembling the short pipe expander)





- with the blade ledges)
- self-supported positioning of the Bagela winch
- lowering the winch boom into the target pit/linking with the winch
- lowering the GRUNDOCRACK into the launch pit, linking the winch cable with the head
- lowering the first PP-HM thrust pipe.

With the first mains of 12 m in length (from the launch to the target pit in east-south-eastern

direction) the operation could finally take off: firing up the compressor, setting the direction lever to "forward", a single push of the button at the control panel of the cable pulling winch, connecting the hydraulic Spannfix tensioning device with the first pipe to be pulled in and in no time at all the cracking and crushing of the old vitrified clay pipe could be heard and at the beginning even be seen.

FINALISING

The GRUNDOCRACK made a real good job of it: the old line was cracked open, the shards pushed laterally into the soil and one pipe after the other pulled in without trouble. Thrust performance and cracking up of the old pipes was the exclusive business of the (GRUNDO)cracker. The Bagela cable winch assures guidance in the old path with a continuous pulling force of 35 kN and supports the dynamic force for bursting and expansion of the old pipe.

After the somewhat tricky recovery of the expander head, due to the confined space in the target pit (the dynamic pipe bursting machine was pulled back into the launch pit and recovered from there), a glance at the clock told us: 1.5 hours had passed since the go-ahead for the renewal of the 12 m long mains.

For the second, 8 m long mains (from the launch pit to the target pit in north-western direction) the team required approximately half an hour longer. A reason for this was delivered by the defective pipe line itself: it had once been massively set in concrete in some parts which made the dynamic pipe bursting process as well as the radial displacement of the shards significantly more difficult.

TAKING STOCK

The application of dynamic pipe bursting provided convincing advantages for this measure:

- rapid installation and a quick start-up of the facilities; minimal disturbance of the routine on the premises of the police station (slip road)

- the compact dimensions of the dynamic pipe bursting machine allow unhampered application in the confined spaces on the work yard of the police station (slip road)
- the light-weight pipe burster is easily transported without the need for additional large machinery
- the rapid work cycles and high performance stood for
 - minimal work limitation on the premises of the police station
 - high daily output with rapid installation progress (cost-saving)
- no soil is ripped open for trenches (minimal interference of the daily routine)
- significantly reduced noise disturbance, minimal agitation
- in view of economy, the long service life of the new pipe is a lot more attractive than rehabilitation or repair
- the existing line path is used
- one machine is used for two work cycles at the same time
- minimal soil movement, low costs for transportation
- the costs for the installation hardly depend on the depth position

In a city like Treves with its history reaching back over two thousand years, the service life of a sewer line is of little consequence compared with the "survival time" of its Roman relicts. For the state office LBB Rhineland-Palatinate as the owner of the line, however, this is a different situation altogether: the renewal of the sewer pipe allows pressing the "reset" key and grants an economical calculation with a new, long service life. ♦

DIGGING SMALL PITS AVOIDS TEARING STREETS OPEN!



Restoration of a combined wastewater sewer in Dresden using the pipe bursting method

The sewerage system in Dresden is approximately 1800 kilometres long. Following the

research by Frank Männig, the director responsible for sewer system operation at the Stadtentwässerung Dresden GmbH (urban drainage

corporation), the eldest small sewer network, installed beneath the Theaterplatz and still in service, dates far back into the 18th century. The combined wastewater sewer in the south-east of Dresden, leading from the road "Am Knie" to the "Hepkesstrasse" where it flows into the main sewer, is not quite as old but has also been around for about 100 years, as stated by the people in charge. Grime, external waters and rain have left severe signs of damage in their wake in the course of the decades. Especially the extensive crack and shard formation forced the decision made by the end of 2016 to rehabilitate the old concrete sewer. In this case, the urban drainage corporation agreed on trenchless renewal with the pipe bursting me-

thod; the old pipe is replaced by a new pipe with the same or an upsized diameter in the old pipe line route. The company Andreas Petzold e. K. Rohrleitungsbau was commissioned to carry out the renewal. They decided to go for the GRUNDOBURST rig manufactured by TRACTO-TECHNIK to break up the old oval concrete profile and pull in the new circular PP-pipe. The fact that the old oval profile ND 250/375 was expanded to ND 450 for the new PP-pipe deserves mentioning, but it presented absolutely no problems at all for the GRUNDOBURST.

FURTHER REPAIRS ARE NOT POSSIBLE

Approximately 780 km of the sewerage system in Dresden are combined wastewater sewers, roughly half of these are older than 50 years and 20 % are even more than 100 years old. Against this background, fundamental enlargement and rehabilitation measures of the sewer network had been carried out in the previous years - for instance in a length of 40 m beneath the road "Am Knie" at the corner of the "Hepkestraße", a residential area with large multi-family houses. The old concrete pipe ND 250/375, lying three metres deep, had been repaired again and again and fixed with concrete plugs. "Due to the advanced dama-

ges, further repair measures - like hose lining - were out of the question", we were informed by Andreas Petzold, owner of the pipe line civil engineering company of the same name. So the people in charge chose to renew the pipe using the static pipe bursting method which has been appointed reliably for the trenchless renewal of pressure and free gradient lines in the past 30 years and longer.

DUE TO THE
ADVANCED DAMAGES,
FURTHER REPAIR
MEASURES WERE
OUT OF
THE QUESTION!

PULLING RIG WITH POWER RESERVES

To get the job going, a GRUNDOBURST pulling rig which is able to renew damaged old pipes with circular or oval profiles and diameters up to 1,200 mm without trenches, was installed in a machine pit with dimensions of 9 x 2.5 m. The pulling-in pit was excavated at the same time. At first, the pipe bursting rig pushed the bursting rods through the old pipe and up to the pulling-

in pit. As soon as the cutting and expanding tools, made according to specifications by TRACTO-TECHNIK, and the new PP-pipe were linked on, the actual pulling-in process was started: with a pulling force of approximately 60 t to a maximum of 180 t, the cutting and expanding tools with the new pipe hanging on were pulled through the old pipe. In the course of this action, the concrete fragments were pushed into the surrounding building ground. Whenever required, the rig can work up a pulling force of up to 2,500 kN (pushing force 1,055 kN). "For us, the possibility to fall back on considerable pulling force reserves was of uttermost importance" says Petzold. With the high-performance and robust GRUNDOBURST^{2500G} and its cutting blades, pipe bursting exhibited no difficulties. Petzold: "In spite of the many concrete plugs inside the pipe, going through was like cutting through butter."

GOOD ARGUMENTS

The Quick-Lock rods also worked in favour of a rapid execution of the building measure because they don't have to be screwed but are simply clicked together, forming a tight connection. These rods even allow driving slightly bent radii. Thanks to these advantages, the net bursting process took



Picture left: The bursting head • Picture center: GRUNDOBURST^{2500G} with support from inside the construction pit. • Picture right: The Quick-Lock bursting rods.



Picture left: the new PP pipes ND 450 had to be handled by crane • Picture center: Crews in the machine and reception pit keep constant radio contact while the new PP pipes are being pulled in. Picture right: The bursting head with new pipe attached has arrived in the machine pit.

no more than six hours. Only the inevitable welding and cooling periods when the single pipes were joined together forced the crew to interrupt bursting. In the course of sleeve welding with incorporated heating element, the PP-pipes were connected under pres-

sure in a thermoplastic condition. The effective handling of the Quick-Lock rods which causes shorter installation and set-up times was not the only argument for applying the static pipe bursting method: neither roads nor pavements need to be broken up,

the costs for surface restoration are dropped and the road and pedestrian traffic is much less affected. Another advantage is granted by the fact that a new line path is not required and the work space needed can be kept within a limit. And last, but not least, the eco-

logical plus factors count: there is no need for moving greater soil masses. The tree roots are treated with care and long-term damages due to ground subsidence or groundwater influence is almost ruled out completely. "Additionally, we believe that pipe replacement

using the static pipe bursting method can save 15 to 40 % of the costs when compared to open-cut methods", adds Philipp Schumacher, Product Manager at TRACTO-TECHNIK.

After establishing the machine and pulling-in pit on two

subsequent days, the actual pipe bursting started and only a few hours later it was completed successfully to the full satisfaction of all people concerned. So now nothing stands in the way of utilisation for the sewer line during the next decades. ♦

PIPE RAMMING PROVES GOLDEN FOR HDD PROJECT IN COLORADO

BTrenchless beats the bedrock using HDD-Assist



Pipe ramming and horizontal directional drilling may seem like an odd combination, but many times you can find the two trenchless methods on the same project, often being used in a most complimentary manner. Over the years, the two methods have teamed up on countless pipeline installation projects for many different industries. Recently pipe ramming played a key role in the HDD installation of a gas transmission main in in the US state of Colorado.

In the heart of what many would consider beer country, Golden, a pipe ramming HDD assist technique helped facilitate the installation of a Ø 500 mm diameter gas main under a highly traveled roadway and adjacent to several important water sources. BTrenchless was contracted by Global Underground Corp, Colorado Springs, Co., to install a Conductor Barrel™ casing through pneumatic pipe ramming in an effort to manage drilling fluid. In order to install the Ø 1.200 mm conductor barrel casing, a Ø 600 GRUNDORAM^{Taurus} from TT Technologies was used.

According to BTrenchless Project Manager Chris Gray the installation was not without challenges. He said, "We needed to take into consideration a variety of issues from the soil conditions to the layout of the job site itself to make this project successful. But in the end, we were very pleased with the results."

PIPE RAMMING & HDD

The saying goes, "Necessity is the mother of invention," and that saying holds true when it comes to using pipe ramming to assist with difficult horizontal directional drilling projects. One such method is the Conductor Barrel casing. During that process a casing is rammed into the ground, at a predetermined angle, until desirable soil conditions are met. The spoil is removed from

the casing with an auger or core barrel. Drilling proceeds within the casing in the desirable soil conditions. In addition to assisting drilling operations at the start, the conductor can also serve as a friction-free section during pullback.

For the project in Golden, the conductor barrel was key in helping the drilling contractor prevent fluids from forcing their way into the area waterways. In this sense, the conductor barrel acted like a containment system.

HDD ASSIST TECHNIQUES

In addition to the Conductor Barrel technique, several other pipe ramming HDD assist techniques have been developed that today, in many cases, become standard practice in the HDD industry.

TT Technologies pipe ramming specialist Rick Melvin explained, "It's very common now for HDD contractors to have pipe ramming equipment on site, ready to go on their HDD jobs. Probably the most common HDD Assist technique we see is during pullback, Pullback Assist. We can often overcome hydrolock during pullback by putting a rammer on the back of the product pipe and add some percussive action. This tends to loosen things up and assist in completion of the bore."

Pipe rammers can also be used to remove a stuck product pipe (bore salvage) or remove stuck drill stems (drill stem recovery). In the-





Crews rammed Ø 1.200 mm steel casings at the launch and exit pits to seal off and prevent ground water from entering during drilling operations.

barrel casing. Gray said, "The intention was to install the casing and seal it into the bedrock approximately 15 m below grade. So we set up to ram the steel casing at a 12-degree angle, 23 % slope, which was the predetermined bore angle, and began ramming the casing. If it worked, we would essentially seal off the ground water in the area from entering the casing."

The ramming pit was excavated to meet the slope requirements of the drilling angle. Crews utilized the tracks from an auger boring machine to create a ramming platform at the proper angle of attack for the installation. This would also allow crews to use a Ø 1500 boring machine with Ø 1.200 augers to clean the spoil from the conductor barrel.

Once the platform was complete, the first section casing was moved into position and the Ø 600 pipe rammer was

connected to casing. For the pipe ramming operation, BT used three air compressors of various sizes. Gray said, "The elevation of Golden Colorado is approximately 1670 m above sea level. For every 300 m in elevation, you lose a percentage of your air compressor capacity. In order to compensate, additional compressors are sometimes needed. We wanted to make sure we had plenty of power for the rammer on this project."

RAM, REMOVE & REPEAT

The bore path for the gas main installation was designed to travel from a bore pit on the south end of the project, under railroad spur for the local brewery, a creek and Highway 58 to an exit area on the north end, approximately 730 m away. Before the pilot bore could begin, crews needed to install the Ø 1.200 mm conductor

connected to casing. For the pipe ramming operation, BT used three air compressors of various sizes. Gray said, "The elevation of Golden Colorado is approximately 1670 m above sea level. For every 300 m in elevation, you lose a percentage of your air compressor capacity. In order to compensate, additional compressors are sometimes needed. We wanted to make sure we had plenty of power for the rammer on this project."

Ramming operations progressed to a point where crews thought they had reached bedrock. Crews cleaned the spoil out with the auger system and encountered several large boulders, which required individual retrieval from the casing. A soil analysis, however, determined that the casing had not yet reached

bedrock and additional ramming would be required. Crews continued ramming to a point of 58 m until the desired bedrock formation was reached. Little did Gray and his crew know the whole process would need to be repeated again on the same project.

ENCORE PERFORMANCE

Initially, the project only included one casing installation, however BTrenchless was later called back to the site to install another one at the exit pit. Gray said, "Global Underground contacted us again after the HDD process began. Once the pilot bore cleared the bedrock on the north end of the project, the bore pit was inundated with ground water that had traveled back along the HDD route. The objective here was to ram a casing down to bedrock on the north and encapsulate the drill head. This took some careful planning, calculations and execution."

Not everyone was convinced that this method would solve the ground water issues or that BTrenchless would be able to hit the location of where the HDD drill head exited the bedrock. Using the same type of set up used on the first Conductor Barrel, crews rammed 56 m of Ø 1.200 mm steel casing on the north end of the project for the exit pit.

Ultimately, it was determined that the casing on the north end of the project entered the bedrock within a couple of tenths of where the center of the HDD drill head exited the bedrock and sealed off the ground water. Melvin said, "This was a very impressive project from a pipe ramming point of view. Hitting the target on that second Conductor Barrel alone takes the right contractor and obviously BTrenchless was more than up to the task." ♦

EARLY PRACTICE MAKES MASTERS...



Our GRUNDODRILL HDD technology is inspiring even the youngest like Josh McClure, son of our Australian customer Tim McClure. Tim's civil engineering company R&R McClure Excavations from Castlemaine specialises in demanding HDD bores having executed numerous spectacular projects in Australia's altering geologies. To do so R&R McClure are using two GRUNDODRILL^{18ACS} rigs and a GRUNDODRILL^{15XP}. The photo shows Josh in the operator cabin of one at the age of four. ♦



RECYCLING WITH EVEN MORE SYSTEM



The *imdex* Group

KOOPERATIONSPARTNER

New mobile unit from AMC for the optimal recycling of HDD drilling fluids

The recycling units and modules from AMC Europe, cooperation partner of TRACTO-TECHNIK since 2016, offer customised solutions for the optimal separation of solids from the HDD drilling fluid. The closed flushing systems protect the environment, minimise product use and optimise the drilling process.

A decisive factor for the effectiveness of recycling is the degree of separation and the following principle applies: The more efficiently the recycling plant separates the solid materials from the HDD drilling fluid, the lower the costs for equipment and disposal. Equally

important is the specific composition of every drilling fluid. There is no effective universal solution when it comes to recycling technology. That is why all recycling units from AMC have three separation stages whose individual modules can be assembled depending on ground conditions and drilling fluid volume.

Solids are separated from the drilling fluid in three separation stages according to grain size and measured in micrometres (μm). Coarse parts from the return flow of the bore are separated first of all using screens. This is followed by finer separation stages using hydrocyclones and centrifuges.

1. Shaker (vibrating screens) = separate coarse = solid materials = separation cut 60 - 74 μm .
2. Desander and desilter (hydrocyclone) = separate sand/silt grain proportion = separation cut 25 - 44 μm .
3. Centrifuge = separate the fine grains = separation cut $\leq 25 \mu\text{m}$

Only if these modules perfectly match the individual drilling fluid, 100% of all dissolved solid materials apart from the Bentonite can be removed from the drilling fluid so that it can be reused safely and disposed of properly.

The first separation stage is accomplished by the shaker. The screens work under constantly shaking movements. The liquid part of the drilling fluid and the particles that are smaller than the mesh width pass through the screen cloth, whereas the coarser particles are held back. The separation precision is very high. As

most coarse and also most aggressive solid materials are being screened in this first separation stage, the shakers of the AMC recycling units are low-wear and well-designed against possible clogging of the openings. They can also manage a high volumetric flow rate and can be exchanged to optimise the separation process if required.

The next separation stages, desanding and desilting, separate the finer sands and some of the silt. Both separation stages work with hydrocyclones. The desanders separate the coarser grain proportion up to 44 μm and the desilters the finer proportion up to 25 μm from the drilling fluid.

Hydrocyclones are characterised by their high separating effect, low separation precision, minimal space requirements, good control options, simple handling and severe degradation of drill cuttings by hydrocyclone and feed pump.



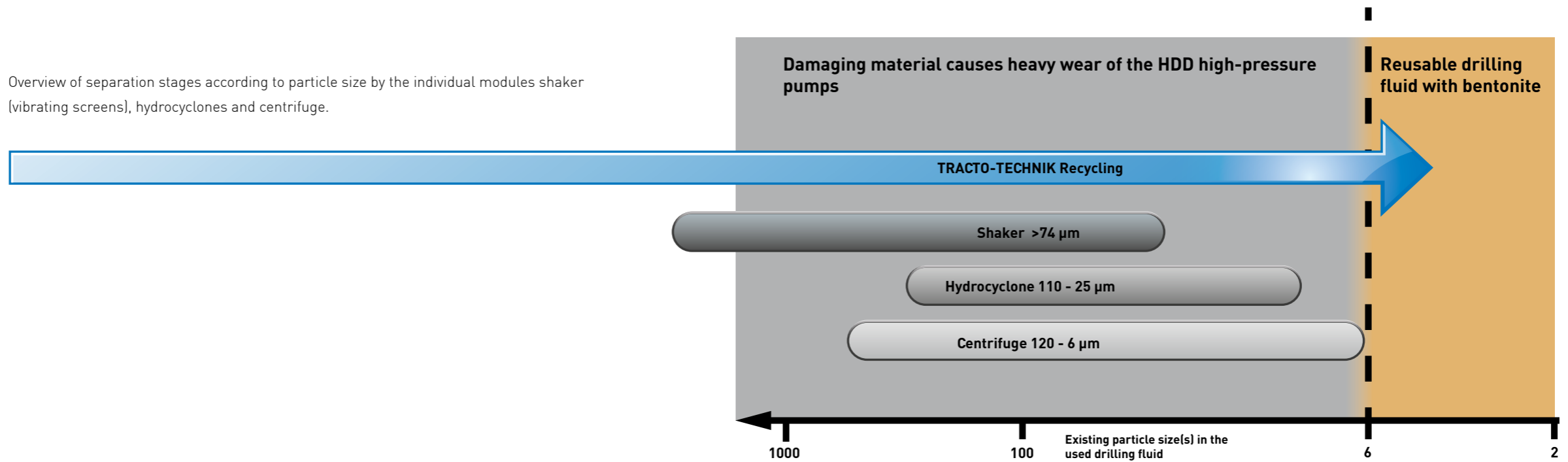
Picture above: Recycling unit with double-deck vibrating screens (shaker) for optimal separation of coarse solids from the drilling fluid.

Picture left: Hydrocyclones for the separation of the sand/silt grain proportion in construction site applications.



The bore hole is mainly supported by the Bentonite drilling fluid which continuously discharges the bore spoils the bore head has cut free.

Overview of separation stages according to particle size by the individual modules shaker (vibrating screens), hydrocyclones and centrifuge.



Centrifuges are the final separation stage and offer a major advantage in AMC recycling technology. They basically consist of a spiral conveyor with a straight and tapered part. This spiral conveyor is loaded with the remaining drilling fluid and put into high rotation in its capsule housing. High centrifugal accelerations develop which cause the finest particles to deposit at the edge of the housing. The so-

lid materials are transported by the conveyor to the tapered feed of the spiral, where they escape via an outlet as concentrated mud. This sludge is collected while the separated liquid, the reprocessed drilling fluid, is available again for further drilling. The customised and reliable recycling technology from AMC ensures maximum efficiency of this recycling process.

The latest development from AMC is the SRU2017 Trailer. This mobile recycling unit has a closed flushing system which can be easily transported as a trailer to each construction site. The use of modern screening technology combined with a centrifuge guarantees maximum cleaning of the drilling fluid and optimal protection of the HDD rig's high-pressure pumps. The SRU2017 is an in-

novative alternative to the traditional way of handling drilling fluids and monitoring solids. The mobile recycling unit recently proved its impressive capacity when it was deployed by the company REVOR in Lohmar. Only the application of the SRU2017 made the successful performance of a 400 m long HDD rock bore possible at all on this site. Read the detailed report in the next edition of Tractuell. [◇](#)



Picture left and centre: The new SRU2017 trailer. Deployed for the company REVOR to create a complicated 400 m long rock bore in Lohmar.

To see the performance of this future-oriented AMC recycling technology for yourself, you can receive a demonstration of the plants and/or rent them for your HDD projects.

For an individual consultation please contact our customer service.
Phone: +49 27 23 / 80 80

GO SAFE!

GRUNDOplus extended and used machine guarantees for GRUNDODRILL, GRUNDOPIT, GRUNDOBURST, hydraulic power packs and mixing systems

At TRACTO-TECHNIK, we strive to do more than just sell machines, we also want to provide you with expert service and offer excellent support throughout the entire service life of the machine so that you are able to fully concentrate on your business. To do that, we offer a wide range of services. The GRUNDOplus extended guarantee, elongates the legal warranty period, thus making sure that you have completely secured your investment.

ADVANTAGES & USAGE

RISK MANAGEMENT

Risk and cost control through protection against unplanned repairs. This means that the actual cost of the device can be estimated more accurately which in turn increases your competitiveness.

SIMPLE TRANSFERABILITY

The GRUNDOplus guarantee is fully transferable within the EU. If you are buying a new TRACTO-TECHNIK machine, the extended guarantee of your used machine increases the attractiveness and chances on the market, ultimately raising its value. The new owner simply needs to inform TRACTO-TECHNIK – that's all.

GRUNDOPLUS IS ACKNOWLEDGED EVERYWHERE

Repairs under the GRUNDOplus guarantee can be carried out by any TRACTO-TECHNIK branch or dealer within the EU. Full guarantee transferability within the EU gives you the peace of mind to accept any lucrative offer without worries.

For further information or an individual offer, please contact your personal sales partner. ♦



BRAND AMBASSADORS OF THE "MOLE"

Equipment packages for TRACTO-TECHNIK partners

The development of our worldwide presence and the coverage of the relevant markets is one of the key aims of TRACTO-TECHNIK's growth strategy. To this effect, the sales partners play a key role - not just through the sale of products but also as representatives and ambassadors of the brand. In order to support the partners in the best possible way as brand ambassadors, special dealer equipment packages have now been developed.

Alongside the mole as our trademark, the uniform design helps to position TRACTO-TECHNIK worldwide as a premium brand which stands for trenchless technology and related services of outstanding quality. In order to achieve maximum recognition, the uniform Corporate Design ranges from the brochures and clothing through to equipment for buildings and trade fair stands. All of these items are listed in a picture catalogue which was made available to our national and international sales partners. In order to help particularly our new partners to get started, a sponsored dealer package of basic equipment has also been put together

and can be purchased at a very reasonable price.

TRACTO-TECHNIK is proud of its brand ambassadors as they make an essential contribution towards fueling and nourishing the enthusiasm for the mole brand and thus to our worldwide success. ♦



READY FOR TOMORROW?



Robotics for trenchless applications: BADGER Consortium visits TRACTO-TECHNIK



The BADGER consortium (cw, from left): Sebastian Fischer [TRACTO-TECHNIK], Carlos Balaguer, Santiago Martinez de la Casa [UMC3], Markus Hamers [TRACTO-TECHNIK], Elisabeth Menéndez [UMC3], Alex Regrettier [Robotnik], Panagiotis Vartholomeos [SingularLogic], Raúl Molina [Robotnik], Antonios Lallas [IDS Georadar], Carme de Andrés [UMC3].

BADGER stands for "RoBot for Autonomous UnDerGround Trenchless OpERations, Mapping and Navigation". The aim of this EU funded three-year research project is to develop the first autonomous robotic system which can independently locate, map and navigate underground and is equipped with special

drilling tools to install horizontal and vertical pipeline networks. In addition to robotics, further trendsetting technologies such as sensor fusion, odometry, georadar and machine learning play a vital role in the project.

The consortium, which was founded in January 2017, is

constituted of seven partners from science, research and industry. The BADGER project coordinator is Carlos Balaguer, Professor of the RoboticsLab at the University Carlos III of Madrid (UCM3). Further members are researchers from the University of Glasgow and the Information

Technologies Institute from Greece as well as delegates from the companies IDS Georadar from Italy, SingularLogic from Greece, Robotnik Automation from Spain and from TRACTO-TECHNIK. The participation in the project came about upon recommendation of the company IDS which already successfully cooperated with TRACTO-TECHNIK in the likewise EU-funded ORFEUS project.

The consortium meets four times a year at the single

members' locations to exchange on the latest research results and the progress of the project. Beside these technical meetings, also unscheduled informational meetings take place in random order. So did the visit to TRACTO-TECHNIK. Upon invitation by Sebastian Fischer, who represents TRACTO-TECHNIK as project manager in the BADGER project next to Meinolf Rameil and Markus Hamers, the consortium met on June 21 at the technology centre in Lennestadt-Lan-

geni to learn more about the different trenchless drilling methods and the machine technology.

The consortium members were enthused by the innovative NODIG systems manufactured by TRACTO-TECHNIK and could take along a lot of valuable knowledge for their research work.

More on the BADGER-Projekt at: www.badger-robotics.eu

DOWN UNDER IS READY



In preparation of the 'Nodig Down Under' trade fair and congress, a GRUNDOMAT sales persons training for the TTAP sales team and their sales partners was conducted at the premises of our Australian sister company TT Asia-Pacific in Brisbane. Product manager Philipp Schumacher conveyed extensive theoretical and practical knowledge in selling the soil displacement hammers.

WELL TRAINED IS HALF THE BORE

New training concept for customers and partners



TRACTO-TECHNIK has always regarded qualified training as a key instrument for giving the customers the best possible advice and support, even after sales have been concluded. Moreover, we would like to familiarise planners and clients with the advantages of trenchless technology in diverse applications. Starting from the initial technical training courses that were first offered more than 20 years ago, a broad range of training and advanced training courses have been developed with around 3,000 participants taking part annually.

In order to offer customers and partners around the world even greater benefit and to meet growing requirements, the training concept has been fundamentally revised and expanded. Based on an integrated approach we are offering sales and service trainings for our GRUNDOMAT and GRUNDODRILL equipment as well as user training.

Naturally, the customers and users of our machine technology are our top priority. Extensive qualification allows them to use their

trenchless systems more effectively and thus more profitably. User training teaches intensive knowledge and skills as to the operating mode of the technology and how it is used in theory and in practice. Participants are then in a position to use and maintain the machine technology within the framework of valid technical standards.

The new training courses for servicing and maintaining our NODIG systems ensure that any repairs made by us or our service partners are always thorough and fast, guaranteeing maximum availability of the machine for the user.

Also new are the sales training courses for the sales staff of TRACTO-TECHNIK and its retail partners. The aim of these courses is to provide continual training, ensuring that customers around the world are always given the best possible advice when they make their purchasing decision, and that the investment in NODIG technology pays off.

All training courses are conducted by experienced TRACTO-TECHNIK trainers from the fields of sales, product management, marketing and machine demonstration. A detailed description of all training courses and the schedule can be found on our homepage under "Service" -> "Trainings".

- **HDD Salesperson Training**
20.11. - 22.11.2017
- **GRUNDOMAT Salesperson Training**
23.11. - 24.11.2017
- **HDD Salesperson training
GRUNDODRILL / GRUNDOPIT**
20.11. - 22.11.2017
- **GRUNDODRILL^{11XP & 15XPT} Service-Training**
19.03. - 23.03.2018
- **GRUNDODRILL^{18ACS & 28Nplus} Service-Training**
09.10. - 13.10.2017
26.02. - 02.03.2018
- **GRUNDOPIT^{6V} Service-Training**
30.01. - 31.01.2018

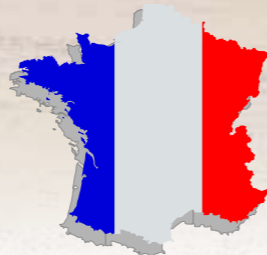
In addition to the scheduled courses, it is also possible for individual training courses to be held at the customer's or partner's premises worldwide. Please contact us at training@tracto-technik.de for an individual quotation.

First GRUNDOMAT und GRUNDODRILL sales and service trainings have already been conducted at the company headquarters in Lenne-stadt and at our sister companies' premises in England and Australia. ♦





COME SEE, TEST, GET INSPIRED



The trade fair "Ville sans Tranchée" is the most important national branch event for trenchless technologies in France. This year, the trade fair took place for the 12th time, from June 20th to 22nd, at Chatou near Paris.

At this fair, TRACTO-TECHNIK France exhibited their complete range of innovative technology for trenchless pipe installation and renewal at a 100 m2 outdoor exhibition stand. This time the focus was mainly on the dynamic pipe renewal with GRUNDOCRACK and a 10 t towing winch, the CD core drill rigs for establishing circular work pits and bore holes as well as the GRUNDOBURST technique for static pipe renewal. Of course the GRUNDOMAT soil displacement hammer, with its approved technique particularly suitable for parallel bores with lengths up to 25 m and the trenchless installation of property service connections for FTTH/FTTX, gas water and electricity, was also part of the show.

Another highlight was the handover of a HDD rig type GRUNDODRILL^{18N} by Jean-Luc Davrout, the managing director of TRACTO-TECHNIK France to Cyrille Le Bihan, chief executive of the underground engineering company FTCS-Forage. A second GRUNDODRILL^{18N} was delivered to FTCS towards the end of August. Since its formation in 1997, the family-run business FTCS-Forage has evolved into an expert company for trenchless technologies, with an

emphasis on pipe installation using the HDD method. A total of 17 teams carries out steerable drilling operations with HDD systems of the midi and maxi class all over France. With this drilling method and auger boring, the specialists install an average of 50 km of pipelines per annum. In doing so FTCS not only take over the actual performance of projects; on customer's request, planning and projecting also belong to the complete package.

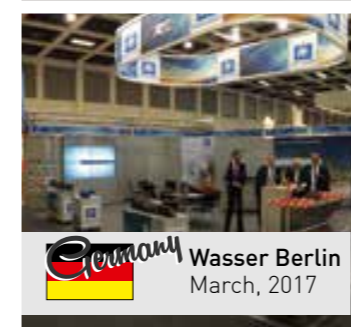
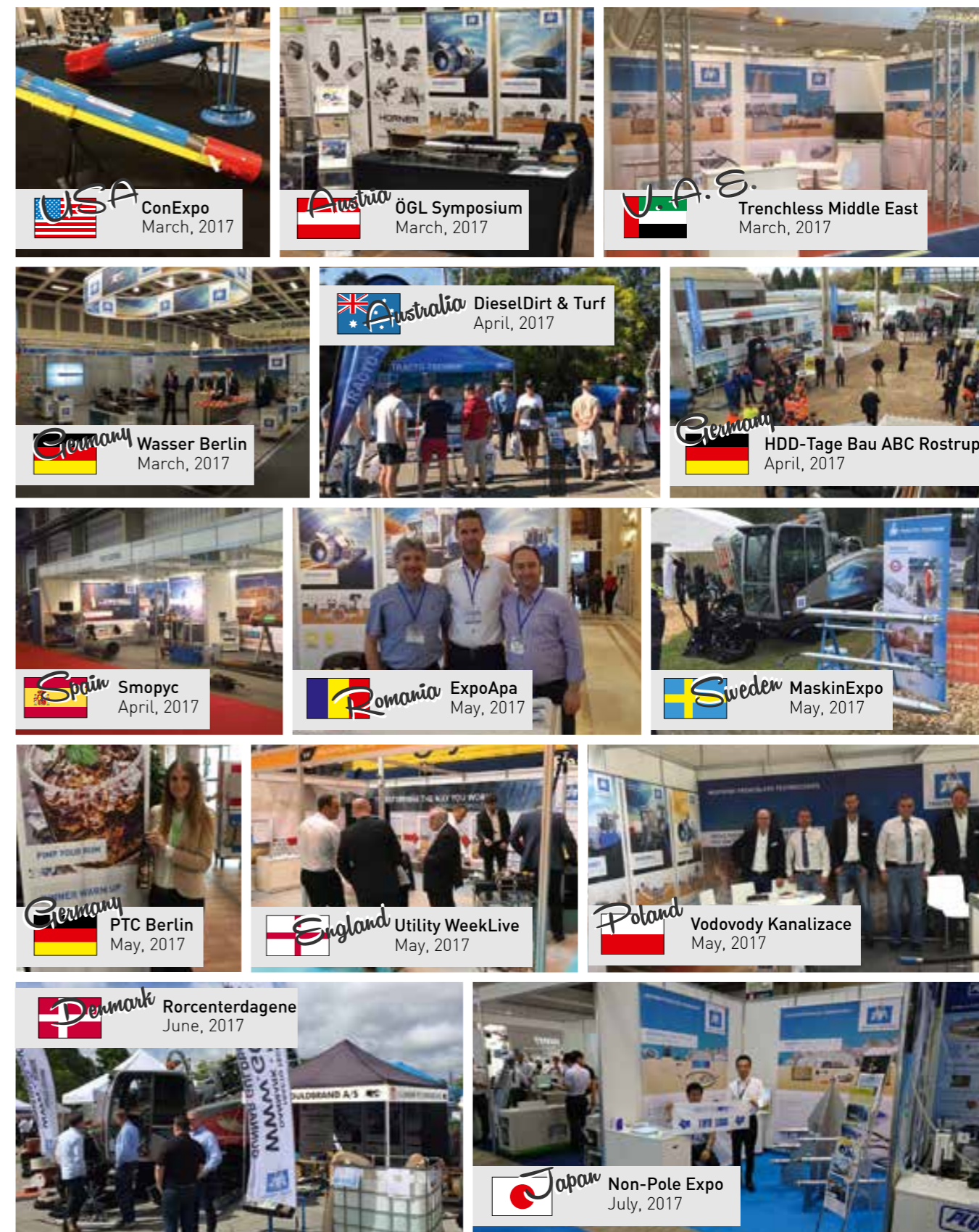
Jean-Luc Davrout was very pleased with the course of the trade fair. "Our innovative NODIG systems aroused great interest during the whole opening time of the trade fair. We are particularly happy upon having convinced FTCS-Forage



Jean-Luc Davrout hands over of the GRUNDODRILL^{18N} to Cyrille Le Bihan, chief executive of the underground engineering company FTCS-Forage.

of the quality of our HDD rigs; this company works with extreme professionalism within the area of steerable drilling and has mastered many sophisticated HDD projects very successfully." ♦

TRADE FAIR IMPRESSIONS





APRIL, 9.-14. 2018

Please mark this date in your calendar straight away! Exciting lectures, practical demonstrations and a trade exhibition are to be expected.

In addition, the Hands on Days also provide an excellent opportunity to foster and extend your network. You will receive further information within the next months. ♦

TRADE FAIRS 2017/2018

We look forward to seeing you!

11. - 12.10.17	Nodig-Event Nijkerk / Netherlands www.no-dig-event.nl	
23. - 25.10.17	WETEX Dubai / United Arab Emirates www.wetex.ae	
29.11.17	Fiberday Wien/Austria www.cmg-ae.at	
14. - 16.11.17	Smart City World Congress Barcelona / Spain www.smartcityexpo.com	
08. - 09.02.18	32. Oldenburger Rohrleitungsforum Oldenburg / Germany www.iro-online.de	
06. - 07.03.18	Symposium Grabenlos Loipersdorf / Austria www.grabenlos.at	
14. - 17.03.18	MAWEV Show Graz / Austria www.mavev-show.at	
23. - 28.04.18	Intermat Paris / France http://paris-en.intermatconstruction.com	
14.06.18	Trenchless Romania Bukarest / Romania www.trenchless-romania.com	
14. - 18.05.18	IFAT München / Germany www.ifat.de	
18. - 20.09.18	NO-DIG Live Peterborough / Gait Britain www.nodiglive.co.uk	

MORE POWER IN SALES



Olav Beisler



André Pitz



Tamer Kayan



Renke Praß

In line with the strategic company goals, important positions in the TRACTO-TECHNIK Sales Division have been re-assigned. In the German National Sales Organisation, competent successors have been found for the posts of Sales Manager, North and Subsidiary Manager, TT South.

Since 1 April 2017 Mr Olav Beisler works in national sales, assuming responsibility for the sales region North with an emphasis on HDD technology, currently in Mecklenburg-West Pomerania and Berlin (branch Berlin-Golzow). In the midterm he will succeed Klaus Arens who's responsible for the regions Hamburg, Schleswig-Holstein and parts of Lower Saxony. Heralding from Hamburg, Olav Beisler has been working in the construction machine industry for 30 years and has great experience in selling

TRACTO-TECHNIK products with a trading company and also as a project supervisor for HDD technology.

On 1 May 2017, Mr André Pitz started to work in national sales and was initially appointed manager of the TT South branch in Stuttgart-Altbach. Mr Pitz also has many years of experience in the field of construction machinery and will be succeeding Walter Schad, who will go into his well-earned retirement at the end of the year, on October 15 2017, (detailed report to follow). As head of national sales South Mr Pitz is in charge of selling HDD technology in Baden-Württemberg, Saarland as well as in parts of Hesse, Rhineland-Palatinate and Bavaria.

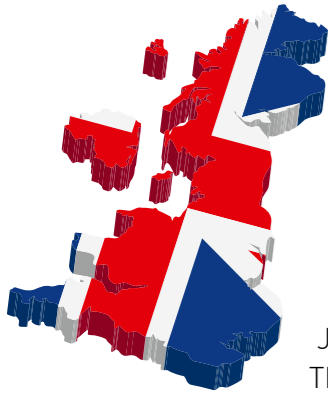
With a focus on a stronger presence on the international markets, the post of Distribution Development Manager has also

been assigned for the first time. Mr Tamer Kayan assumed responsibility as head of the newly created Distribution Development Department on 1 July 2017. He is responsible for maintaining and expanding TRACTO-TECHNIK's international dealer network. Tamer Kayan has worked in medium-sized companies for nearly 30 years and has many years of experience in strategic market development and internationalisation.

On 1 September, Mr Renke Praß joined the Order Processing department of our Customer Center North in Bakum.

These personnel measures are further important steps towards strengthening our sales structure and systematically developing our international markets. We wish the new additions to our team the best of luck and great success for their assignments! ♦

ALL THE BEST JIMBO!



Retirement of Jim Albarella at TRACTO-TECHNIK UK

Jim Albarella has worked for TRACTO-TECHNIK's UK sister company almost from the very beginning, highly appreciated by customers and colleagues alike. After an impressive career in different positions in customer services and training, "Jimbo" has retired at the end of June 2017. Jim started at TT-UK on 24th October 1988 as a workshop engineer repairing GRUNOMAT moles. He was then a demonstration engineer carrying out demonstrations and training of all trenchless equipment to existing and potential UK customers. These duties took him to various parts of the world including training in the overseas TT-UK sales territories.



In 1998 Jim became Customer Services Manager where he dealt with technical issues and parts queries across the complete range of products while still carrying out directional drilling training. Working as Customer Services Manager he set up exhibitions in various parts of the world such as Indonesia, Malaysia, Cyprus, South Africa, Saudi Arabia, Singapore, Kenya and India. Jim also worked on new products and innovations on keyhole technology for the utility industry. He played a key part in the training services of HDD techno-

logies to include the SGN iCore Project and the SPEN SIDD Mini Mole Project. For the iCore project, which is an innovative customised solution for mains and service replacement through a keyhole, Jim carried out the training of operators in Germany and Scotland over a period of 17 weeks together with Steve Robson.

Due to his broad professional expertise, Jim was appointed by the UKSTT in 2013 to discuss how the society can advise in training and all other trenchless technology applications. Since April 2017 he worked as product application specialist for TT-UK until taking early retirement on 30th June 2017.

Throughout all these years Jim has performed his various tasks with heart and soul, giving customers the best support possible where and when needed always being his number one priority. In doing so he contributed a great deal to the development of the market for trenchless technologies in the UK. His colleagues especially appreciated him for his kind manner and good sense of humour. The members of TRACTO-TECHNIK in England and Germany wish "Jimbo" all the best for a very long and happy retirement. ♦

CHANGE AT THE TOP FOR TT ASIA PACIFIC IN 2018



Successor for retiring Tom Hughes appointed



The retirement of Managing Director Tom Hughes at the end of this year will lead to a change at the top for TRACTO-TECHNIK'S Australian sister company TT Asia Pacific in Brisbane. Tom's successor is Jeffery Rose who

has been appointed for this important position in autumn 2017.

Jeffrey is a native Australian from Gold Coast in Queensland and a married father of two children. A consummate professional of the construction equipment world, the 55 year old engineer has spent most of his professional career with international equipment retailer Atlas Copco progressing through numerous managerial positions in sales and product management.

Tom Hughes, who's been successfully leading TT Asia Pacific as Managing Director since April 2000, is highly pleased with his successor. "Jeffrey was

the best choice among several highly qualified candidates - this goes for his professional qualification as well as for his interpersonal skills." he says.

Jeffrey Rose himself is happy to have such an exciting opportunity within the TRACTO-TECHNIK group of companies and says: "Having spent most of my working life in the construction equipment industry I'm aware of the huge potential for trenchless technologies in Australia and I am looking forward to working with the TT AP team in this new challenge".

We all wish Jeffrey Rose all the very best in his new role with TT Asia Pacific. ♦



DEVELOPING THE NEXT GENERATION OF "MOLES"



GRUNDOMAT soil displacement hammers for BAU-ABC Rostrup

Bau-ABC Rostrup is one of the most important training centres for young building professionals in Germany. This officially recognised training centre near Olden-

burg runs training courses and vocational programs in the various building professions. Their range of training courses covers the entire spectrum of building and

underground engineering from bricklaying and railway track construction through to specialised civil engineering. Naturally, trenchless technology is also covered in the training courses for future road construction workers and pipeline builders. For the practical sections of its courses, Bau-ABC also uses the moling technology of TRACTO-TECHNIK. The training centre possesses several GRUNDOMAT soil displacement hammers and adds to its inventory all the time.

In order to attract potential new staff to the construction sector, Bau-ABC organises its "Bautechnik-Tage" construction technology fair once a year, where a wide range of occupations are presented in practical demonstrations and technical presentations, allowing the industry to show off its repertoire. TRACTO-TECHNIK was also represented with a stand at this year's construction fair in June. At the event, Stefan Kruse, Area Sales Manager North of TRACTO-TECHNIK, handed over two new soil displacement hammers of type 130PK and 75P including full accessories (compressed-air hose, control unit, GRUNDOSCOPE, starting cradle, ram and add-on cones) to the course teachers. As an additional service, the experts of TRACTO-TECHNIK serviced the existing soil displacement hammers in the inventory of Bau-ABC. ♦



From right to left: Stefan Kruse hands over the GRUNDOMAT^{130PK} and ^{75P} including accessories to Hermann Greve, head of machine technology and metalworking technology, and Stefan Wiedenstried, road construction/pipe-line building teacher, of Bau-ABC-Rostrup at the 2017 construction fair.

burg runs training courses and vocational programs in the various building professions. Their range of training courses covers the entire spectrum of building and

"WE'RE PULLING IN THE SAME DIRECTION!"



Second "TRACTO-TECHNIK Group Meeting"



The managing directors of the worldwide TRACTO-TECHNIK group of companies gathered for the second Group Meeting at the headquarters of French sister company TRACTO-TECHNIK France in Paris from April 6 to 8, 2017. They met to review the progress of the strategic and operative measures for sustain-

able development of the group, which were initiated during their first meeting in December 2016. This time, the talks focused on the implementation of these measures in sales, marketing and service in order to support the customers and partners worldwide even more targeted and extensively. ♦

OFF TO SWEDEN

As part of a visit to the Lennestadt headquarters, a HDD drill rig was handed over to our Swedish customer UMA. Jakob Kesselberg of the Swedish sales partner Vretmaskin and TRACTO-TECHNIK product manager Manuel Pohl handed over the keys of a brandnew GRUNDODRILL^{18ACS} to UMA managing director Mattias Johannson together.

UMA has been specialising in trenchless technologies for more than five decades and is successfully working with TRACTO-TECHNIK products for many years. ♦



From left to right: Manuel Pohl, Mattias Johannson and Jakob Kesselberg.



"WE'RE STAYING PUT!"

TRACTO-TECHNIK continues to invest in German locations



After the official ground breaking ceremony for the start of construction of the technology centre, TRACTO-TECHNIK Owner/Managing Director Wolfgang Schmidt expresses his thanks to all parties involved. CTO Meinolf Rameil, CEO Timotheus Hofmeister and CMO Uwe Prinz as well as representatives of the architecture firm, the planning office and the construction company share his delight.

As reported in the last issue of Tractuell, TRACTO-TECHNIK is investing intensively in optimising and modernising the organisation and factory structure at its Lennestadt locations as part of a sustainable growth strategy. In March this year, work began on the construction of a new, ultra-modern logistics centre in Saalhausen, and in July, we celebrated the roofing ceremony of the new technology centre at Lennestadt-Langenei.

With a view to the long-term growth and strategic expansion

of the locations TRACTO-TECHNIK has also made another important investment and purchased the business premises of the former Schmelzer Sawmill on Winterberger Strasse in Lennestadt-Saalhausen. The company now has around 8,000 m² of additional space for future structural developments and modernisation measures directly at its headquarters.

GROWTH FACTOR INNOVATION

Innovation is very important for TRACTO-TECHNIK. To this day,

it has contributed decisively to our success and growth. To ensure that this continues in the long term, the Design as well as Research and Development Departments are being merged at the plant in Lennestadt-Langenei, and at the same time, assembly of all trenchless systems and the construction of the logistics centre at the headquarters in Saalhausen are being amalgamated.

In order to combine these departments, the existing build-



View of the future technology centre in Lennestadt-Langenei with the new office building in the foreground and converted development workshop in the background.

ding on the street "Zur Lehmkuhle" in Langenei will be thoroughly modified and extended by adding a new office building. This new technology centre with a usable area of around 1,520 m² will be the workplace for a total of 60 engineers, designers, technical draughtsmen and mechanics. "We will concentrate our expertise in design, research and development in the new technology centre in order to extend our innovative lead in the long term," said the proprietor and Managing Director Wolfgang Schmidt.

SPEEDY CONSTRUCTION PROGRESS

Construction work for the new office building at the technology centre started on schedule with the official ground-breaking ceremony by the management of TRACTO-TECHNIK on 19 May 2017. Just two months later, on 21 July, the roofing ceremony was celebrated. The fact that the visible construction work has progressed so quickly is due to the solid wood construction of the new building. Apart

from speed, this construction method also scores with its environmental friendliness. Wood construction is especially energy-efficient and provides a very pleasant room climate for the staff.

IMPORTANT STEP TOWARDS IMPLEMENTING THE FUTURE VISION

Construction of the new technology centre is – alongside the building of the ultra-modern logistics centre at Lennestadt-Saalhausen – one of the milestones of the modernisation and growth strategy that should make TRACTO-TECHNIK fit for the future. "Step-by-step, our vision for a successful future is starting to take shape. The roofing ceremony at Langenei is another important step along the way and a recognisable sign of our progress," explains Wolfgang Schmidt, clearly delighted.

OPTIMUM CONDITIONS

In parallel to the construction of the new office building, the existing building will be converted into an ultra-modern,

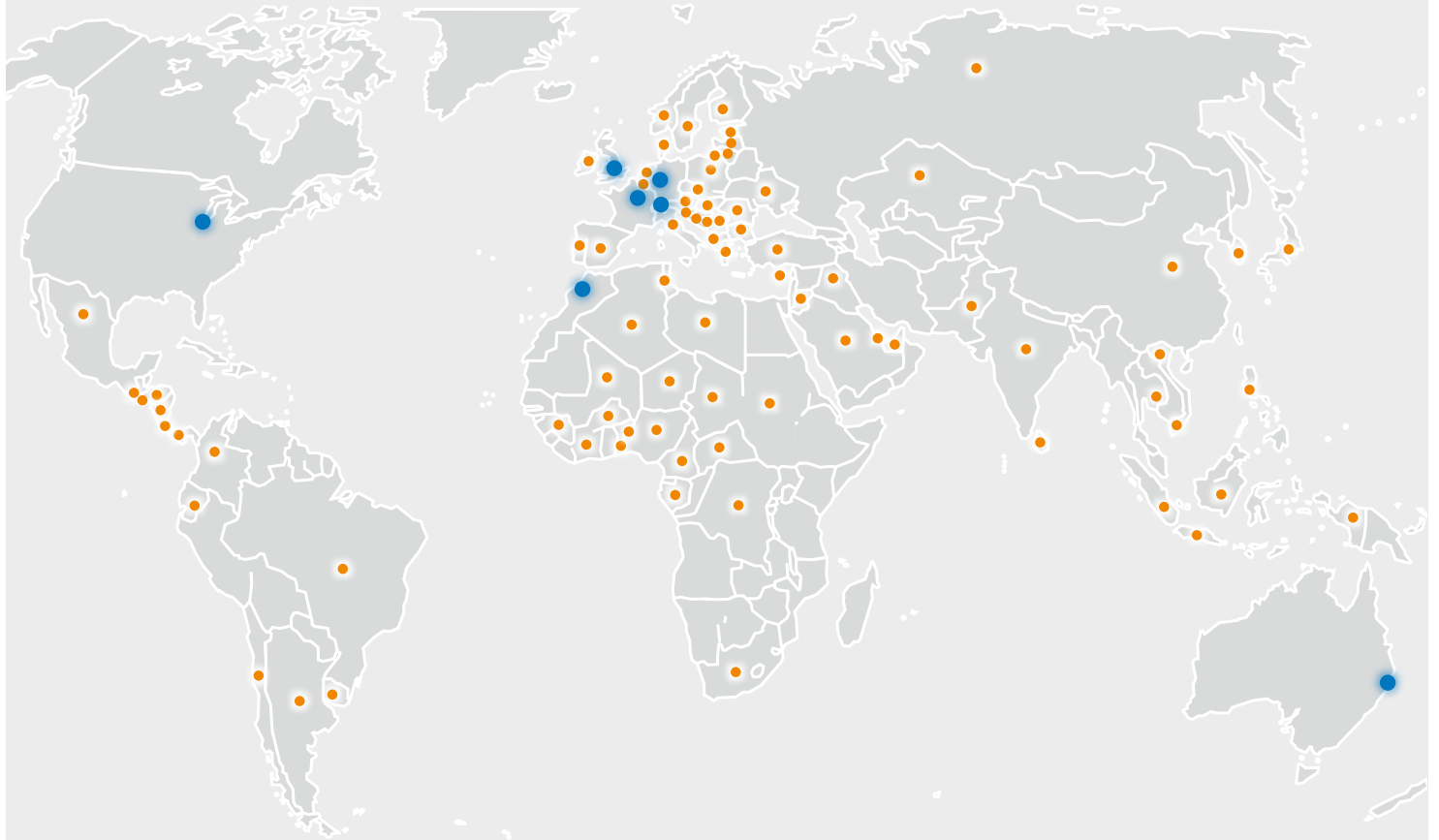
large-area development workshop in which the prototypes of all NODIG systems will be built, tested and developed to series maturity. After completion, the workshop building and the structurally connected office building will together form the new technology centre. "We are already looking forward to our new home, which will give us the best possible conditions for turning our ideas about the bore rigs of the future into marketable products with pioneering new functions," explains Meinolf Rameil, Director of Research and Development.

SCHEDULED COMPLETION

Assuming that all construction work continues so smoothly, the new technology centre and the new logistics centre will be handed over as scheduled on 21 December this year. These extensive investments for TRACTO-TECHNIK are the next important steps into a successful future and are also a clear commitment to the regions surrounding Lennestadt. ♦

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