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TURNING THINGS AROUND

BUCHEN and XERVON delivered outstanding results during two parallel shutdowns – deploying over 1,000 employees from a whole range of specialist fields

Services

Customers honour excellent workplace safety standards

International

BUCHEN cleans an unusually large tank in the easternmost part of Russia

Group News

HEINZ PULS delivers industrial cleaning services to an offshore platform

Work safety practices honoured

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EDITORIAL

Dear Readers,

The term "shutdown" is really not the best choice of word for describing what our customers and we do during a major turnaround. The only thing that has been shut down is the facility itself – everything else around it is a hive of activity. In fact, work begins months before a shutdown is due to take place as everything has to be meticulously planned and organised and all possible parts produced in advance so that the plant can be up and running again in as short a time as possible.

BUCHEN and XERVON took part in two major shutdowns earlier this year – both at the same time. All in all, the two companies deployed around 1,200 employees over this four-week period to carry out a whole range of different tasks. Very few companies in Germany are able to take on such a mammoth project. Read our feature article to find out how we succeeded in doing this.

Another thing that creates a hive of activity at our company is our desire to solve our customers' problems and find bespoke solutions that meet their exact requirements. We are constantly working on further improving our services by developing technical innovations that make processes even more efficient. We have come up with a number of smart ideas for a range of different applications. From closed loop processes, to getting maintenance work fit for the future with condition monitoring, all the way through to creating our own complex technological developments such as the dense phase conveyor system and our very own industrial cleaning robot, the automated industrial cleaner (AIC).

No matter what development we may be looking at, our focus is always on improving workplace safety. As a result, we have launched a variety of product innovations onto the market recently that makes working in boilers much safer. We have also been awarded a number of work safety prizes from our customers – demonstrating that this subject

is just as important for them as well. And we are happy to admit that we are extremely proud to have been awarded these. They are proof that our ongoing efforts to improve work safety are bearing fruit. Whether it be RWE, EVONIK or Covestro – to name just a few – they have all commended us and thanked us for the hard work we carry out in this area. We, too, would like to say a big "thank you" to them: for giving us these awards and giving us the opportunity to work with them. We are also doubly proud because we operate in such a wide range of fields, all of which – such as tank cleaning work – have their own particular hazards and risks. Our experts are in high demand both for onshore and, in particular, offshore projects. From the North Sea to the easternmost region of Russia: our customers like to make the very most of our in-depth know-how and specialist technology.

What's more, the latest scaffolding projects in Sweden and Austria clearly demonstrate just what a name XERVON has made for itself as one of the leading European scaffolding businesses. Both projects involve extremely complex requirements, whether it has to do with weather protection or special anchorage solutions. In fact, we are well-known for delivering specialty scaffolding solutions in all of the countries we operate in. Which was one of the reasons why we invested in our scaffolding business in the German town of Eisenhüttenstadt. With both the workforce and workload having expanded over the last few years, we decided to invest in our employees, in our customers and in the region as a whole.

By the way: we have now published a digital version of our up2date magazine. Why not take a look and discover even more interesting facts about our company and services? No doubt you'll get to read about a service that you perhaps hadn't known about before and which might even be an option for your own business!



[up2date-online.de](https://www.up2date-online.de)

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Successful team work

TWO MAJOR SHUTDOWNS IN 2017: PERFECTLY PREPARED, PERFECTLY EXECUTED

A quick summary to start off with: the two refinery turnarounds in Vienna-Schwechat and Lingen, which had been meticulously prepared in advance by XERVON and BUCHEN, were successfully completed without a single accident. Intensive preparation work had been needed beforehand – with both turnarounds being held at the same time – and this is exactly what the maintenance experts, industrial cleaners and catalyst specialists did. And it was well worth it: the approx. 1,200 operatives deployed to carry out the various specialist tasks performed their work professionally and efficiently.



All in all, around 3,000 specialist staff were on site to carry out the repair and maintenance work

“We received much praise from our client for the professional way we executed our tasks,” commented Thomas Kramel, managing director of XERVON Instandhaltung GmbH based in Münchsmünster. His team was responsible for carrying out the extensive mechanical work during the turnaround at the OMV refinery in Schwechat near Vienna, one of the largest inland refineries on the European continent. One of its most important facilities – its ethylene cracker unit – had to be shut down between the end of April and the end of May so that it could be serviced and inspected. All in all, around 75 percent of the refinery came to a standstill for a period of four weeks and approx. 3,000 specialists were called in to perform any necessary repair and maintenance work.

XERVON had also been involved in the refinery’s last shutdown, which had taken place six years ago. They had, therefore, already been able to demonstrate the high quality of their work, their reliability and their ability to keep to agreed schedules – three main reasons why the maintenance specialists were commissioned to do the work again in 2017. “We sent a team of almost 400 people this time. They were responsible for dismantling a whole range of plant sections and equipment – such as heat exchangers, columns, storage vessels, oil coolers, machines etc – and then, of course, putting them back together again,” said Thomas Kramel explaining the complex workload faced by XERVON’s team of mechanics.

“We received much praise from our client for the professional way we executed our tasks.”

Thomas Kramel, Managing Director XERVON Instandhaltung GmbH

One of the main challenges they had to cope with – besides having to complete their various tasks within a very tight schedule – was dealing with the actual layout of the refinery. “Some of the refinery’s facilities, such as the ethylene cracker unit, have been built upwards to make up for the lack of area available. This meant that great thought had to be put into how to dismantle the machines as there was so little space to manoeuvre in. More often than not, we couldn’t use cranes as there simply wasn’t enough space for them. In many cases, we had to work with chain lifts – also for moving really large parts weighing between two and three tonnes. And then they had to be transported to a section of the refinery where they could be lifted out by crane,” Thomas Kramel continued illustrating the tricky conditions they had to face at the site.

XERVON had begun planning this project back in September 2016. One of the priorities here was coordinating the various different tasks that had to be carried out on each piece of equipment, such as the scaffolding, insulation, piping and cleaning work. It was essential that everything ran smoothly – and the mechanics played a key role here.

After almost nine months of intensive planning and preparation, work finally got underway at the end of April: divided up into around 40 teams of mechanics, the XERVON (and other) specialists travelled to the refinery to give their best. It goes without saying, of course, that the company’s own team of specialists are not able to carry out such large-scale projects on their own. When organising major turnarounds – especially when two or more are due to take place at the same time – XERVON Instandhaltung calls on its extensive network of reliable and long-standing partner firms whose operatives are managed on site by XERVON and who always meet XERVON’s high work standards.

BUCHEN-ICS, who specialise in reactor and catalyst handling services, were also at the turnaround in Schwechat to perform a number of different jobs. One of their main tasks was to replace the catalyst in 15 vessels and reactors with the majority of this work being performed in a nitrogen environment. All in all, they used their specialist processes to unload and load around 400 cubic metres of material.

Large-scale shutdown at BP in Lingen

The major turnaround at BP’s refinery in Lingen, which lasted from the middle of April to the beginning of June, was also a great success. As with the project in Vienna, planning had to begin well in advance with BUCHEN and XERVON working hand in hand here. BUCHEN UmweltService was responsible for all the industrial cleaning work needed at the refinery throughout the turnaround, BUCHEN-ICS worked on over 30 reactors and XERVON took on the extensive piping and mechanical tasks. In addition, they were in charge of installing all the pipes in a new 45-metre-high column (for distilling crude oil), which was also built during the turnaround period.

XERVON produced and installed several thousand metres of process and product piping for BP Lingen, set up trace heating systems and manufactured several thousand flange joints – a series of highly complex jobs that not only had to be meticulously planned beforehand but also involved many parts having to be produced in advance.

“We started producing the parts, so-called pipe spools, back in the middle of 2016. If we hadn’t done this, it would have been impossible to complete the work within the tight schedule,” explained Tobias Wilming, manager of XERVON Instandhaltung’s branch in Lingen.

The greatest challenge during any turnaround is coordinating the work schedule each day and making any adjustments where necessary

XERVON had up to 450 operatives working on the pipes at the refinery during the busiest times of the shutdown; a further 250 employees were deployed to do the mechanical work, i.e. dismantle and reconnect various plant sections and equipment such as columns, heat exchangers and fittings. Each day, they had to consult with the other specialists on site to coordinate their various tasks – no matter how well such a turnaround is planned in advance, there are always jobs that take longer than expected or indeed are completed more quickly.

“Around 80 to 85 percent of all tasks are completed as planned, the rest have to be sorted out on the spot,” estimated maintenance specialist Tobias Wilming, a figure that was confirmed by his colleague Thomas Kramel. This means that everyone on site needs to be extremely flexible – and this is the secret behind ensuring such turnarounds are completed to schedule. This also explains why clients such as BP prefer to rely on high performance service providers who have both the manpower and the technical equipment to be able to react flexibly no matter what task may crop up. “What’s more, we know the refinery’s day-to-day operations as we have been providing them with a number of different services for several years now. Thanks to these service agreements, we know where all the buildings and roads are which means we can draw up the best solution for the various tasks,” continued Tobias Wilming.

His colleagues from BUCHEN UmweltService are of exactly the same opinion. This sister company has been delivering services to BP’s refinery in Lingen for roughly the same amount of time, carrying out any industrial cleaning work that needs doing. The team at BUCHEN Ruhr region’s branch in Bramsche, which is responsible for Lingen, all agree that “no matter whether it involves an everyday task or helping out during a turnaround, what is important is to deliver high quality work, ensure there are no accidents, protect the environment and complete the job within the fixed budget and timeline”. Having taken part in a similar shutdown at the Lingen refinery back in 2006, they were able to make the most of this experience when planning for this one.

Their workload during this latest turnaround, however, was considerably larger. The plans for this shutdown (TAR 2017) included cleaning numerous heat exchangers, vessels, columns, reactors, air coolers and pipes of varying diameters. A whole range of special cleaning methods had to be deployed here – from diverse environmentally friendly vacuuming processes (for both solids and liquids), to high pressure jet washing systems, dry ice blasting technology with CO₂ pellets and blasting systems using modified sodium hydrogen carbonate (better known to non-professionals as bicarbonate of soda), all the way through to setting up dedicated washing areas for cleaning, for example, heat exchanger bundles. Moreover, vacuum/cleaning trucks were used as were gas scrubbers, air conveying systems, mobile high pressure blasting units and a number of mobile water filtration units that enabled water from the River Ems to be used for the pressure tests.

“80 to 85 percent of all tasks are completed as planned, the rest have to be sorted out on the spot.”

Tobias Wilming, Manager of XERVON Instandhaltung’s Lingen Branch



The pipes leading to the crude oil distillation facility in Lingen



The vacuum distillation unit in Lingen

BUCHEN's regular team had had the machines and vehicles delivered from across the country to enable this major project to be completed – and had called on their colleagues, who knew how to use this equipment, to come along as well. They were even supported by their colleagues in Poland and Estonia. "During the busiest periods we had up to 240 people on site – we were helped out here by our colleagues from many different regions as well as from our partner companies," explained the three BUCHEN managers in charge of this project. "The operatives were divided up into teams which were then assigned to the day or night shifts – if necessary they also worked at the weekend and on bank holidays. By planning the work this way, we are able to be flexible and respond to any unexpected changes in the schedule." Each morning, the different specialists consulted with one another and each midday an in-house meeting was held to ensure that the different jobs were carried out smoothly and in the best possible way despite any unforeseen delays.

According to the BUCHEN-ICS experts, "the greatest challenge during any turnaround is coordinating the work schedule each day and making any adjustments where necessary". During this particular turnaround, they had up to 60 employees working on up to five reactors at any one time to unload and load the catalyst. They also used their newly developed dense phase conveyor system (DPC) to load the hydrocracker plant for the first time (see our report on page 28). A successful start for this alternative catalyst-loading system – a process that does not need a crane and can be used no matter what the weather.

Not unexpectedly, space is always an issue during such turnarounds. The amount of people and equipment on the refinery grounds was huge as around 85 percent of all the shutdown work in Lingen was carried out during the day. BP had set up an excellent infrastructure for their contractors to cope with these numbers and both BUCHEN and XERVON were highly impressed by the results. Thanks to the facilities provided, the companies were able to take sufficient staff and equipment to the site, helping to make sure that all tasks were completed according to schedule. As communications and coordination between the different service providers were equally important, BUCHEN and XERVON made sure they were close to one another in the container village and had got to know each other personally before the project actually began. "If something didn't quite go as planned then we could sort out the problem among ourselves without having to involve the client. It also helped create a team spirit and bind the individual team members closer together," said both the BUCHEN and XERVON colleagues.

What is clear is that it is only possible to complete a turnaround successfully if everyone works as a team. All of the different types of work must be coordinated so that everything runs like clockwork, simply because everyone depends on everyone else. Whilst good planning is important, the way each operative actually performs their work is vital – no matter which task they may have to carry out.

The excellent infrastructure set up by BP made it possible for the companies to take sufficient staff and equipment to the site

Safe, clean, fast

NEWLY DEVELOPED AUTOMATED SYSTEM FOR CLEANING HEAT EXCHANGERS IS PARTICULARLY ENVIRONMENTALLY FRIENDLY

BUCHEN's cleaning specialists have developed a bespoke solution for one of their clients – an innovative, closed loop system for cleaning tube heat exchangers that is practically emission free.



Cleaning the inside of the heat exchanger



Extracting the mixture from the base of the heat exchanger

The task the company was given to solve was both exciting and challenging: a vertical tube heat exchanger containing an environmentally hazardous product needed to be cleaned using a process that was safe, efficient and in line with the strictest of safety conditions – and preferably one that caused no emissions whatsoever.

The engineers at BUCHEN UmweltService's branch in the German city of Stade approached the problem from a completely new angle and came up with the successful concept of creating a closed loop system. This automated system consists of a clever combination of cleaning and extraction processes that enables the heat exchanger to be cleaned so that there are practically no emissions. What's more, the heat exchanger does not need to be dismantled beforehand – it can remain on site in the plant. Thanks to this new method, the operatives do not have to wear full-body hazmat suits with self-contained breathing apparatus.

So how does it work? An automated device with flexible lances is placed on top of the heat exchanger which is then used to clean the inside of the tube bundle. The problematic water-product mixture generated by this cleaning process is simultaneously suctioned out of the heat exchanger using a closed loop process – reducing potential air emissions to an absolute minimum.

Besides suctioning out this mixture, a vacuum is created around the whole of the heat exchanger's lower dome further reducing the risk of gas or the product-water mixture escaping into the atmosphere. Both material streams (product mixture and exhaust air) are then fed into an exhaust air scrubber via a vacuum/cleaning unit with a water-ring air pump.

A further advantage of this closed loop cleaning system is that it has hardly any impact on the immediate surroundings. This means that it is no longer necessary to set up scaffolding covered in tarpaulin around the heat exchanger to prevent the area from being contaminated by water spray. The time-consuming work of cleaning the surrounding area is also a thing of the past.

This environmentally friendly closed loop system is suitable for cleaning all types of heat exchangers – horizontal or vertical – where it is essential that the gas or water-product mixtures do not escape into the environment. The BUCHEN experts are able to adapt this innovative process to suit the exact requirements of their customers.

The BUCHEN experts are able to adapt this innovative process to suit the exact requirements of their customers

This automated system consists of a clever combination of cleaning and extraction processes that enables the heat exchanger to be cleaned so that there are practically no emissions.

What's more, the heat exchanger does not need to be dismantled beforehand

Work safety practices honoured

COVESTRO PRESENTS ITS SAFETY AWARD TO XERVON'S SCAFFOLDING SPECIALISTS

Erecting work platforms and protective scaffolding high above the ground or in areas that are particularly difficult to access is a great challenge, particularly in the industrial sector. The industrial service provider XERVON, which is also the largest scaffolding business in Germany, is able to do precisely this. What's more, it always works in line with the most stringent safety standards – with not a single accident in 2016. This excellent workplace safety record has now been honoured by Covestro who recently presented the company with its Contractor Safety Award.



This was the third time that Covestro has presented this award to external partner firms who have demonstrated outstanding levels of work safety at its production sites in the German state of North Rhine-Westphalia (NRW). The prize was handed over to Klaus Thiele, managing director of XERVON GmbH responsible for scaffolding across Germany, by Klaus Jaeger, Covestro's NRW site manager, and Georg Wagner, head of QHSE in NRW, during a special ceremony held in Krefeld-Uerdingen. At the same time, the XERVON employees were invited to a special lunch at the company's branches in Leverkusen and Dormagen to thank them for their hard work – with hamburgers all round for the 70 or so colleagues.



A strong partnership for over 40 years

XERVON has been working successfully with Bayer MaterialScience, now Covestro, for over 40 years. Covestro had planned a number of major shutdowns last year, all of which needed scaffolding so that the facilities could be maintained and serviced – including shutdowns at its Dormagen and Uerdingen plants. "The performance of the employees here was truly impressive," said Klaus Jaeger, praising the team. "Not only did they not have a reportable accident in 2016, they didn't even have a single first aid case. This really is only possible if everyone works as a team and has each other's backs."

"We are really proud to have been given this award. Our goal is, of course, to maintain these high safety levels," explained XERVON managing director, Klaus Thiele. XERVON holds regular training courses, continuously improves its fall arrest and personal protective equipment (PPE) and systematically implements its work safety management system to make sure that the whole subject of safety is permanently at the forefront of everyone's minds.

Looking forward to continuing their safe work together in the future: the XERVON team and their client, Covestro



“The performance of the employees here was truly impressive.”

Dr Klaus Jaeger, NRW Site Manager at Covestro

“Our number one priority at XERVON is keeping our employees safe and this is a fundamental part of XERVON’s business strategy,” Klaus Thiele continued. “Our collaboration with Covestro is particularly constructive. We often sit down together to discuss how processes can be further improved and then ensure these ideas are integrated into the next project.”

XERVON Managing Director, Klaus Thiele, (right) receiving the 2016 Contractor Safety Award on behalf of all his employees from Covestro’s NRW Site Manager, Dr Klaus Jaeger



Covestro put on a special lunch to thank XERVON’s scaffolding team for their high work safety standards

XERVON scaffolding acts as a stage for the ‘Covestro Graffiti’

One particular highlight of the long-standing partnership between Covestro and XERVON is an impressive piece of art: the mobile ‘Covestro Graffiti’ (ca. 30 metres wide and three metres high) has been hung on XERVON scaffolding and is currently on show next to Gate 10 in Dormagen. The colourful inscription on this transportable artwork aims to convey the message that Covestro is inquisitive, bold and versatile. XERVON “supports” these values in every sense of the word.

An award-winning performance

XERVON’S SCAFFOLDING SPECIALISTS ALSO RECEIVE A SAFETY AWARD FROM EVONIK

This year, Evonik presented its 2016 Partner Award at its plant in Hanau for the very first time – and it was presented to XERVON’s scaffolding experts in recognition of the excellent cooperation work between the two firms and their outstanding workplace safety. Their performance had been evaluated by a number of people working on site in the areas of, for example, technology, production, occupational safety and plant security.

The work of the contractor businesses is assessed over a fixed period of time and then the best three firms selected; XERVON made it to 1st place and was presented with the award and certificate by the local Evonik management team during a special ceremony held in May. This prize is yet more proof of just how important safety is at XERVON, also in a challenging business such as scaffolding – something that is also being recognised and honoured by its customers.



From a safe distance

BUCHEN DEVELOPS A ROBOTIC SOLUTION FOR THEIR AUTOMATED JET WASHING SYSTEMS

Health and safety play a pivotal role at BUCHEN – which is why the company places such importance on developing its own technology to further improve safety standards. Thanks to its latest innovation, a robot with an automated high pressure jet washer, the company has once again improved the working conditions for their industrial cleaning specialists.



Cleaning by hand with a handheld high pressure jet. The operatives must cope with a recoil of around 15 kilogrammes the whole time they are using the equipment. This problem is eliminated with the robot

No matter what the field, BUCHEN relies on equipment that provides an ergonomic working environment and guarantees the highest levels of work safety

No matter whether it be oil refineries, chemical businesses or heavy industry: if their machines need cleaning, then high pressure water jet systems with handheld lances are often deployed to perform the work. This carries a number of risks for the industrial cleaning experts – firstly because the water jet is so powerful and secondly because the spray generated obscures their vision. What's more, there is the added uncertainty of the potential risks of the product residue and hazardous substances dislodged by the process.

These were, therefore, all good reasons for BUCHEN UmweltService to look at and improve the technology being used. The company's own technology department spent a good three years developing a robot that enabled high

pressure jet cleaning work to be automated. The result: its automated industrial cleaner (AIC).

Upgraded equipment = greater safety

At the heart of this AIC system is an industrial robot, one of the first in the world to be adapted to carry out mobile industrial cleaning work using high pressure technology. The robot is controlled with a joystick – by an operator sitting in the control centre (container) well away from the danger zone. The patent-pending AIC and its controls are operated intuitively by the person in charge. An additional concept monitoring the area of work and preventing the machine from being damaged makes it even safer to handle.

What was really important for BUCHEN was to develop a process that was easy to use: the system is operated intuitively and has a joystick that controls the robot's axles so that the jets can be placed exactly where they are needed

Perfectly adapted to its area of use

The industrial cleaning specialists use a panel to control the AIC's high pressure jet washer and can alter it to meet the local conditions by selecting the most suitable pre-defined program. Alternatively, they can program the exact movements the robot should take or take full control of the jet nozzles themselves by using the joystick.

In order to extend the areas it can be used in, a number of different cleaning tools can be attached to the arm of the robot. These include surface cleaners, spray bars and pipe washer heads as well as a nozzle similar to a manual high pressure lance. The distance it should be from the actual part being cleaned can be entered into the system beforehand and depends on how many deposits need to be removed. All these different options make it an extremely flexible system that can be adapted to meet the customers' exact requirements.

Safe work & excellent results

There are a whole host of advantages to deploying this robot. First and foremost, it further improves safety levels. All the potential risks operatives may face in the danger zone simply no longer apply as they do not need to enter the area. At the same time, the ongoing physical strain of manual cleaning work is reduced. This is especially true when it comes to the powerful recoil caused by the high pressure jet. Industrial cleaning specialists working with handheld high pressure lances have to cope with a recoil of 15 kilogrammes and this increases to 25 kilogrammes if they are using jets that have a shoulder support. In contrast, the AIC system is effectively a back-friendly "desk job" in an air-conditioned container where they can carry out their work safely either sitting or standing.

The AIC uses a ratio of pressure and water volume that produces particularly effective cleaning results. When used to clean surfaces, for example, it achieves a water throughput of up to 190 litres a minute at a pressure of 1,000 bar.



"The high performance achieved by the AIC is an important add-on – and further underlines our belief that high work safety standards always benefit the quality and cost-effectiveness of our work."

Kevin Seik, BUCHEN UmweltService's head office technology department

Moreover, the same high quality cleaning results are reached as the distance between the jet and the part being cleaned remains the same throughout. The mobility of the robot creates further advantages – especially for cleaning work which operatives would have to do overhead or from an elevated position. Kevin Seik from BUCHEN UmweltService's head office technology department commented: "The high performance achieved by the AIC is an important add-on – and further underlines our belief that high work safety standards always benefit the quality and cost-effectiveness of our work."

Certification in accordance with ISO:9001, SCCP and OHSAS 18001 – health and safety are extremely important at BUCHEN



The automated industrial cleaner developed by BUCHEN creates a really safe working environment

All round protection

XERVON IS NOW OFFERING ITS INSULATION SERVICES IN THE NORTH OF GERMANY AS WELL

XERVON GmbH recently opened a new sales office in Hamburg in order to grow its business in and around the city as well as in the states of Schleswig-Holstein and Lower Saxony. Two project managers and a team of operatives are there to offer the company's wide range of services covering thermal, cold, acoustic and fire protection insulation – either for individual projects or as part of a service agreement.



XERVON is one of the very few companies in Europe able to insulate tank wagons



Branch manager, Frank Würzburg, commented: "We've got a great set-up here, both in terms of personnel and technical equipment. We are more than ready to serve the north of the country and have in fact already completed a number of projects." The company has, for example, carried out extensive insulation work for a manufacturer of medical grade white oil and Vaseline based in Hamburg. "This was a large-scale project involving numerous tanks and the customer was more than happy with the results. We probably couldn't have a better reference for future tank renovation and tank extension projects," Frank Würzburg concluded.

XERVON has in-depth knowledge of the different types of industrial insulation needed by the processing sector. This goes way beyond conventional pipe insulation. Whether it involves storage tanks or turbines, pumps or pipes, fittings or ventilation systems – XERVON has the right processes and materials to meet their customers' specific requirements, no matter how complex the task. It is, for example, one of the very few companies in Europe able to insulate tank wagons.

Now available on site for its customers in the north of Germany: XERVON's new industrial insulation office in Hamburg

In fact, bespoke solutions are needed no matter what type of insulation is being installed as it always has to be adapted to ensure it meets the local conditions. Which is why XERVON offers its customers the full of range of services – from providing professional advice, to taking on the detail design engineering and the logistics (including supplying staff and material), all the way through to installing the materials at the plant.

The company's portfolio comprises thermal insulation for both normal and high temperature environments; cold insulation using standard or customised materials; fire protection measures in chemical and petrochemical plants, power stations and office buildings; as well as acoustic insulation for pipes, pumps, gas and steam turbines and ventilation systems.



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XERVON's insulation specialists are able to develop a whole range of solutions for their industrial customers, including bespoke solutions for insulating tank wagons



Cleaning tanks and maximising oil recovery

THE BUCHEN SPECIALISTS CLEAN AN UNUSUALLY LARGE OIL TANK

Thanks to BUCHEN's engineers, who have optimised the company's automated tank cleaning systems, it is now possible to not only clean large-scale tanks really quickly and effectively but also to recover exceptionally high volumes of the tank's product from the sludge. A recent cleaning project demonstrates this perfectly, with BUCHEN succeeding in recovering a huge amount of oil from the sludge that had been removed from a 105,000 cubic metre crude oil tank.



With a diameter of 91 metres and a nominal capacity of 105,000 cubic metres, this is one of the largest oil tanks in Europe. This massive structure has now been successfully cleaned by the specialists from BUCHEN Tank- and TurnaroundService GmbH as part of the tank's regular maintenance programme. The BUCHEN project managers know exactly why their company had been commissioned to do this particularly complex cleaning project: "We are the only business in the sector that has automated tank cleaning systems that are able to produce efficient results and cope with the huge volumes of sludge found in tanks of this size."

The numbers speak for themselves: over 11,000 cubic metres of sludge were removed from this huge container during the tank cleaning procedure. The work was carried out day and night and, if the installation of the equipment, rinsing and fine cleaning work are taken into account, took several months to complete. You would be wrong, though, if you thought the sludge could simply be sent on for disposal: its contents were far too valuable – by the end of the process, oil worth a seven-figure sum had been recovered. BUCHEN then used its own highly efficient upgraded version of the so-called BTS BLABO® jet washer system to clean the huge tank.

This innovative process is one of the most powerful closed-loop, automated tank cleaning systems currently available on the market. This computer-controlled technology operates at pressures of up to 12 bar and is fully automatic. A BUCHEN specialist went into more detail: "We looked at what our individual customers needed and then upgraded these closed-loop, automated tank cleaning systems so that we can meet their specific requirements. Manual cleaning work is hardly ever needed anymore. This also means our customers have lower disposal costs as we are able to recover a high percentage of the product stored in the tank from the sludge." These cleaning systems are placed in mobile containers which can then be transported to and installed on site at the customer's plant. As part of its work, BUCHEN also supplies the electricity, steam, nitrogen and any other media that may be required.

For the most part, the washer and cleaning nozzles used by this innovative technology are inserted into the tank via the openings that are already available – such as the liner tubes in the roof supports, manway hatches or even sampling sockets. In this project, for example, a special structure had to be installed over the tank's roof to prevent it from being damaged whilst the cleaning equipment was being set up. The customer had an added bonus here as the equipment installed on the tank could also be used to pump out and process the almost 300 cubic metres of residue from a nearby desalination plant – a fast, uncomplicated and highly practical solution.



Visually inspecting the BTS Blabo® jet washer system

What was noticeable throughout the project was the excellent cooperation work between BUCHEN and its customer. Top of the list of priorities here were work safety and environmental protection. The joint risk assessments carried out for each stage of the work certainly ensured that the project was completed efficiently and without a single accident.



The contents of the sludge were far too valuable to be simply sent on for disposal – by the end of the process, oil worth a seven-figure sum had been recovered



The nitrogen evaporator used to create an inert atmosphere in the tank

Investing in the future

XERVON INVESTS IN ITS SCAFFOLDING BUSINESS IN EISENHÜTTENSTADT

With the building work completed, XERVON's scaffolding specialists in Eisenhüttenstadt were able to move into their new offices at the beginning of March and are now enjoying working in this new and modern environment. A ceremony was held, of course, to officially open the building which also included a programme of interesting events for all those attending.

The company's scaffolding branch in Eisenhüttenstadt has a long history that goes all the way back to when it was part of East Germany and delivered services to the local steelworks, Stahlwerk Eisenhüttenkombinat Ost (EKO). This steel mill still exists today, operating under the name ArcelorMittal Eisenhüttenstadt GmbH, and XERVON's scaffolding experts are now well-known for their high quality services across the whole of the region. They have been working from their offices in Seefichtenstraße since 1994. The company has now once again invested in the future and built a modern, two-storey office building just 30 metres from their old one.

This new building has plenty of space for the team, which has expanded rapidly over the last few years: modern changing rooms, storage rooms and staffrooms with a kitchenette can be found on the ground floor, whilst the first floor is home to offices (with the latest computer technology) and a large meeting room that can hold up to twenty people. Branch manager, Torsten Schenk, commented: "We all love working in the new building. The large conference room is also really useful – in the past we always had rent a room elsewhere if there was a large group of us meeting." He even went a step further saying: "I'm confident that this new building will help further increase the standing of the scaffolding business in the region."

Branch manager Torsten Schenk (far left) and his team are very proud of their new offices





The guests were amazed by the many different demonstrations and scaffolds – scaffolding really is an exciting business!

There was, therefore, good reason to celebrate the opening of the new offices and this is exactly what the team did at the beginning of March – putting on an all-day event for all those wishing to attend including company representatives, employees and their families and many business partners. A programme of events had been organised that lasted throughout the day and gave the visitors an interesting insight into the scaffolding business. Branch manager Thorsten Schenk and his team had prepared numerous activities. They made the very most of the day to show how scaffolding work has changed over the last few years and become a business that requires high levels of skill.

Not only did XERVON's industrial climbers put on an impressive display of their work, they also demonstrated how operatives can be rescued high up on a scaffold should they get into difficulty – a truly spectacular sight. A large stand had also been set up dedicated to the whole subject of safety. This showed, for example, what tools and safety equipment scaffolders need to wear and carry with them nowadays. A dummy wearing all the gear including personal protective equipment (protective clothing, protective mask, gas detector etc) illustrated this perfectly and many of the visitors were astounded by just how extensive a scaffolder's kit actually is.

On another section of the grounds, a scaffold was continuously being erected and taken down throughout the day to give all the guests, who had little experience of the industry, the opportunity to see how this work is performed close up. Setting up the base, adjusting the height, levelling the surface, aligning the system, erecting the first scaffolding level, building the rest of the scaffold and then taking it down again ... alternating teams of scaffolders demonstrated how each individual stage was carried out – with all of them wearing a full set of PPE (personal protective equipment), of course.

There was also a particularly interesting display of scaffolding material that took a look back at how the equipment has changed over the decades: a whole range of materials were on show – from the wooden scaffolding poles with 'VEB Gerüstbau' inscribed on them all the way through to the systems being used at the moment – with all of them being, of course, "state-of-the-art" when they were in use. "This display clearly demonstrated just how much this business has changed in such a relatively short period of time and how much skill and know-how are needed," Thorsten Schenk continued. As was demonstrated by a cube of scaffolding made up of scaffolding tubes and couplers. This structure was around three metres by three metres and had been made by two XERVON scaffold labourers as part of their further training course to become scaffolding specialists.

Modern scaffolding apprenticeships have moved far beyond the old-fashioned image of a scaffolder. According to one of the company's trainers, a scaffolder needs both "brawn and brains" nowadays. Since the craft of scaffolding officially became an apprenticeship profession in 1991 and a professional trade with a master's certificate in 1998, the job of scaffolder has become an attractive career choice with good job prospects. XERVON offers scaffolding apprenticeship jobs at its different locations to give young people the opportunity to qualify in this profession. Should you be interested in such an apprenticeship, then simply send your application to Mr Soenke Friedrich at soenke.friedrich@remondis.de

One of the highlights of the event can still be viewed today: the team had put together scaffolding to create the word XERVON and painted it red and white to match the company colours. This impressive structure (seven metres long and two metres high) has been placed next to the entrance of the new building, making it very clear which company is working inside.

Keeping the “Bermuda Triangle” safe

CORROSION PROTECTION WORK AT MOVIE PARK GERMANY

Once a year, XERVON's surface technology experts travel to the German town of Bottrop-Kirchhellen to carry out one of their more unusual tasks: with all the rides at Movie Park Germany needing to be prepared for their annual TÜV inspection at the beginning of the winter season, the corrosion specialists are called in to service the rides' steel supports and remove any corrosion that may have appeared over the previous twelve months.



“The environment is a bit more colourful than usual but the job we have to do is the same as anywhere else,” was the general opinion of the XERVON team responsible for the project at the Movie Park. Last year, the “Bermuda Triangle” water ride was at the top of the list of attractions needing to be serviced. Hardly a surprise really considering that the ride’s steel supports are permanently exposed to high humidity levels, making them more vulnerable to corrosion. A very careful eye is, therefore, kept on the steel beams and maintenance work is carried out as soon as any rust appears. This is essential work as they have to be able to support the weight of the tracks, the cars and the water. It doesn’t bear thinking about what might happen if a corroded steel beam failed: parts of the track that rise steeply through the inside of the volcano in the dark and surrounded by fog could then collapse.

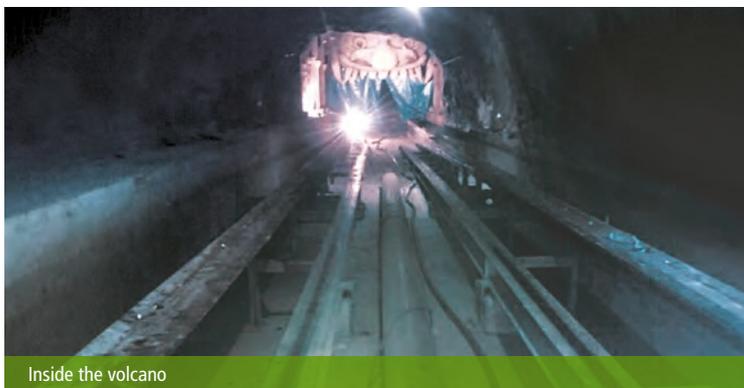
The surface technology experts from XERVON Oberflächentechnik carried out extensive maintenance work on two areas of the ride: the sides of the track in the “splash” section and three horizontal steel girders in the “exit lift” section. As the name “splash” suggests, up to 800 guests an hour end up getting pretty wet when they travel through this part. The final highlight of this really fast ride is when the car shoots out of the volcano and ends up in a pool filled with water. The first thing that had to be done before work could begin was to completely empty this pool. As soon as the water had been removed, the XERVON specialists carried out blasting work on the surface of both sides of the 15-metre track to determine the exact extent of the damage caused by corrosion. After the operator had completed some welding work in close consultation with the TÜV inspection agency, XERVON then blasted the surface again to ensure it was not only clean but also had the right degree of roughness. This is vital as the anti-corrosion coating can only provide long-lasting protection if the surface has been prepared properly.

 **800**

As the name “splash” suggests, up to 800 guests an hour end up getting pretty wet when they travel through this part



The corroded steel girders before they had been treated



Inside the volcano



Blasting work being carried out on the side of the track

Each coating manufacturer stipulates how and under what conditions their material should be used. XERVON’s corrosion protection experts not only have this specialist knowledge but also the know-how to analyse the environmental conditions and so determine which coating system will deliver the best results. Here in Movie Park Germany, for example, they chose a special damp-resistant coating that was applied in several layers.

The same method was then carried out on the three steel girders in the “exit lift” section – although an additional step was needed here: the horizontal steel beams had been so badly damaged as a result of being permanently exposed to water, that the operatives had to first remove the corroded steel by hand using hammers and chisels before the blasting work could begin. This was no problem for them at all, though, as such projects are always prepared meticulously beforehand so that they can deal with all eventualities and complete the task in hand efficiently and according to schedule.

The guests expect the rides to be safe – this is always the case here thanks to XERVON

The ECG for your plant

CONDITION-BASED MAINTENANCE WORK GOES DIGITAL



The system's
evaluation modules

For years now, XERVON Instandhaltung, the Group's maintenance specialists, have been offering condition monitoring as part of their future-oriented maintenance strategy. By using a variety of monitoring methods (such as vibration analyses or the measurement of structure-borne noise), the XERVON experts are able to identify individual machine parts that are broken or suffering from wear and tear. This early warning system helps prevent unexpected plant outages and keeps costs down – two extremely important factors for the customers. The maintenance experts have now gone a step further: by integrating the recorded measurements into a company's digital network, customers now have access to a range of features enabling them to use this data intelligently and productively.

Using XERVON Instandhaltung's condition monitoring reduces the chances of an unexpected production outage to an absolute minimum

Professional industrial service providers, such as XERVON Instandhaltung GmbH, are able to offer their customers a wide portfolio of services – and condition monitoring is always one of their core areas of expertise. Assessing a plant's condition by carrying out targeted measurements and then analysing the recorded data is an extremely helpful and sustainable way to minimise plant downtime and increase a facility's operational life.

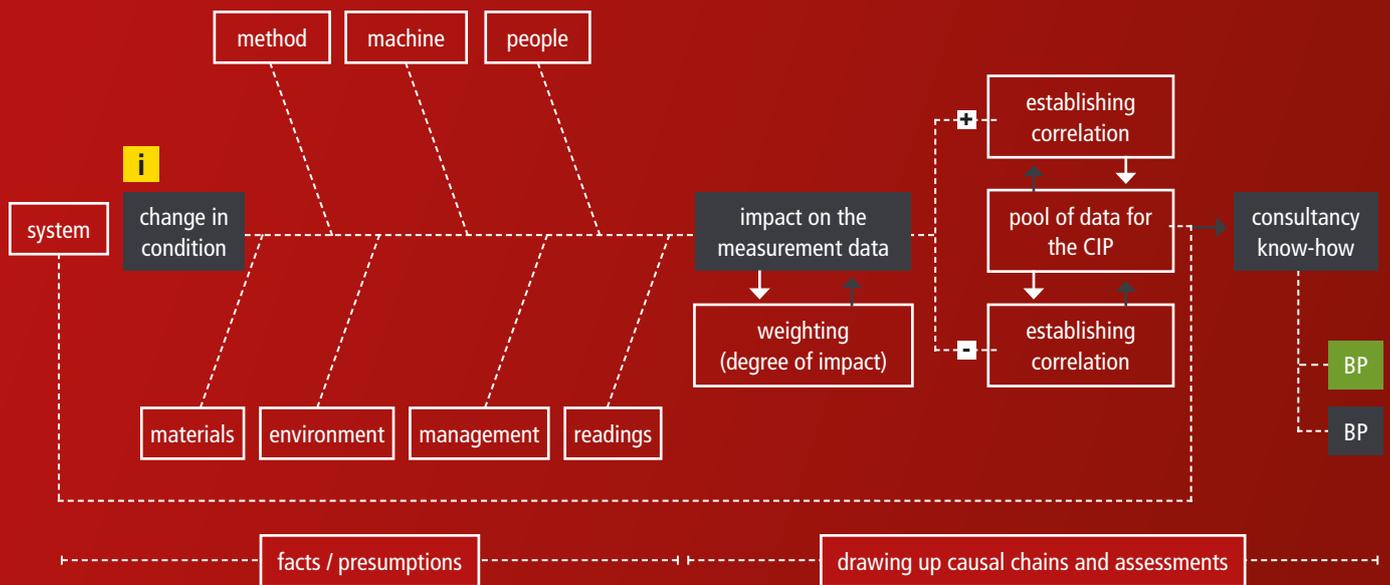
A vibration transducer is used when carrying out vibration analyses so that the sound on the surface of the machine – created by the alternating forces in the machine – can be measured. This data is then depicted as a graph and assessed. Should there be an irregularity, the XERVON maintenance specialists can determine the precise condition of the piece of equipment in question and pinpoint exactly where the fault is so that their customer can plan their repair work in good time. Some machine parts (such as bearings, gear wheels, shafts and belt drives) are monitored all the time so that their

condition can be continuously documented. This makes it possible to track down the parts affected by wear and tear before they cause the machine to fail. The chances of an unexpected production outage are reduced to an absolute minimum. What's more, the individual parts can be used for as long as possible as their condition is being permanently monitored and they can then be replaced as and when necessary during a planned shutdown period.

The advantages of this method are plain to see:

- Unplanned, costly and avoidable plant outages are reduced to an absolute minimum
- Spare parts management is improved (fewer items need to be stocked)
- Staff deployment is improved
- Less time is needed to detect faults
- Operational and staff safety is increased
- Production planning is improved

A cause and effect diagram as a CIP tool



BP positive best practice BP negative best practice

However, it is only possible to analyse and interpret this data correctly if you have the right know-how. Which is why XERVON Instandhaltung only deploys highly qualified professionals who have years of experience of dealing with such diagnostic systems. "It's certainly not enough to say to our customer that the machine is vibrating a bit more than usual and something bad might happen soon!" explained Steven Brenner from XERVON's condition monitoring division. "We need to be able to evaluate our readings to pinpoint exactly where a potential source of trouble is so that, for example, the whole gearbox doesn't need to be replaced but just the second stage gear. Thanks to our know-how, we are not only able to determine the exact condition of specific types of machines and the relevant critical limit values but also to give warnings of possible failure." The wealth of experience needed to define such limit values and analyse damage progression has been gathered from across the whole of the XERVON network. The engineers have access to a directory containing the measurements and comparative data recorded from monitoring over 8,000 machines. As a result, the pertinent data gathered by XERVON as part of their condition monitoring work can be used as the basis to continuously improve processes at their customers' businesses (see illustration above).

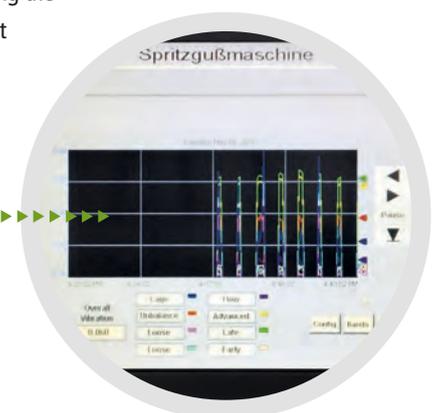
Industry 4.0

Predictive maintenance work has taken yet another step towards the future with the development of digital online systems. A specially adapted online system, which XERVON is currently setting up at a large German automobile supplier, illustrates perfectly just what is possible when digital support is available. The system has been designed so that it is not only possible to record the data but also to enable it to be transmitted, forwarded, stored and processed in a variety of ways. If alterations need to be made to the system (e.g. changing the section that needs measuring), then this can be done via remote access – a solution that is quick and can be carried out no matter where the person may be.

One of the main goals of this system is for the maintenance-specific data to be effectively integrated into the customer's other systems (such as maintenance planning and control systems (IPS)), i.e. to filter and only pass on information that is truly relevant to their maintenance programme. The greatest challenge here lies in interpreting the recorded data as well as further processing it and making it available for the higher level planning systems.

Intelligently integrating maintenance data into a customer's planning and control systems is one of the challenges for the future and will help grow effectiveness

The system's recorded data



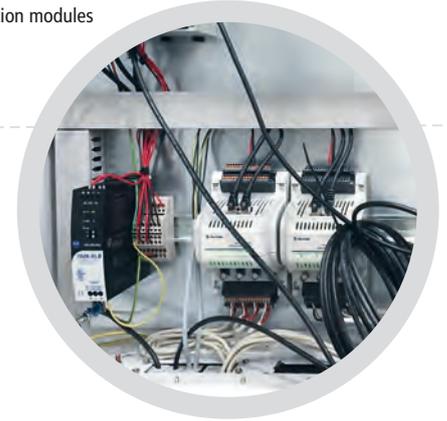


The online system's panel on the CM box; the data from the individual sensors can be viewed here

- ▶ A further example – in this case in the plastics-processing industry – demonstrates just how cleverly XERVON's maintenance experts are able to dovetail modern information and communications technology and production processes to perform an in-depth analysis of a plant's condition. The XERVON engineers have installed a system in a production plant to monitor an electric engine, its bearings and four pumps with roller bearings. The challenge: meaningful data can only be recorded in the ten-second gap between two production cycles. Their smart solution: thanks to the online system, it is possible to enter very precise settings determining exactly when the measurements should be taken. The XERVON engineers have even programmed the online monitoring system so that the process plant itself sends out the signal when there is a gap between cycles and again when the measurements have been taken.

Whether it be in-depth analyses or customer-specific visualisation interfaces: XERVON Instandhaltung is working hard on creating new ways to make condition monitoring even more productive for their customers

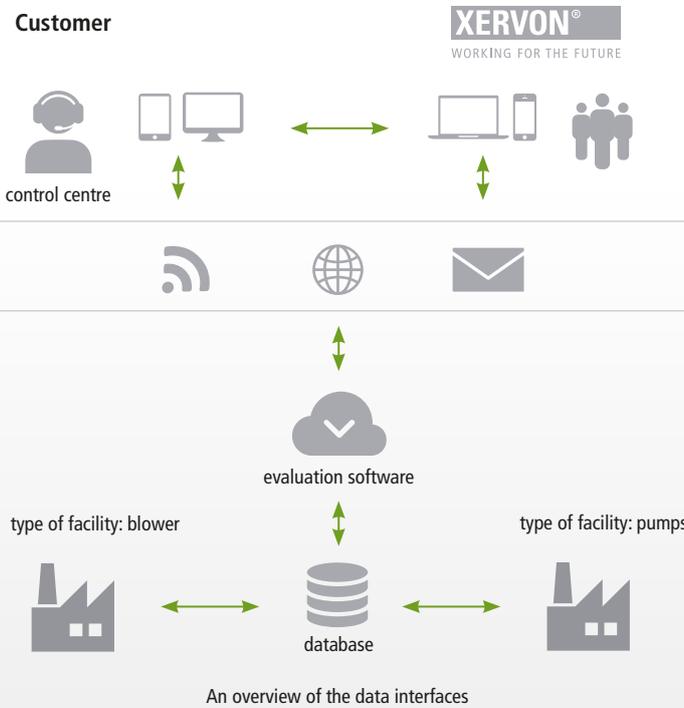
The system's evaluation modules



Advantages of online systems

The different ways the data can be used, once it has been entered into an online system, are pretty much boundless. Steven Brenner believes there are a host of opportunities just waiting to be used here. He and his colleagues are working hard on creating new ways to enable condition monitoring to be even more productive for their customers – starting with an extensive range of in-depth analyses all the way through to customer-specific visualisation interfaces. Depending on their clients' particular requirements, they can compile hourly, daily and weekly reports and the data can be trended for the individual parts being monitored. What's more, it is possible to determine when value limits are occasionally exceeded so that measures can be introduced to solve this problem long term. A further option is to program the system so that a plant automatically shuts down if a certain value limit is exceeded. "Our customers tell us exactly what they want and we set it up," Steven Brenner continued.

One particularly useful feature of this system is that it enables the data from all plants to be evaluated centrally and for best practices to be implemented across all similar facilities. One example: a manufacturer based in Germany uses condition monitoring systems to monitor its various process plants around the world. All of the information and data recorded are sent online to a single database and then analysed centrally using the relevant evaluation software. The results of this analysis can then be used to send feedback, recommendations and improvement measures – via the digital network of course – back to the individual plants.



By implementing targeted condition monitoring measures, the experts are able to analyse a plant's condition in detail so that targeted and cost-saving maintenance work can be carried out and plant availability improved

Cleaning specialists with good sea legs

INDUSTRIAL CLEANING WORK ON THE HIGH SEAS

Offshore work has its very own set of rules and challenges – and this is something the team at HEINZ PULS GmbH & Co are well aware of. This Brunsbüttel-based company, a BUCHEN subsidiary, has gradually been making a name for itself as a specialist for industrial cleaning work on the open seas. It has, for example, recently signed a service agreement which will see it cleaning the vessels and pipes on Mittelplate in the North Sea, Germany's only offshore oil rig, over the next few years.

No matter whether it involves an offshore wind farm or an oil rig, industrial cleaning work is also needed on the high seas. Every wind farm, for example, has a transformer platform which is also home to a number of storage tanks containing waste water, diesel or heating oil for the various units. These, for example, provide fuel when there is no wind so that the wind farm's infrastructure (computers, light etc) has an unbroken supply of electricity. The waste water tanks must be emptied and cleaned as soon as they are full; the diesel tanks have to be inspected every five years and so must be empty and clean for the inspectors. "Cleaning such offshore tanks is one of our specialties," said Martin Stellmacher, head of the technology division at HEINZ PULS. They are also present during the actual inspection itself so that they can provide the external inspectors with the technical equipment they need (safety harnesses, climbing equipment etc).

"The real challenge to any project being carried out at sea is the meticulous preparation work that has to be done beforehand and that must take the many health and safety regulations into account. This involves a huge amount of time spent on planning and logistics," Martin Stellmacher continued summing up the special requirements of offshore work. The actual cleaning work itself is routine: any residual material is first pumped into special containers or straight into the storage tanks on the ship docked alongside the platform; the operatives – who have all taken part in special offshore work training courses – then climb into the tanks wearing their personal protective equipment. The tanks, which rarely have a capacity greater than 25 cubic metres, are washed using a suitable biologically degradable cleaning agent. The used water is also pumped onto the waiting ship so that it can be recycled on the mainland. ▶

"The real challenge to any project being carried out at sea is the meticulous preparation work that has to be done beforehand and that must take the many health and safety regulations into account."

Martin Stellmacher, Head of Technology at HEINZ PULS



- ▶ All individual steps have to be planned and organised in detail if the work is to be completed without a hitch. All decisions are based on the in-depth risk assessments and risk analyses that are drawn up together with safety experts and take all local conditions into account. This is, Martin Stellmacher believes, the key to their success: "We consult with our clients right from the very beginning so that we can draw up a suitable safety concept and a detailed work schedule. This close personal contact helps to convey just how important the subject of safety is at our company – and conveys it much better than any certificate can."

Keeping people and the environment safe

Top priority is always given to achieving the highest possible levels of work safety and environmental protection. This is another reason why so much time is spent on planning and logistics: starting with organising the transport (helicopters for the employees, a ship for the technical equipment and other supplies as well as for storing the used liquids) all the way through to organising the staff and material needed.

A detailed list must be drawn up in advance to specify exactly what tools, machines and personal protective equipment will be required. Each individual piece must be tested just before they are needed to check they are fit for purpose and then packed in seaworthy transport containers. "The whole project can end up failing if just one piece of equipment is missing or if just one tool is broken. When you are out there surrounded by water, you can't just go around the corner to find a spare one," Martin Stellmacher continued, giving a simple but perfectly logical explanation.

In contrast to the rigid rules determining this time-consuming preparation phase, the operatives performing the actual work must be flexible and able to carry out their tasks at short notice. All offshore work is dependent on the weather, the state of the sea and the tides. The final local weather forecast, therefore, determines whether it's all systems go or not. It is not unheard of that a project has to be cancelled or postponed just a few hours before it was due to start. Martin Stellmacher commented: "We're prepared for this. We only need a few hours to pack everything together and get to the harbour in Emden."

"Go"

All offshore work is dependent on the weather. The local weather forecast, therefore, determines whether it's all systems go or not





HEINZ PULS GmbH & Co., which is based in the German town of Brunsbüttel, is a fully owned subsidiary of BUCHEN UmweltService GmbH. Employing around 50 people, the company primarily specialises in cleaning, servicing, dismantling and recycling all types and sizes of tank. Its extensive portfolio of services, however, also includes cleaning cooling equipment, boilers and heat exchangers as well as cleaning and servicing light liquid separators. HEINZ PULS GmbH & Co. is a member of the Bundesverband Behälterschutz e. V. und der Gütegemeinschaft Tankschutz und Tanktechnik e. V. [a federal association focusing on container protection, tank protection and tank technology]. Moreover, the company has been awarded unconditional SCC** accreditation.

For the most part, the cleaning work is carried out using hot water equipment – specially produced according to HEINZ PULS’ specifications – and special transportable pumps. These small, offshore-compliant units are packed into a mesh box so they can be lifted by crane from the ship onto the platform. “We can’t take the large high-pressure pumps that we normally use on onshore building sites. Our special vacuum/cleaning trucks aren’t used either until the ship has returned to Emden. They’re brought in to remove the used washing water and clean the ship’s tanks.”

A network of know-how

Being part of the REMONDIS Group, HEINZ PULS now has access to some new and highly interesting business opportunities: thanks to its parent company, BUCHEN, it has been able to take part in major projects allowing it to make the very most of its workforce and equipment. At the same time, its contact to RHENUS Offshore Logistics has also created new openings. As its name suggests, this logistics specialist, which – like REMONDIS – also belongs to the Rethmann group, specialises in offshore work, taking over all supply and waste management tasks for offshore wind farm operators. The number of services it offers is growing all the time – including, for example, industrial cleaning work – so that its

customers can benefit from having everything delivered by just one company. Working on behalf of RHENUS, therefore, the HEINZ PULS experts have already handled diverse diesel tank inspections and cleaned waste water tanks at offshore wind farms.

One of the company’s latest successes has been the conclusion of a service agreement with DEA Deutsche Erdöl AG: HEINZ PULS is now responsible for cleaning all the pipes and storage containers on Mittelplate, Germany’s only oil rig. The rig, which is just 70 metres by 95 metres in size, is situated in the Wadden Sea nature reserve seven kilometres off the west coast of the German state of Schleswig-Holstein. Up to 1.6 million tonnes of crude oil are extracted from this oil field every year and transported to the mainland via an underground pipeline. The rig’s operator, DEA, is very proud of its responsible operations and long-standing safety record. Which is why it takes a very close look at all the external contractors working on its platform to make sure they comply with their very high standards. With this in mind, Hans-reiner Richter, managing director of HEINZ PULS, believes that the service agreement is “further confirmation of the high quality of our work”

Highly flexible: HEINZ PULS needs just a few hours to get ready after it has been given the go-ahead



1.6 million tonnes

1.6 million tonnes of crude oil are extracted from the oil field off the west coast of Schleswig-Holstein every year

The material is safely conveyed upwards through the pipe instead of having to be lifted up by crane

New filling system means fewer cranes

BUCHEN-ICS' MATERIAL-FRIENDLY CONVEYING SYSTEM CAN BE USED IN ALL TYPES OF WEATHER

BUCHEN-ICS has further developed an innovative filling system to enable reactors and vessels to be filled with catalyst or other bulk materials without the need for a crane – no matter how strong the wind or how bad the weather. A unique solution that will make it much easier for businesses to plan ahead.

In most cases, a crane has to be brought in to help out when reactors and vessels need to be filled with bulk material as it can lift up the material (packed, for example, in big bags) and place it next to the opening. However, regulations stipulate that a large area must be cordoned off around the lifting area (suspended loads) to keep everyone safe – and work must be stopped if it rains too heavily or if there are strong winds. This is where BUCHEN's dense phase conveying system (DPC) comes into play. This upgraded material-friendly system enables reactors and vessels to be filled without interruption in places where a crane may not be used for safety or weather reasons.

And this is how it works: the dense phase conveyor consists of two storage tanks that are firmly fixed in a frame on the ground and completely weatherproof. The material is conveyed pneumatically from the first tank into a stainless steel pipe. The material can be conveyed vertically up to 90 metres above ground – no matter what the size, shape or weight of the granules may be. At the same time, the second tank is filled with material. This enables the filling process to be completed uninterrupted and ensures that the whole of the pipeline is filled throughout. Once the material reaches the top of the vessel/reactor, it is automatically transferred into a filling container – also protected against the weather – before the actual filling of the reactor begins. This makes it possible for a variety of filling techniques to be deployed such as sock loading or dense loading. An additional hose line links the filling container with a vacuum unit below so that any dust particles generated by the filling process can be vacuumed off.

By using hose lines and a filling container next to the opening of the reactor/vessel, the BUCHEN-ICS specialists ensure that the material is conveyed safely and remains dry throughout





The dense phase conveying system is suitable for all types of reactors and vessels

Any place, any time

The dense phase conveying system is suitable for all types of reactors and vessels. As it can be stored in a 20' container, it can be transported to and installed wherever it is needed in no time at all. Whether it is raining, stormy or there is simply a lack of space: BUCHEN's new filling system can be used to fill reactors in CCR, HC, Claus and styrene plants as well as molecular sieve vessels, HDS reactors, vessels in ethylene/propylene hydrogenation plants as well as narrow PSA plants.

Tests show excellent results

This innovative system first underwent an extensive test phase that lasted several months to check it worked smoothly. This was carried out on BUCHEN's own premises in Cologne where it had a 30-metre-high scaffolding tower built specifically for this purpose. The developers tested the system under a variety of different conditions. After all the tests had been passed with flying colours, the company then put on a special event in the autumn of 2016 to present the technology to its customers. Since then, it has been deployed in various projects and proven to be an absolute success each and every time.



Everything under control: the system first underwent extensive tests; a 30-metre-high scaffold was built to simulate the exact conditions

BUCHEN LIGHTS up the dark

INNOVATIONS MAKE BOILER WORK SAFER

In their ongoing efforts to improve work safety, BUCHEN KraftwerkService GmbH recently launched a number of product innovations onto the market that will – above all – make boiler work considerably safer. RWE has already commended the company for “further developing health and safety”.

With the level of brightness increasing by almost 59 percent and the bulbs lasting up to 90 days, work efficiency levels are higher and costs considerably lower

The risk of a work accident is considerably higher when blast cleaning work has to be carried out in storage vessels or narrow spaces: hose lines, fixtures, ropes and cables are all potential tripping hazards, insufficient lighting or sudden blackouts, extreme climatic conditions, noise ... the list of hazards is long. Which is why the rules drawn up by the DGUV [German Social Accident Insurance] explicitly stipulate that an additional person must be present and must be in constant contact with the operatives working in the vessel, silo or narrow space so that they can help or call for help in the case of an emergency.

Up to now, however, it has proven to be extremely difficult – or even practically impossible – to find a radio communications system that works well enough for operatives to remain in constant contact with the person outside whilst carrying

out blast cleaning work in vessels or narrow spaces. The operative and boiler operator generally communicate using Morse code via the so-called “dead man’s switch”.

The solutions currently available on the market are suitable for stationary cubicles used to blast clean equipment and, to a certain extent, for blast cleaning work carried out in the open. Things become a lot more difficult, however, when the work needs to be done inside a boiler, e.g. on the refractory concrete. Boilers act like a Faraday cage so the signal must be extremely strong to penetrate the walls. What’s more, the incredibly high noise levels generated by blasting work (in some cases more than 120dB) mean that the operatives need really efficient ear protectors. At the same time, the communication system’s two-way headset must also work perfectly.

Born out of necessity: the dead man’s switch seen here – designed as a piece of safety equipment – is often also used to communicate with those outside



120dB

The incredibly high noise levels generated by blasting work (in some cases more than 120dB) mean that the operatives need really efficient ear protectors



Another BUCHEN innovation: the extremely robust handheld LED lamp

BUCHEN's very own innovation

Having carried out both extensive product research work and product trials, BUCHEN's specialists have succeeded in developing their own set of patent-protected equipment that meets absolutely all these requirements: a combination of a high-performance radio device, PPE-compatible switches, blasting helmets with an integrated headset and a special protective pouch. This system means that rapid radio contact can be set up between those in and outside the boiler (via a frequency agreed on with the 'BNetzA' [Federal Network Agency]) even when the levels of noise are extremely high. RWE has already officially commended the company on developing this innovative radio communications concept. BUCHEN's engineers are currently looking into where else this innovative system could be used.

There is also huge potential for another BUCHEN innovation, which is already protected as a utility model and is currently undergoing tests to receive CE accreditation: a handheld, LED-operated boiler lamp. Special lamps that are used as safety equipment or for emergency lighting and that have not been designed for general lighting use are exempt from the ban on incandescent and halogen light bulbs. Such lamps include, for example, handheld industrial lamps such as those used when working on boilers. Despite this exemption, however, the BUCHEN engineers believed there was still room for improvement as the bulbs often have to be changed as they are neither impact nor shock-proof. This costs both time and money and – above all – creates dangerous situations if the light suddenly goes out and the person in the boiler finds themselves in the dark.

Thanks to the engineers developing an industrial LED handheld lamp, the lifespan of the bulb is much longer than that of conventional bulbs. Long-term tests have shown that the lifespan has been increased from an average 20 hours to up to 90 days. What's more they are also much brighter, increasing the amount of light from an average 870 lumen to an average 1,350 lumen – a rise of almost 59 percent. To sum up: the new LED handheld lamps clearly increase work efficiency levels and cut costs. Two good reasons why BUCHEN is already working on other types of lamps for use in a whole range of other areas.

1st place

for BUCHEN UmweltService

EVONIK's Lülldorf branch has presented BUCHEN UmweltService GmbH with its 2016 Partner Award in recognition of its excellent safety standards. 1st place was given to the company's team of employees who had demonstrated exemplary levels of workplace safety whilst carrying out their day-to-day work. The Partner Award trophy and certificate were handed over to BUCHEN's very proud team during a special ceremony held at the beginning of the year.

A number of EVONIK employees (work safety and plant security staff, plant and departmental managers, day shift foremen and contractor coordinators) had observed and evaluated the work performed by the partner firms at the site over a twelve-month period. BUCHEN is responsible for the complex high pressure industrial jet cleaning work needed at the Lülldorf plant (e.g. for their storage vessels, heat exchangers, pipes etc) as well as for the cleaning and CCTV inspection of the plant's wastewater network.



Lightweight scaffolding high up in the air

XERVON AUSTRIA ERECTS A VERY SPECIAL KIND OF
SCAFFOLDING AROUND THE VOTIVE CHURCH IN VIENNA



XERVON Austria's scaffolding experts came to the rescue recently drawing up a bespoke solution to erect a scaffold around one of the turrets of the Votive Church in Vienna – saving the church authorities a large sum of money and, once again, demonstrating their outstanding technical expertise.

Over the last twenty years, the scaffolding specialists working at XERVON Austria have often been called on to erect scaffolds around different sections of the Votive Church. Their client, the St. Josef's Foundation of the Archdiocese of Vienna (responsible for historic religious buildings), is one of the company's key customers. Consecrated in 1879 following 23 years of building work, there is always some part of the church that needs renovating. The Votive Church is considered to be one of the world's most important neo-Gothic religious buildings. The decision had been made to build this church as a votive in gratitude for the sparing of Emperor Franz Joseph 1 after he survived a failed assassination attempt on 18 February 1853.



Consecrated in 1879 after 23 years of building work, the Votive Church is one of the world's most important neo-Gothic religious buildings

An extensive list of restoration work has been planned for the church's façade, roof, roof truss and windows. Work is currently being carried out on the so-called ridge turret – a 20-metre octagonal tower built 42 metres above the ground on the ridge of the roof at the point where the nave and transepts meet. With a diameter of 4.5 metres at its base, this very pointed turret rapidly becomes much narrower as it rises upwards. It is made of a steel skeleton frame covered in metal sheets. A number of different experts – tinsmiths, metal workers and metal restoration specialists – are now in the process of restoring this structure from their safe work platform on the scaffolding erected high up in the air.

Engineer Harald Sauerwein, XERVON Austria's site manager responsible for work platforms and scaffolding, believed that the biggest challenge of this particular project was designing and planning a cost-effective base which the scaffolding could rest on: "There were a number of difficulties to be overcome here. On the one hand, the slate roofs surrounding the turret had themselves just been restored and so it was essential that they were not affected by the scaffolding in



Experts at work: the scaffolding experts designed and erected a safe platform so that the restoration specialists can carry out their work



any way. Having said that, they are all so steep that they couldn't have provided a stable base anyway." The Archdiocese's planning office had been resigned to the fact that they were going to have to pay for a steel base structure to be built – something that would not only have been very time consuming to set up but also very expensive.

Within no time at all however, XERVON's specialists had come up with an alternative that was considerably less expensive: working closely with the structural engineers at the planning office, they developed a concept that involved scaffold lattice beams being placed through the turret openings. These were used as the base for the scaffold, which was then erected around the tower and consists almost exclusively of lightweight aluminium material. The scaffold structure has been designed to bear a weight of 2 kN/m² – more was not possible as this was the maximum load that the church's roof truss could bear.

Logistics also played a vital role in this restoration project as the church is situated right in the centre of the city. "It was clear from the start that we would need to have a mobile crane on site whilst the scaffolding was being erected, so that the scaffolding material could gradually be passed up as it was needed. The ridge turret's exposed position and

the lack of storage space on the scaffolding meant we had no other choice," said Harald Sauerwein explaining the relatively time-consuming option used to get the material to the roof. The scaffolding material will soon have to be removed in exactly the same way as the restoration work is expected to have been completed within just three months. And then yet another successful step will have been taken to preserve the Votive Church. A successful but small step as the Archdiocese's planning office is expecting the restoration work on the outside of the church to take around 20 years and cost 32 million euros. There are, therefore, bound to be a number of other opportunities in the future for the XERVON scaffolding experts to demonstrate their expertise.

The special features of this project: an ingenious structure and smart logistics



Beautiful homes in Nacka Strand, Stockholm

SCAFFOLDING SPECIALISTS XERVON HELP TO BUILD TOP QUALITY FLATS JUST A STONE'S THROW FROM THE CITY CENTRE

This is seaside living at its best: a number of exclusive flats are currently being built in Nacka Strand – right on the water's edge and with a spectacular view of the marina and the city. REMONDIS' subsidiary, XERVON, is responsible for the complex task of erecting the scaffolding and providing protection against the weather for this major building project.



Built in the 90s and situated on the Baltic Sea entrance to Stockholm, the office building is currently being transformed into exclusive flats



XERVON's scaffolding division is well known for always being able to deliver the number of personnel and volumes of material needed

Stockholm is considered to be among the prettiest of the world's cities. Commonly known as the Venice of the North, the Swedish capital offers an attractive mixture of urban life and unspoiled nature that is not only attracting an ever growing number of people wishing to visit the city but also wishing to live there. This gradual increase in the city's population has meant that there is also a growing demand for new homes. One of the solutions has been to strengthen the links between the city centre and its immediate surroundings by improving ferry services, bus routes and the underground network. One example is the Municipality of

Nacka, which lies just outside the city of Stockholm and effectively connects the capital to the 30,000 islands and islets – known as skerries – in the Baltic Sea.

268 new flats are currently being built in Nacka Strand, all of which will have a modern layout, contemporary furnishings and a view of Stockholm. An old office building, with a total floor space of around 44,500 square metres, is gradually being transformed into attractive residential homes. Work is to be carried out on the outside of the building throughout – with new windows needing to be installed, balconies built and a twelfth floor added for the penthouse flats. This major project, which began in 2016 and is due to last until 2019, was initiated by Skanska Sverige, one of Sweden's leading property developers, together with the US private equity firm, Carlyle. All in all, the partners are expecting to invest 123 million euros in this venture.

All in all, this project required

15,000m² scaffolding material and **8,000m²** weather protection

XERVON Sweden AB

XERVON Sweden AB is one of the leading scaffolding businesses in Sweden. Based in Stockholm-Kungsängen, it has branches in Gothenburg, Karlstad, Norrköping and Örebro. It primarily serves customers operating in the fields of infrastructure, construction, chemicals and petrochemicals as well as the energy sector.

xervon.se

Complex scaffolding requirements

The building's outstanding location – right next to the Baltic Sea and the marina – will certainly add greatly to its appeal and make it a very desirable place to live. It is, however, making some construction work more difficult. This is especially true for the scaffolding work which is the responsibility of XERVON Sweden AB. XERVON project manager Jacob Holm explained: "The sheer size of the project, the height of the building and its location next to the water have all created a whole number of technical challenges. It is, for example, very much exposed to the elements which means we have to take all of the forces caused by wind and weather into account." This is particularly true for the gigantic structure that has been erected almost 35 metres above the ground to protect the building against the weather. This protection was essential: it would have been impossible to add the new penthouse floor without it.

Organising the logistics also proved to be a challenge, as the construction site is right in the centre of a residential area. In order to make sure their work impacted as little as possible on normal city life, XERVON decided to deliver the 15,000m² of scaffolding material and the 8,000m² of weather protection in the early hours of the morning where cranes were then used to hoist them into position.

Partners from the very start

Planning work on the project began more than twelve months before the actual building work started and XERVON has been involved from the very first moment. The company has arranged for between 12 and 16 experienced operatives to be on site throughout the whole of the construction phase. Jacob Holm continued: "We have succeeded in finding the best and most effective solution no matter how complicated the task. This can be put down to our know-how and experience and, of course, to the successful way our two firms have worked together." The first families will be able to move into their new flats in the summer of 2018 – in this idyllic setting right next to the skerries and yet still so close to the vibrant city of Stockholm.

Experts for specialist solutions: the building's exposed location meant complex calculations and a special design were needed to make it structurally safe

The old office complex is being turned into 268 new flats, each with a balcony, large windows and a spectacular view of the water



Think big!

LOGISTICAL AND CONSTRUCTION CHALLENGES MASTERED FOR A MAJOR TANK CLEANING PROJECT AT THE OTHER END OF THE WORLD

Many companies appreciate the quality of services that are "engineered in Germany" – whether they are here in Europe or at the other end of the world. Just one example is BUCHEN's Russian subsidiary, BUCHEN Industrial Services OOO, which is based in Ufa and has an excellent reputation for carrying out professional tank cleaning work, especially on large tanks. The company is well known for its reliable services, which are always delivered in line with the most stringent health, safety and environmental standards, no matter how complex the circumstances.

Diameter



100 m

Capacity



112,000 m³



Big dimensions: not only the size of the tanks but the distances between the projects as well



Different countries, different challenges: long distances to get to the customer, rough terrains, extreme weather conditions ... The challenges faced by companies offering tank cleaning services to Russian refineries and oil terminals are completely different to those their counterparts must deal with here in Western Europe. No matter where in the world it may be, however, BUCHEN always cleans tanks using closed and automated systems which it has developed and adapted itself to ensure they are fit for purpose. Which is why these systems are also deployed in Russia to deliver safe and environmentally compatible tank cleaning services and recover high volumes of crude oil for re-use.

Different conditions, identical standards

In March 2017, BUCHEN travelled to De-Kastri – a Russian town situated almost 11,500 kilometres from Cologne – to clean an 18m high storage tank (diameter: 95 metres, nominal capacity: 112,000 cubic metres). De-Kastri, a coastal town on the Sea of Japan, is located in the Khabarovsk region in the Russian Far East and home to an export terminal belonging to 'Sakhalin-1', one of the country's largest oil and gas production projects. All of the oil produced there is handled by this terminal. With the two large tanks having been in use there since 2005, it was now time for the first of them to be emptied, cleared of 3,000 cubic metres of sludge and cleaned so inspection and welding work could be carried out – with project operator Exxon Neftegas Ltd's strict safety standards being adhered to from start to finish.

Projects involving climatic conditions similar to those in the Arctic and a location that even Russians would call remote need to be planned meticulously in advance – and this is precisely what BUCHEN's specialists did together with their German colleagues to ensure that the cleaning work in De-Kastri went smoothly. Managing Director, Ljudmila Ochotnikova, commented: "Both our processes, methods and know-how and our employees' specialist qualifications and training are just as important here in Russia as they are elsewhere in Europe. The supply network here, however, is totally different. This is a huge country and if a piece of machinery breaks down you can't simply go around the next corner to find the spare part you need or get more staff. All possible contingencies must be planned for in advance." Which is exactly what they did here in De-Kastri, too, taking along a spare unit for every piece of equipment they intended to use.

The oil tank itself was cleaned using a closed and automated system. This tank-cleaning process is not only the safest way for operatives to carry out their work, it is also the most environmentally friendly. What's more, it is able to recover high levels of crude oil from the sludge. This method involves a number of different stages: firstly, the jet washer system was installed and the paraffinic deposits on the floor of the tank sprayed with heated crude oil until the floating roof settled on its supports. Following this, nitrogen was used to create an inert atmosphere so that the deposits could be flushed out – first with crude oil and then with water. The next stage was to remove the waste air and gas via the access manholes in the side of the tank. Finally, vacuum trucks were brought in to extract any remaining deposits from the floor of the tank before the whole of the tank interior was cleaned with hot, high pressure water. ►





A bird's eye view of
the giant tanks

- The cleaning specialists had to deploy a whole range of equipment to complete this work, all of which was loaded into sea containers in Ufa and then transported by truck to the terminal: everything needed for the project, which lasted several months, was delivered to the site – from jet washers (see illustration on p. 39), to nitrogen generators, high pressure pumps, water traps, compressors and heat exchangers, all the way through to a workshop for repairing the operatives' respirators.

A bespoke cutting unit, specially designed and built for this project, had also been transported to De-Kastri to enable the specialists to cut the liner tubes in the roof supports. The walls of these tubes were unusually thick (12 millimetres). Normally, the jet washer heads are slotted through these to get to the inside of the tank but this was not possible here as the tubes were too long for the lances. Working closely with the site's operator, the BUCHEN experts drew up a strict timetable to remove the roof supports and shorten the tubes. Everything went just as planned and all work was completed according to schedule.

In-depth know-how

A second team were also successfully cleaning another large tank in Atyrau, Kazakhstan, around the same time: here, though, the BUCHEN specialists were working on a 32,500 cubic metre crude oil tank with a domed roof. As was the case in De-Kastri, the tank (ca. 20m high and 48m wide) had to be emptied and cleaned so it could be inspected and overhauled. It was located in the Atyrau oil terminal, which stores and processes oil delivered by pipeline from the Karachaganak field 635 kilometres away.

Here, too, the tank was cleaned using a closed and automated system and crude oil to flush out the deposits. The main challenge that the company had to face in this particular project was the unusual dome-shaped floating roof as the BUCHEN experts had to develop a bespoke solution to enable them to install their cleaning equipment. The pressure pipelines, for example, had to be attached to the roof access ladder rather than along the tank's inner and outer walls, which would have been the standard procedure. "Drawing up tailor-made solutions is, of course, one of our specialties," explained project manager, Vadim Mansurov.

As in Germany, the operatives deployed for the project had to take part in special safety training courses and prove they were able to perform the work. Participating in seminars organised by the customer to learn about the on-site safety and emergency measures is a normal part of their work as is compiling project-specific method standards. This involves defining all individual work stages and all technology and equipment that will be needed for the project and then presenting these details to the client.

"Over the years, we have been able to demonstrate our professional approach and the high quality of our work in many different projects and locations and we are really pleased to be able to add De-Kastri and Atyrau to this list," concluded Ljudmila Ochotnikova.

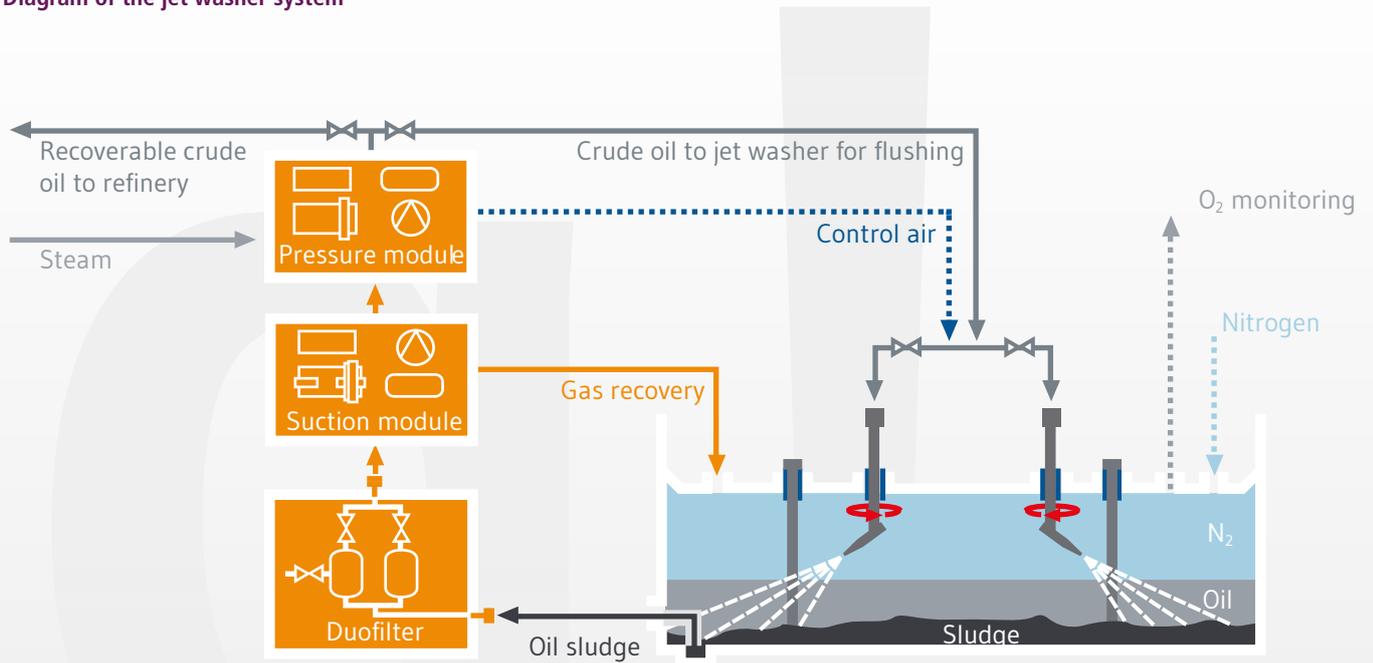
In Atyrau (Kazakhstan),
the BUCHEN specialists worked on a



32,500m³

crude oil tank with a domed roof

Diagram of the jet washer system



BUCHEN uses closed and automated systems to clean tanks, which it has refined itself to meet the particular requirements of the international market. Cleaning tanks by hand is particularly difficult work for the operatives and most of these complicated tasks can be avoided when automated systems are used. Customers benefit financially as high amounts of crude oil can be recovered from the sludge which, in turn, reduces the sludge disposal costs.

Jet washers are often used to clean large tanks. These are modular systems which can be installed in sea containers enabling them to be transported to wherever they are needed at short notice. The main components of this explosion-proof cleaning system are its mobile suction and pressure modules as well as its jet washers. To be able to clean the tank, a number of the tank roof supports are temporarily retracted so that the washers can be inserted through the liner tubes into the tank. The whole cleaning process is further facilitated by the special pipe system with its tried and tested, quick release stoppers and its high performance filters.

How it works

Once the system has been set up, the product is first removed from the tank using one of the suction modules and then run through a steam-powered heat exchanger where it is heated up to between 40°C and 60°C. The pressure module then pumps this warm product back into the tank via the jet washers so it can act as a cleaning media. With the nozzles rotating in three dimensions, the product enters the tank at high speed and is aimed at the solid and semi-solid contents in the tank so that they are dislodged and liquefied. The heat reduces the viscosity of the cleaning media, further facilitating this process. Inorganic residue such as sand and rust settle on the floor of the tank, while the organic components in the sludge are dissolved.

Inert atmosphere

The empty space in the tank is made inert with nitrogen to prevent a build-up of static electricity during the individual cleaning phases. Moreover, the oxygen content is monitored throughout the whole process. If oxygen levels reach a certain point, the tank cleaning system automatically shuts itself off.

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