

Customer magazine

# up<sup>2</sup>date

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ALWAYS IN ACTION –  
IDEAS AND PROJECTS 24/7

## Services

BUCHEN's specialist sewer service division inspects the condition of manholes and sewers using cutting-edge technology

## Group News

Successful collaboration work to repair recirculation shafts by XERVON and S. Schlüssler Feuerungsbau

## International

XERVON masters the special challenges of a turnaround at a refinery in Norway

Well prepared for the future

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Well and truly cleaned

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## EDITORIAL

Dear Readers,

This latest issue of our "up2date" magazine presents a selection of projects that illustrate perfectly just how flexible and imaginative BUCHEN and XERVON can be. The focus of our activities is always on providing services that genuinely benefit our customers: to achieve this, we develop special solutions for – and together with – our customers to ensure their processes run even more smoothly and even more effectively and, in many cases, to further improve their already high safety standards.

The new hopper that BUCHEN-ICS designed for filling reactors with catalyst is an excellent example of this. You can read all about it on pages 16/17.

A number of awards have been presented to our companies recently and these are further proof of our determination to drive innovation and project development. Such as the one from our customer, CEMEX OstZement GmbH, which was awarded to us for an innovative scaffold that we designed and erected and that considerably increased work safety levels (pages 20/21).

Unusual building projects are always exciting – and challenging, too – as was the case with the restoration of the Basilica in Amberg, Bavaria, which called for bespoke scaffolding structures and a whole variety of complex solutions for transferring the different loads (see pages 14/15).

Not only can you rely on the creative solutions drawn up by our employees, you can also rest assured that we only use the best technology available. Each year, we invest in state-of-the-art equipment, for example in the area of CCTV sewer inspections (article on page 9). Fourteen special vehicles are available, each equipped with cutting-edge technology for inspecting pipes and manholes and for providing our customers with the best possible picture of their underground networks. Our results are used to plan maintenance work and to ensure legal regulations are complied with.

We also continue to further develop the structure of our companies to make sure we are well prepared for upcoming challenges. We have, for example, already reacted to the needs of our customers and the market by transforming XERVON Plastocor and XERVON Bauwerkserhaltung into independent companies. In this issue, you can read about how XERVON's maintenance expertise has now been merged together to become XERVON Instandhaltung GmbH. This was a logical step to ensure our maintenance experts can react more quickly and more sustainably to the needs of their customers and focus fully on the requirements of the maintenance sector. Turn to page 4 to find out more.

As always, we hope that you will learn some new, interesting and even surprising facts as you browse through this issue!



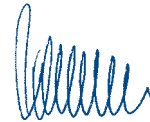
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Maintenance

# Well prepared for the future

## MAINTENANCE SERVICES UNITED UNDER ONE ROOF

In the past, XERVON's wide range of specialist maintenance services had been provided by a number of different regional businesses. Following the decision to unite these services under one roof, XERVON Instandhaltung GmbH was set up (with retroactive effect from 01 January 2014) and has been offering its services to its customers since 01 July 2014. This new company is based in Münchsmünster in Bavaria – one of biggest areas served by the XERVON maintenance specialists. A number of other businesses have joined the new company including XERVON's other facilities in Bavaria, its branches in Köln-Merkenich, Lünen and Salzbergen, its facility in Hamburg and its materials management and maintenance businesses in Lingen. With the demand for maintenance growing all the time, this strong network will now be able to provide its comprehensive range of maintenance services across the whole of Germany.

By setting up specialist companies, the REMONDIS Group is looking to react more effectively to market changes and developments and indeed help influence them – to benefit its customers

One of the main reasons for uniting these specialist services was to make the business even more flexible. A clearly structured group of efficient and flexible company units with short and effective lines of communication can respond to the exact needs of their customers when they concentrate completely on their core business – in this case maintenance work. By focusing on this specialised field, they can draw up bespoke and highly efficient solutions. Moreover, by setting up individual specialist businesses, XERVON can react far more effectively to developments and changes in the market as well as to new technologies. Indeed, they can play an active role helping to shape such developments and implement them in their everyday work – to the benefit of their customers.

### What services does a modern maintenance business provide?

Germany has a well-established network of chemical and petrochemical companies. These are located in a number of regions around the country and must compete against large international corporations. There are a variety of ways in which they could improve their maintenance set-up – for example through optimising processes or altering the way they manage their materials and spare parts. Thanks to their years of experience, the XERVON maintenance experts are able to draw up innovative, future-oriented solutions helping to give their customers that vital competitive edge.

The new company, however, will also be able to create new business opportunities for itself in other industrial sectors in which XERVON has made a name for itself over the years providing – primarily – individual high quality services. It can now, for example, offer a much wider and more varied range of services and create highly efficient packages to suit their customers' exact needs. In addition, they can develop complex, long-term maintenance strategies and so help grow the value of their clients' businesses. Having worked in the maintenance sector for over 45 years, XERVON believes this new company is more than capable of developing and implementing bespoke concepts for each and every sector – each one specially adapted to meet the specific individual requirements.

Looking ahead, one of the key tasks for the company in the future will certainly involve creating and setting up effective IT systems with greater network connectivity. Such networks enable the users to access data and information that is essential for deciding how best to optimise maintenance processes. XERVON Instandhaltung GmbH intends to follow and play an active role in this innovative field so that they can work with their customers to further improve the quality and speed of their maintenance processes.

#### **A lack of specialists? No, thank you!**

For it to fulfil these high expectations, XERVON Instandhaltung GmbH has a workforce of employees with a wide range of qualifications and skills. Naturally, considering the services the company offers, the majority of them are tradespeople. They are absolute specialists in their field, many of whom were trained by the company itself – such as the apprentices at the company's Münchsmünster branch who, over the years, have often been named the best in their year. Apprenticeships for technical professions are in high demand at XERVON and we intend to considerably increase the number of apprentice jobs we offer in the future.

We have also been working together with a group of partners for many years now, in particular FMS and IPS. These two companies have a large pool of dedicated,

flexible and highly qualified employees who can be deployed at short notice to help XERVON carry out its many varied tasks. This has proven to be particularly effective during major shutdown projects.

On the other hand, the company has a team of highly qualified technicians and engineers who support XERVON Instandhaltung with their expertise. They help, for example, to plan and implement projects as well as to develop the often extremely complex maintenance concepts. Furthermore, XERVON collaborates with research and development departments at universities and colleges to learn about future trends and innovations at an early stage of their development. The creation of the new company, XERVON Instandhaltung GmbH, will also be helpful in this area as the management team will be able to further enhance the firm's profile and target the most suitable candidates on the job market.

#### **Smaller but just as financially sound**

The financial strength of XERVON Instandhaltung GmbH remains unchanged with its parent company, REMONDIS, in the background providing it with the support it needs. XERVON Instandhaltung GmbH continues, therefore, to be a strong, reliable and highly efficient partner capable of carrying out a whole range of projects, no matter how big they may be – whether it be operating industrial/chemical sites, planning and performing major shutdown projects or carrying out everyday maintenance work as part of a long-term service agreement.

XERVON Instandhaltung is focusing on developing effective IT systems with greater network connectivity so it can further improve the quality and speed of their customers' maintenance processes



The managing directors of XERVON Instandhaltung GmbH (from left to right): Peter Herring, Thomas-Peter Wilk, Thomas Kramel

Scaffolding

# On the high sea

DIFFICULT SCAFFOLDING WORK BETWEEN SEALS AND SHRIMP BOATS

XERVON's scaffolding division has concluded a new and extremely interesting service agreement: since June 2014, the company has been responsible for all scaffolding activities on the Mittelplate Island, Germany's one and only offshore oil rig.

© DEA AG – Drilling and Production Island

It's 6 o'clock in the morning. Before starting work, XERVON project manager Thomas Kranig is able to enjoy a one-hour boat trip through the Wadden Sea nature reserve off the coast of Schleswig-Holstein. The view from the boat is never boring with the seagulls and other seabirds swooping close by, the seals languishing on the sand banks and, on the horizon, the steel structure of Germany's one and only offshore oil rig: the Mittelplate Island. For the most part,

Thomas Kranig plans, organises and controls the scaffolding work from XERVON's branch in Rellingen. At regular intervals, however, he also goes "offshore" to talk to the people on site. He meets with the customer's maintenance staff to discuss the complex scaffolding work that is due to take place, makes suggestions and is there to support "his lads" whenever they need it. "Being the project manager, I have to and want to know what challenges the people are up against on the oil rig."



XERVON has been responsible for all scaffolding work on the Mittelplate rig since the middle of 2014 – primarily complicated work scaffolds for various types of maintenance tasks. A short period of time was needed for the scaffolding experts to set up two scaffolding warehouses – one on the actual oil rig and another on the mainland in Cuxhaven – and now they feel well and truly at home in their new offshore workplace.

The Mittelplate oil rig is situated seven kilometres out to sea on the southern edge of the Wadden Sea nature reserve





Mittelplate lies on a sand bank in the Wadden Sea. Special protection measures are in place, therefore, to make sure nothing gets into the sea from the island

“There is a very special working environment on the rig.”

Thomas Kranig, Project Manager

### No “off-the-peg” constructions

The scaffolding specialists’ work is complex: 99 percent of all the scaffolds needed are specially designed structures (freestanding and suspended scaffolds) that deviate from the standard design and instructions for use provided by the manufacturers. Just recently, for example, a twenty-metre-long and eight-metre-high suspended scaffold was erected to enable anti-corrosion work to be carried out on the sheet pile walls. In the majority of cases, the experienced scaffolders are able to issue the scaffolding inspection reports themselves. XERVON, however, also collaborates closely with a firm of structural engineers who provide assistance when special calculations are needed, for example regarding load classes.

### Meticulous preparation work

The scaffolders’ everyday work is regulated by the rig’s stringent safety standards. They always have a device on their belts, for example, that immediately sends out a signal if it detects escaping gas; portable radio sets and cameras are forbidden because of the danger of explosion and, in many sections of the oil rig, wood may not be used in the scaffolding as it would be a potential fire risk. But this is nothing out of the ordinary for the experienced industrial scaffolders.

What was new was the two-day offshore training course which all employees working on the Mittelplate Island had to take part in so that they could learn basic offshore survival skills. As part of this course, they had to climb into a lifeboat and be dropped ten metres into the water below, jump into water in a survival suit, inflate life rafts in the water and learn how to fight fires etc. “A large number of employees took part in this offshore training course so that we can react flexibly to future scaffolding tasks on the Mittelplate rig. These operatives can now be deployed to the site really quickly if need be – for example if repair work has to be carried out at short notice,” explained project manager Thomas Kranig.

On average, up to eight XERVON employees work on the platform every day. Normally, they take a boat from their accommodation in Cuxhaven to the Mittelplate and then back again at the end of their shift. However, they do not have set working hours as the work they carry out is not only on an “as needed” basis, it also depends on the weather and the tides. Sometimes, therefore, the scaffolders find themselves having to stay on the oil rig overnight as their work was unable to be completed before the tide turned. ►

All employees scheduled to work on the Mittelplate oil rig had to take part in an offshore training course to learn basic offshore survival skills

- ▶ None of his colleagues have been upset about these arrangements, however, as the accommodation, meals and community spirit on the Mittelplate are excellent. Kranig continued: "There is a very special working environment on the rig. There is a great sense of camaraderie among the regular crew (who work in fortnightly shifts) and the operatives from the external companies. Everyone helps everyone else."

#### Strict procedures

Despite this, there is a very clear hierarchy: the boss on the Mittelplate is the so-called offshore installation manager; he is assisted by a maintenance supervisor and a nautical expert. All the different tradespeople working on the Mittelplate – for example the piping and insulation specialists – contact the maintenance supervisor when they need scaffolding to let him know what scaffolds are required and where they must be erected. The maintenance supervisor and offshore installation manager then discuss whether the scaffolding work could affect the rig's operations and whether

special safety issues have to be taken into account. As soon as the scaffolders arrive at the rig early in the morning, they are given a written assignment – commissioning them and giving them the necessary permission to carry out their work in that particular area of the rig. If necessary, they are also given special safety instructions.

This is the point when the work is anything but ordinary. The material must now be taken to where it is needed. However, no-one carries the scaffolding material around the rig on their shoulders. It must always be transported in special containers which are lifted into place by the crane operator, a member of the regular Mittelplate crew, in his portal crane. These are strict rules that must be adhered to at all times. Once the scaffolding has been erected, it is inspected and then approved by the maintenance supervisor. Only then may it be used. A procedure that applies without exception to each individual scaffold in line with the high safety standards implemented on the Mittelplate.

100 million tonnes of oil are estimated to be under the Wadden Sea off the west coast of Schleswig-Holstein



#### Top priority given to safety

The operator of the Mittelplate Island, DEA AG, is very proud of their responsible operations and long-standing safety record. Project manager, Thomas Kranig, is more than confident: "Our high quality work will also help contribute towards ensuring the rig's operations continue just as successfully and incident free as always!"

#### THE MITTELPLATE DRILLING AND PRODUCTION ISLAND

With the deposits estimated to be 100 million tonnes, Mittelplate is Germany's largest oil field. It is situated in the Wadden Sea off the west coast of Schleswig-Holstein. DEA AG's production company, Holstein, has extracted over 30 million tonnes of oil via the Mittelplate Island since 1987. The oil from the Mittelplate is transported to the mainland for processing via an underground pipeline. The drilling and production island is located 7 kilometres out to sea on the southern edge of the Wadden Sea nature reserve, which has been a protected area since 1985. This ecologically sensitive area presents a very special challenge as the operatives must take absolutely all environmental issues into account – both in the manner they work and the technology they use. Large sums of money have been invested in this island with many

of the facilities installed on the oil rig (70m x 95m) having been specially designed to meet the requirements of this highly sensitive environment. Absolute priority has been given to completely sealing off the island from the Wadden Sea.

The drilling and production island is built on a sand bank in the shape of a compact, leak-proof steel and concrete basin. The high sheet pile walls surrounding the rig protect it from the forces of nature. Nothing can escape from the island – even rainwater and spray is collected and treated. Seepage is not possible either. A comprehensive waste management system has been put in place to protect the Wadden Sea and North Sea. A variety of complex monitoring and control systems safeguard the drilling operations.





3D  
optical  
scanner

360°

Industrial services

# A wide-ranging programme

## CCTV EQUIPMENT FOR INSPECTING MANHOLES AND SEWER SYSTEMS

It makes no difference whether a property is a private home or a large industrial facility: anyone generating wastewater is obliged by law to have their pipes checked regularly for leaks and to have this work documented. A perfect job for the experts at BUCHEN's sewer service division who are able to shed light into the darkest of corners thanks to their state-of-the-art technology.

BUCHEN's sewer service division, with its three businesses in Köln-Niehl, Duisburg and Karlsruhe, focuses exclusively on professionally cleaning, inspecting and checking for leaks in sewer pipes, drainage systems and other pipe networks as well as oil/fuel and fat separators, collecting tanks and household pipe connections – always, of course, in accordance with all applicable regulations.

The company has a total of 14 special vehicles equipped with cutting-edge CCTV technology to enable it to perform

these specialist tasks. Their technology includes, for example, mobile camera systems, which can be attached to a variety of robotic crawlers and guided through the pipes by remote control or – if the robotic crawlers are too wide – pushed through the pipes. As the camera makes its way along the drains and pipes, it films the pipe network, digitally recording any damage so that the condition of the surface can be assessed. Pipes branching off from the main section can be examined using bendable cameras, so-called satellite cameras, which can be transported “piggyback” style. ►

14 sewer service vehicles equipped with cutting-edge CCTV technology are available to inspect sewers and manholes



► **High-tech = greater safety**

BUCHEN's sewer service division in Cologne recently acquired a state-of-the-art 3D optical scanner which allows the condition of manholes and other vertical structures to be assessed in a completely novel way. Attached to a special camera cable, it can be lowered into the manhole. As it slowly moves upwards, it automatically takes individual images of the surface (every 5 centimetres) which are then transformed by computer into a three-dimensional image. The result is a detailed and extremely realistic picture of the inside of the manhole.

**"The really difficult cases – for example when an operative needs to enter the sewer to carry out manual work – are not a problem for us either."**

Bernd Engelhardt, sewer service division manager

After the work has been completed, the operatives or the clients can then go on a virtual tour. They can move up and down, zoom in and out and rotate the image – allowing them to make an exact analysis of the general state of the structure. This technology has considerably shortened the time needed for damage assessment projects: in the past this work could only be done by operatives climbing into a manhole wearing extensive safety equipment and manually collecting the data themselves. Depending on the quality of the wastewater, they sometimes had to put on full body protective suits and use breathing apparatus.

However, no matter what camera technology is used for a project, they should always be operated by experienced CCTV inspectors as they alone know how to get the most

out of it. They not only have to guide the camera through the pipes from their computer workstation in the sewer inspection vehicle, they must also spot any damage to the surface of the drains or sewers and compile a detailed report on their computer. It is only possible to get a realistic picture of the overall state of the structure if the images are analysed correctly. Such work requires high levels of concentration, specialist knowledge and a trained eye. "All our CCTV inspectors have taken part in excellent training courses and have many years' experience of doing this work which means the services we deliver are of a correspondingly high quality. This is also underlined by the fact that external engineering firms and assessors regularly use the results of our surveys to plan renovation projects," commented Bernd Engelhardt, manager of the sewer service division at the company's Köln-Niehl branch.

**No surveys without cleaning work**

He and his colleagues believe that BUCHEN's portfolio of cleaning, inspection and leakage test services provides a number of other advantages as well. "Over the years, our company has built up a reputation of being a top quality cleaning specialist. And as the sewer pipes always have to be cleaned before they are inspected, we can combine these two services for practically every project. We have an extremely versatile set-up." The company is even able to take on complex projects involving long stretches of sewer pipes up to 400 metres in length or clean pipes with a large diameter or an unusual shape by using its specialist technology. The BUCHEN cleaning specialists have both the technical equipment and the know-how needed: combined high-pressure cleaning and suction vehicles, high-pressure

pumps, air conveyors (for example for removing sand that has accumulated in the sewer pipes) and special devices for removing solid deposits. "And the really difficult cases – for example when an operative needs to enter the sewer to carry out manual work – are not a problem for us either as we have the equipment to cover every possible situation," Bernd Engelhardt continued.

### The final stage: the leak tests

No matter how experienced and skilled the operatives may be or how well the sewers and drains may have been cleaned, it is not possible to detect the really small leaks or notice when seals are very slightly damaged. To rule these out, therefore, leak tests are always carried out once the inspection or renovation work has been completed. Air or water is pumped into the pipes to enable a pressure test to be performed. Diverse DIN EN standards stipulate exactly how such tests need to be executed which means they, too, have to be done by trained and qualified specialists.

### The greater the potential danger, the greater the number of inspections

Just how often pipe networks need to be inspected depends on their potential danger and the size of the business.

This includes major plants such as industrial, chemical and petrochemical facilities or electricity providers, which are subject to the 'VAwS' (Federal ordinance regulating facilities handling substances hazardous to water). These regulations are particularly stringent as environmentally hazardous substances sometimes flow through their wastewater networks. Such systems have to be checked for leaks every five years. Tests at industrial facilities often involve highly sensitive equipment – for example light liquid, fuel and fat separators where the inlet pipes also need to be tested. A further field of application: oil-cooled transformers at large substations operated by electricity providers. These stand on collection basins and are connected to separators. The whole of such pipe systems are subject to the 'VAwS' and so must be inspected every five years and include a leak test.

The second large group of customers served by BUCHEN's sewer service division are businesses that own property covering more than three hectares. Since 1995, companies in the German state of North Rhine-Westphalia (NRW) falling into this category must have all their drainage and sewer pipes checked by specialists – a regulation previously set out in the 'SüwVKan NRW' (Self-monitoring ordinance for sewer networks NRW) and now in the 'SüwVO Abw' (Self-monitoring ordinance for wastewater networks). The results of such tests are then valid for 15 years.

Their third group of customers are private households – as home owners have also been affected by the 'SüwVO Abw' (Self-monitoring ordinance for wastewater networks) since 2013 and must have their wastewater systems checked at certain intervals. The same applies to new build homes as well as to homes that have been renovated or undergone major conversion work. The local bylaws stipulate how long the owners have to commission such inspection work which depends on whether the property is in a water conservation area or not. Generally speaking, private wastewater systems do not have to be checked again for at least 30 years after their first inspection.

It often makes good business sense for large industrial facilities with extensive pipe and sewer networks to arrange a framework service agreement with a company to carry out such work, as the networks have to be checked regularly and within relatively short periods of time due to the stringent environmental regulations. "The CCTV inspection teams need several weeks, or in some cases months, to complete their tasks at large plants," explained Bernd Engelhardt. In contrast, pipe inspections at detached homes are normally wrapped up within three to four hours – including the cleaning work. "One thing is certain: no matter whether you own a home or a major industrial facility – we are the right port of call for every kind of inspection project."

The law stipulates that sewer and drainage systems must be inspected by specialists at regular intervals – and this applies to both major industrial businesses as well as to private homes

### NEW TECHNOLOGY, NEW FIELDS OF APPLICATION

The BUCHEN team can now perform additional tasks thanks to its new 3D optical scanner system: not only inspections below ground but now also high up in the air. The camera is perfect for assessing the condition of industrial chimneys. Their latest project: the three chimneys at the central heating plant at the exhibition centre in Cologne.





# Refinery undergoes TÜV inspection

## RUHR OEL GMBH IN GELSENKIRCHEN SELECTS XERVON TO MANAGE SHUTDOWN

What is a matter of course for car drivers, also applies to the operators of large industrial plants. At regular intervals, the TÜV inspectors turn up at the gates to check operations are running properly. Such events involve large amounts of maintenance work and it goes without saying that inspecting one of the largest refineries in Germany is not quite as simple as checking a vehicle. A whole range of tasks need to be coordinated – from the meticulous planning work, to sophisticated logistics, to the complicated scaffolding, insulating, welding and metal work – so that the plant is approved for a further five years. There are only a handful of companies able to provide all the services required for such a complex task. XERVON is among this small group.



The refinery and petrochemicals plant in Gelsenkirchen uses 12 million tonnes of crude oil to manufacture a range of 50 different products. These include the premium fuels sold under the "Aral" brand name, heating oil, jet fuel, bitumen and petroleum coke as well as approx. 3 million tonnes of petrochemical products which are primarily sold on to the plastics industry. The two plants operated by BP here are located in two separate districts of Gelsenkirchen (Scholgen and Horst), cover a total area of around 360 hectares and provide jobs for around 1,750 people. The production facilities are owned by Ruhr Oel GmbH, a joint venture between BP and the Russian oil company, Rosneft. Founded in the 1930s to produce liquid fuels from coal, the plant has since become one of the most modern refineries in Europe and one which places great importance on subjects such as safety and environmental protection.

Thanks to XERVON's support, top levels of safety were maintained during the turnaround carried out at Ruhr Oel GmbH

The last turnaround – aka TAR – at Ruhr Oel's Scholgen plant took place between the end of April and the middle of July 2014. Regular maintenance work has to be performed at refineries every five to six years. Individual facilities have to be shut down for several weeks to enable the inspectors to do their work. What though exactly happens during such a shutdown project?

As soon as the plant section has been turned off, mobile cranes are brought in and set up right in the middle of the production plants. Scaffolding is erected, insulation removed, containers opened up, engines, compressors and fittings dismantled. These steel giants, so-called columns used for manufacturing petrol and other products, are literally taken apart and stripped down into their individual component parts so that they can be carefully inspected. Safety and environmental protection are top of the list of priorities during such projects. Every part is cleaned, closely examined and, if required, repaired or replaced and then put back together again – right down to the very last screw. Once the facility has been turned back on again and everything works properly, the specialists take down the scaffolding and remove the cranes and any other equipment needed for the turnaround work. The plant section is then given the "TÜV seal" which is valid for the next few years. What sounds so simple is in fact a huge project that lasts for several months and begins well before the actual shutdown is due to take place. XERVON has been providing its services at the refinery for a number of years now and is permanently on site to carry out scaffolding and insulation work. The size of the



team was tripled to several hundred operatives for the turnaround and also included welders and metal workers from XERVON's maintenance division. The volumes of material needed for the scaffolding alone were immense, with the weight of the erected scaffolding totalling several thousand tonnes. To be able to handle such amounts, XERVON operates its own warehouse on the refinery's grounds. Preparation work for the turnaround began at the beginning of the year when the first scaffolding structures were also erected. The actual maintenance work was carried out in a two-shift operation during the project's core period. Transport logistics within the grounds were essential right from the start – for example while the heat exchangers were being dismantled and reassembled. Here, the tube bundle was removed, transported to where the maintenance work was to be performed, washed with high pressure jets, inspected and, if required, parts replaced or repaired before being returned and put back into the facility. Other maintenance tasks here also included measuring the thickness of the tube walls as well as removing and reinstalling any insulation materials.

Stable scaffolding is essential to be able to carry out all this work. One special feature of the plant in Gelsenkirchen is that the scaffolding structures need to be freestanding to prevent the facility parts from being damaged. Free-



standing scaffolds that are higher than 27 metres need to be calculated by structural engineers. Indeed, some of the structures erected at Ruhr Oel in Scholven were much higher than this 27-metre mark. The quality of XERVON's work was underlined by the massive storm that hit the area on Whit Monday 2014. Whilst buildings, vehicles and trees in Gelsenkirchen suffered badly from the storm, each and every scaffold erected by XERVON withstood the hurricane-force winds so that work at the plant could continue as planned. The project was completed and the plant's operations back to normal by the middle of July. Thanks to XERVON's help, Ruhr Oel in Gelsenkirchen has received the TÜV seal of quality – and confirmation for the next five years that its plant is fit for purpose.



The quality of XERVON's work was underlined by the massive storm that hit the area on Whit Monday 2014. All of XERVON's scaffolding withstood the hurricane-force winds





# Reaching the highest levels

## RESTORATION WORK CONTINUES ON THE BASILICA OF ST. MARTIN IN AMBERG THANKS TO SMART SCAFFOLDING SOLUTIONS

Erecting scaffolds around church spires is a challenging task that involves complex scaffolding technology. One essential component here is ensuring that all loads are safely transferred. The Basilica of St. Martin in the city of Amberg is no exception. The XERVON scaffolding experts had to come up with some smart ideas to enable the urgently needed renovation work to be carried out completely safely and as conveniently as possible on the church spire.

**200t**  
scaffolding material

**25t**  
steel beams

Sophisticated constructions involving large volumes of material were designed to ensure the scaffolding can bear the various loads

At a height of 92 metres, the spire of St. Martin is truly impressive. At the moment, however, it is hidden from view as the tower (basic size: 12 metres) and its copper onion dome have been completely surrounded by scaffolding. A team of up to seven scaffold specialists needed several weeks to erect this complex structure which involved 200 tonnes of scaffolding material and 25 tonnes of steel beams. Further sections have had to be added to the scaffold as the renovation work has progressed, for example it had to be fully enclosed with a tear-resistant and dustproof cover whilst work on the façade was carried out. It has by no means been a simple process to erect this scaffolding, especially as access to the tower is restricted.

The north side of the spire, for example, is in the middle of a pedestrianised area which has meant that crane work may only be performed – and supplies delivered – at certain times.

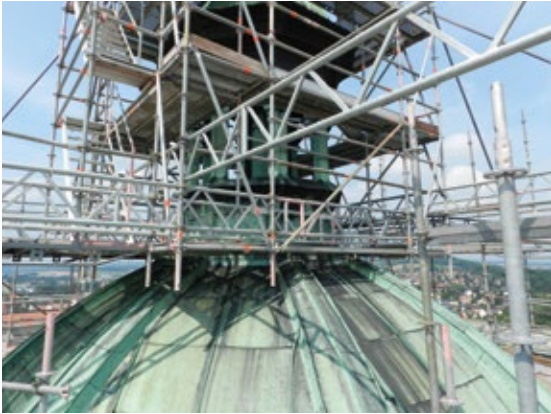
### Access for all trades

The tower has needed extensive restoration work done to it as can be seen by the long list of planned tasks – from restoring the natural stone masonry, to renovating the historic ceiling beams, all the way through to repairing the metal on the roof of the tower. The scaffolding specialists from XERVON's south-west region developed a complex scaffold construction to ensure all the workers have safe

The Basilica's 92-metre tower surrounded in scaffolding







XERVON's scaffolding specialists planned and calculated every section of the scaffolding for the Basilica in Amberg right down to the tiniest of details – an impressive example of their scaffolding expertise

access to the tower and can perform their tasks efficiently. This structure safely transfers all the loads to a suitable load-bearing surface. Due to the local conditions, very few sections of the scaffold are able to directly bear loads and transfer them vertically to the base. To solve this problem, therefore, special constructions of bar joists and steel beams were designed and erected to re-direct and distribute the loads.

With all these special requirements and conditions having to be met, no part of this scaffolding is a standard construction – on the contrary, it is absolutely unique with every single section having been planned and calculated right down to the tiniest of details. The west side of the tower, for example, is 23 metres long and is right next to the edge of the River Vils which means that the scaffolding has had to be protected against the force of the water and possible floods. The scaffold has, therefore, been erected on a special sub-structure which can bear any excess loads generated by faster currents or floods. Special scaffolding was also needed on the east side, where a self-supporting scaffold structure has been erected above the surface of the roof of the nave. Any loads generated here are transferred either straight to the tower via a steel construction or to the scaffolding on the north and west-facing sides via heavy duty bar joists. The base of the scaffold on the north side was extended to enable it to bear these extra loads. A further tricky task had to be performed in this area: around 20 metres of freestanding scaffolding had to be erected here.

The workers access the tower from the south side. Here, too, the base of the scaffold was extended to increase its load-bearing capacity. Thirty metres in height, this extension is topped by a 100m<sup>2</sup> load platform made from steel beams. A lift (max. load: 1,500kg) has been integrated into


the scaffolding here which transports the workers from the ground to the platform. A second lift (max. load: 500kg) then takes them from here to up to 80 metres above the ground. What is a slight breeze for the people in the market square is a strong wind at such heights that batters the scaffolding and tarpaulin covers.

Despite all these challenges, the XERVON scaffolding experts have succeeded in completing their tasks. The work being carried out on the tower is also well within schedule – not least thanks to XERVON's extensive experience gathered from similar such projects and their smart access solutions. Much of the renovation work has already been completed even though the damage to the tower was worse than had been expected. There is still a long way to go, however, before the work on the Basilica of St. Martin in Amberg has been completed. The next stage of the plan is to erect scaffolding around the whole of the nave so that the sandstone façade and valuable stained glass windows can be repaired.

#### THE BASILICA OF ST. MARTIN, AMBERG

The historic town of Amberg (approx. 42,000 inhabitants) dates back to the Middle Ages and is one of the best preserved cities in Europe. Situated around 60 kilometres east of Nuremberg on the River Vils, the town's market square is dominated by the Basilica of St. Martin. 72 metres long and 20.5 metres wide, it is the second-largest church in the Upper Palatinate region (the largest being Regensburg Cathedral). Construction began on the church in 1421; the upper sections of the tower were then rebuilt and completed in 1727. The architecture and interior furnishings of the church have been influenced by many different eras since then: the Gothic, Renaissance and Baroque movements as well as the Reformation and counter reformations. Today, St. Martin is a late Gothic 'hall church' with a Neo-Gothic interior. Its unusual architectural feature: all three sections of the church's nave are of the same height with the same pitched roof.





Catalyst handling

# Made to measure

**GREATER SAFETY THANKS TO NEW HOPPER**

BUCHEN-ICS, the Group's specialists for catalyst handling, have been collaborating closely with a large German refinery to modify the design of their catalyst hopper and make the whole process of filling a reactor considerably safer.

No matter what sector they may be in, large industrial businesses need catalysts to speed up their chemical reactions. These processes take place in large-scale reactors under strictly defined conditions. A wide variety of catalysts are used, with the choice of material depending on the process it is needed for. They all, however, have one thing in common: they all gradually become less effective over time and eventually have to be replaced.

This is the point when BUCHEN-ICS is called in. Over the years, this company has become one of the leading businesses providing reactor services in Europe. Indeed it is hard to find a refinery that has not used the specialist services of this innovative Cologne-based firm, which has been working in, on and around catalyst reactors and in inert atmospheres for over thirty years.



## THE DENSE LOADING PROCESS

BUCHEN-ICS has now developed a hopper together with one of its long-standing customers to make the process of filling reactors not only more effective but also even safer. The conventional hopper, which they had previously used for the so-called dense loading process, has been modified and improved to prevent employees "working under suspended loads".

Whenever operatives fill a reactor – in this first case a reactor almost 65 metres high – they must make sure that the catalyst (a loose granular material) flows uninterrupted from the hopper into the inside of the reactor. To be able to do this, they use a crane to lift the material (packed in 1.5m<sup>3</sup> big bags) off the ground and empty it into the hopper located at the top of the reactor. In the past, these big bags had to be opened and emptied whilst hanging from the end of the crane. This has all changed now: by altering the design of the hopper, the big bags can now be placed into the 3m<sup>3</sup> container before they are opened. Detachable walkways have been installed along two sides of the container to provide the operative with a safe platform.

That, however, is not all. The modified hopper has also been given a separate, specially designed supporting frame that fits the shape of the reactor perfectly. During the filling process, the container is bolted to the reactor via a flange plate so that the whole unit is secure and unable to move. This, too, is a unique safety feature.

When the hopper has been put together, it measures approx. 2.50 metres x 2.50 metres x 4.00 metres. However, it has a modular design to make it easier to transport. It is, therefore, taken to wherever it is needed in pieces and then put together in just a few quick steps. This new hopper can be used to fill a wide range of reactors.

Catalysts can be used a number of times in a reactor before they have to be removed and, if necessary, cleaned for re-use. A variety of methods can be employed to reload the reactors with catalyst. One of these is the so-called dense loading process during which large volumes of catalyst are placed inside the reactor using a special type of loading machine. A system of rotating parts distributes the catalyst evenly as it flows into the reactor. As the name suggests, the density of the catalyst in the reactor is up to 16 percent higher compared to other loading methods. The advantage of this process: the reactor can be used for much longer before the catalyst needs to be replaced.

A number of people made up the team that developed this practical hopper: the customer, the manager at BUCHEN-ICS responsible for the project and BUCHEN's own technical department. Together they drew up a list of what they wanted to achieve and then set about designing the hopper. Once this had been completed, the technical department created all the technical drawings needed to produce this innovative container. A prototype was not needed – the very first hopper fitted perfectly and has already been used a number of times.

The team at BUCHEN-ICS are proud of this new design: "We offer professional industrial services and our goal is always to provide our customers with the best possible solution – by optimising processes and, in particular, by ensuring all our operations are absolutely safe. It is, of course, even better when we can develop and implement projects together with our customers."

The new, safer hopper ready for use – during the filling process it is bolted securely to the top of the reactor so that it is unable to move





# Major shutdown a huge success

## TOTAL REFINERY IN LEUNA (CENTRAL GERMANY) UNDERGOES LARGE-SCALE TURNAROUND

Over 300 employees were deployed by BUCHEN and XERVON to ensure that the highly sophisticated cleaning and scaffolding tasks that had to be carried out during the inspection of the TOTAL refinery in central Germany (TRM) all went without a hitch. And their efforts paid off: they were able to successfully complete the shutdown in June 2014 without a single accident or incident.

Staff and equipment are brought in from across the whole of the country for such large-scale shutdowns

Months of intensive planning work were needed before the TRM Refinery could be shut down last summer for a general overhaul. One of the most important goals of TRM's management team was to make sure that "everyone got home safe and sound after their day at work". No-one, therefore, was permitted to enter the grounds until they had taken part in an intensive induction course and passed a test at the end. Each and every manoeuvre had to be signed off which meant the refinery had to prepare several thousand work slips in advance.

The BUCHEN and XERVON project managers had also planned the upcoming tasks in meticulous detail to make sure there were enough operatives and materials on the refinery grounds whenever they were needed. However, it is never really possible to see how well a team has prepared for every eventuality, until the actual project begins and everything runs like clockwork.

BUCHEN UmweltService sent more than 200 people to the site to perform the various cleaning tasks on the different facility parts during the shutdown.

Thomas Gerhardt, BUCHEN manager responsible for the east of Germany, was extremely pleased with the way the project went: "Our intensive preparatory work paid off." Working closely together with their clients, the BUCHEN experts carried out many tasks beforehand – to calculate the amount of people, materials and equipment they would need, to plan the various processes, to create an efficient on-site organisation, to discuss and select where the different pieces of equipment should be placed as well as to prepare the documentation to show that all tasks had been carried out in accordance with their client's instructions.

BUCHEN has been a reliable partner at the refinery from the moment it began its operations and has often been able to demonstrate both its flexibility and expertise. Specialist staff and equipment were brought in from other company branches across the whole of the country to ensure the shutdown went smoothly: less than one quarter of the operatives needed came from the local branch, which was established in Merseburg in 1991. The number of administrative employees needed for the project was also more than doubled. Board and lodgings had to be found for all of these extra employees, who also had to be instructed in the relevant rules and safety regulations.



### A TRULY IMPRESSIVE REFINERY

TOTAL's refinery at the chemicals park in Leuna is one of the most modern of its kind in Europe. Around 2.6 billion euros have been invested in the site, making it one of the biggest projects since the economic turnaround in the east of Germany. Following a three-year construction period, the refinery was commissioned in 1997 and is able to process 12 million tonnes of crude oil a year. Covering a total surface area of approx. 320 hectares (around 500 football pitches), the 630 employees there primarily produce petrol, diesel, heating oil, liquid gas, naphtha, aviation fuel, bitumen and methanol.



© TOTAL refinery

300



BUCHEN and XERVON employees were deployed to the site

3,000 t

of scaffolding material were erected and dismantled for over 2,000 individual scaffolds

This was certainly not a simple task but the planners are well accustomed to dealing with such jobs. Thomas Gerhard commented: "This was not our first major shutdown. We have carried out many other similar such projects in the past. And we learn a bit more each time which helps us to further improve our processes."

#### Well equipped

XERVON deployed 100 operatives to the site to provide the inspectors and maintenance workers with safe work platforms and smart access solutions during the project. These scaffolding specialists had also begun preparing a few months before the official start so that they could react quickly and flexibly should the people carrying out the shutdown in June need their help at short notice.

Working in shifts around the clock and with around 3,000 tonnes of material, the scaffolders provided essential assistance during the shutdown, erecting custom-made scaffold constructions wherever they were needed. Small scaffolds, indoor scaffolds, mobile scaffolds and suspended scaffolds – each and every type of scaffolding found within the industry was used during this project. A complex task as each one had to be carefully adapted to the different structural conditions of the refinery.

Often, the operatives had to erect the scaffolding high above the ground or in very tight spaces – with health and safety foremost in their minds for both themselves and for the workers for whom the platforms were being set up. All in all, XERVON erected over 2,000 individual scaffold structures – many of which were extremely complicated and needed to be specially calculated by structural engineers. This included, for example, erecting heavy duty scaffolds and setting up scaffolding inside furnaces and around towers up to 40 metres high.

XERVON also had a central scaffolding coordinator on site to ensure that everyone was not only provided with the right access solution but also that it was delivered exactly on time. Each day, he put together a list of all the different scaffolding structures needed for the following day and then discussed these with the various teams. Each individual construction manager then made sure there were sufficient employees and materials available for the work. By doing so, they were able to deal with the enormous time pressure they were under. "You know you're dealing with a competent scaffolding specialist when they are able to deploy the right amount of staff and material during such major projects, no matter how short the notice. The rest is simply routine," explained XERVON Manager Herbert Gönrich who was rightly proud of the contributions he and his team had made towards this successful shutdown.



Both the BUCHEN and the XERVON teams completed their tasks successfully – not least thanks to the meticulous preparation work they had done before the project actually began





# Improved ergonomics

## CEMEX PRESENTS AWARD TO XERVON IN RECOGNITION OF ITS WORK SAFETY

Thanks to their cleverly redesigned scaffold constructions, XERVON's scaffolding experts developed an extremely safe and ergonomic access solution for CEMEX, a company based in the German city of Eisenhüttenstadt, to enable it to carry out its maintenance tasks. Their efforts paid off – with CEMEX presenting XERVON with its work safety award.

Torsten Schenk, XERVON Scaffolding Site Manager (East Region, Eisenhüttenstadt branch) was presented with the award by Martin Rostock, Managing Director of CEMEX OstZement GmbH, on 11 June 2014



For over 25 years now, XERVON's Eisenhüttenstadt branch has been the partner of choice for all scaffolding work required at CEMEX's Rüdersdorf plant (near Berlin). The demand for scaffolding solutions at the cement works increases considerably over the winter break as this is the time that CEMEX OstZement GmbH traditionally performs any necessary maintenance work. XERVON organised a

three-shift work plan for the three-week shutdown period at the beginning of 2014, so that there were, on average, twenty XERVON scaffolders on site around the clock. Such tight schedules are always a challenge for the people organising and erecting the wide range of scaffolding required by the customer. In addition, they had to overcome the difficult working conditions found at a cement works – for example the high levels of dust in the filters.

XERVON, though, had prepared itself well for the winter project. The scaffolding experts completely redesigned the scaffold that was to be erected around the filter in the cooler. The decision was made here to employ Layher Allround® Scaffolding rather than the structure of wooden planks used in the past. The altered scaffolding design was not only a far more ergonomic solution for the maintenance workers, it was also even safer. Especially the people carrying out the sandblasting work, who had to wear full body protective suits, benefited from these newly designed work platforms.



An example of the Layher Allround® Scaffolding

# A highly coveted award

## AUTOMOBILE MANUFACTURER FORD HONOURS CONSORTIUM

Last year, ARGE TWM (consortium Total Waste Management) was presented with the Ford Motor Company's "World Excellence Award 2013" in recognition of its quality, cost performance and delivery. ARGE TWM, an association between REMONDIS Rheinland GmbH, Chemische Werke Kluthe GmbH and BUCHEN UmweltService GmbH, received Ford's Silver award for the category, "Total Waste Management & Industrial Cleaning Services".



The World Excellence Award is the highest annual recognition that the automobile manufacturer gives its suppliers – honouring all its contractors that have excelled in their contribution towards enhancing the quality of the Ford brand. 18 countries were represented at the 16th World Excellence Award event during which a total of 51 of the more than 20,000 suppliers working with Ford were presented with this award. A total of 13 Gold awards and 26 Silver awards were handed out at the ceremony, which was held at Ford's head office in the US town of Dearborn (Michigan) on 22 May 2014.

Marcus Rolffs (REMONDIS Rheinland) was given the honour of accepting the award from Mark Fields, CEO of the Ford Motor Company, on behalf of all those working at ARGE. During his speech, Marcus Rolffs made it very clear that he was accepting it for the whole of the team and praised the high quality of the work performed by each and every ARGE employee. Mark Fields congratulated all the winners and underlined just how important the suppliers were for Ford: "Congratulations to all of our supplier partners who have demonstrated a commitment to excellence as we together work to achieve mutual growth. Our suppliers are key to the success of our One Ford plan, including our commitment to accelerate our pace of progress and deliver even more of the great products and innovations that will create even more growth and define our company going forward."

ARGE TWM was established in 1997 to take over all waste management activities at Ford's plants in Germany and Europe. The ARGE partners are: REMONDIS, one of the world's largest recycling, water and service companies,

Kluthe, market leader for solvent and paint recycling, and BUCHEN, specialists for industrial cleaning work and industrial services. Their joint goal: to combine their know-how and expertise to continuously reduce the overall costs of environmentally sound recycling processes. All ARGE partners



Marcus Rolffs from REMONDIS Rheinland was presented the award at Ford's head office in Dearborn, Michigan, USA


have been certified in accordance with ISO 9001 ff, 14001 and 'Efb' (specialised waste management business). The ARGE disposal and recycling facilities are either operated by the company itself or have been checked that they comply with VDA standards. ARGE TWM is currently in charge of the Ford plants in Cologne, Saarlouis and Genk (Belgium).



51

51 of the more than 20,000 suppliers working with Ford were presented with this award





Refractory and scaffolding works

# A combined effort

SUCCESSFUL COLLABORATION WORK TO REPAIR RECIRCULATION SHAFTS AT A COAL-FIRED POWER STATION

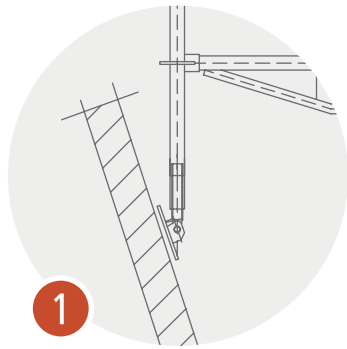
XERVON's subsidiary, Siegfried Schlüssler Feuerungsbau GmbH, joined their colleagues from XERVON's scaffolding division to carry out maintenance work on eight recirculation shafts at a brown coal-fired power station. With one of the 300 megawatt blocks shut down for an overhaul for four weeks, the experts moved in to carry out their tasks – first erecting scaffolding in the inside of the huge pipes and then relining the damaged areas.

By working hand in hand, the REMONDIS Group companies ensure projects are completed accident free, on schedule and to the complete satisfaction of their customers

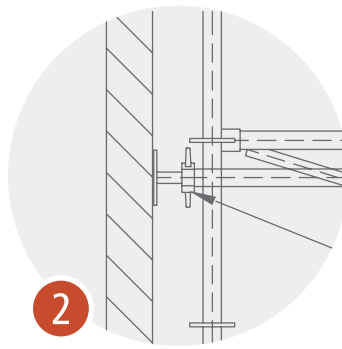
When operating normally, hot air from the boiler's combustion chamber flows through the almost 30-metre-long recirculation shafts that run vertically along the outside of the power station's boiler. These steel pipes – some of which slope down at an angle – have an outer diameter of a good three metres and are a part of the boiler system connecting the combustion chamber to the coal pulveriser. The damp coal falls down the flue gas recirculation shafts, where it is dried within seconds (at temperatures of up to 1,000°C) before landing in the coal pulveriser. Both the high temperatures and the mechanical wear and tear caused by the coal and steam mean that maintenance work has to be carried out on the recirculation shafts and their multi-layer refractory lining every two to four years. This lining generally consists of a wall (25 to 32 centime-

tres thick) built using special refractory firebricks as well as a top layer (up to 15 centimetres) made of refractory concrete. The lining is held in place by a heat-resistant stainless steel anchoring system that is welded to the steel plate of the recirculation shaft at regular intervals.

It is not possible to assess the condition of the refractory lining when the plant is up and running, as no-one can access the recirculation shafts until the power plant's boiler has been turned off and the system has cooled down. This means, however, that everything must be done really quickly once the work can start. The scaffolders are effectively the pioneers, enabling the inside of the shaft to be accessed, assessed and repaired – all the way from top to bottom.



Swivel base jack



Clamp on levels 1–3

A detailed view of the specially designed scaffolding structure in the inside of the recirculation shafts



“We were very busy beforehand preparing meticulously for this particular scaffolding task,” explained XERVON project manager, Karl-Heinz Schwabenhausen. The support given by the refractory specialists was also extremely important for this project. “Our colleagues have been working at the site for many years and know the plant inside out. It was a first for us, though, as we hadn’t erected scaffolding in the recirculation shafts in this particular block before. Our colleagues from Schlüssler were able to give us some invaluable information, especially regarding logistics and the transport of materials.”

The scaffolders erected 25-metre-high scaffolding in the inside of each shaft (internal width: 1.46 metres) using an adjustable modular scaffolding system. “This meant we could react flexibly to the different dimensions of the shafts.” With such a tight schedule to keep to, the operatives worked almost around the clock so that the eight work platforms were erected and ready for use within a very short time indeed.

Using the scaffolding, the condition of the recirculation shafts was then assessed, any damage documented and a plan of action drawn up for the repair work. Schlüssler’s refractory specialists then immediately got to work: the damaged areas were first removed using pneumatic hammers and then relined with replacement refractory material. Other operatives ensured that there was a steady supply of materials on hand to complete the job.

“The biggest challenge of such projects is not knowing beforehand exactly how much work will need to be carried out,” commented Cord Schade from Schlüssler Feuerungsbau, explaining the problems they had to face. He continued: “This is where our decades of experience really help. Once, we even had to completely reline all eight shafts. That was a truly masterful performance working out the logistics and completing the work within the tight schedule.”

Not quite so much work was needed during this latest project but everyone involved was still proud of the fact that they succeeded in completing their jobs according to schedule and without a single accident. “It is certainly true to say that the scaffolding team we brought in was being watched very closely,” Cord Schade continued. “But we were able to prove that together we are a highly effective and competent team.”

#### BACKGROUND INFORMATION

XERVON’s subsidiary, Siegfried Schlüssler Feuerungsbau GmbH, is based in Bispingen, a town in the Lüneburger Heide region (Lüneburg Heath) in the north of Germany. The company has been offering its refractory services for more than four decades now – lining industrial furnaces and boiler systems with suitable refractory materials. With a workforce of over 100 people, this international business is able to develop a wide range of innovative refractory solutions for its customers – no matter whether it involves new build, repair, maintenance or renovation projects.



# All hooked up

## INSPECTION OF A NORWEGIAN REFINERY CREATES A NEW CHALLENGE

XERVON Instandhaltung (maintenance division) was called in to carry out maintenance work on eighty heat exchangers during an inspection of a large Scandinavian refinery, scheduled to take place over a period of several weeks. 45 highly qualified specialists travelled to the west coast of Norway with their extensive set of equipment, where they successfully completed their tasks in accordance with the extremely high safety standards typical of the country.

"This maintenance job really was a success story," commented Thomas Kramel, managing director of XERVON Instandhaltung GmbH, who was extremely proud of his team. "It involved a completely new challenge for us which we mastered perfectly, right down to the very last detail." He was, above all, referring to the extremely high safety standards of the Scandinavian oil industry, whose regulations, for example, do not permit tools to be used that are unable to be secured to prevent them from falling down. Tools up to a certain weight can be used if they are attached to a special belt. Heavier tools, however, which are needed above a certain height, have to be secured to special devices connected to steel structures or scaffolding.

"The Norwegian oil industry's stringent safety guidelines originate from their offshore oil rigs. Such work places are regulated by particularly strict rules and these also apply to the whole of its refinery industry," explained project manager, Christian Dirscherl, who was in charge of this particular project. Another difference to inspections carried out at German refineries is that the individual contractors are always awarded contracts based on a specific type of equipment and not for whole areas of a plant. Put in concrete terms, this means that one service provider is, for example, in charge of servicing all the vessels at the plant. Another contractor is responsible for all the towers during the inspection period and a third company for all the heat

exchangers – which was XERVON's task in this case. Everything began back at the beginning of 2013, when the operators of the Norwegian refinery travelled to Germany to take a look at XERVON's various maintenance branches and check whether XERVON was the right partner for the turnaround planned to take place in the autumn of 2014. Things moved quickly after this successful prequalification stage, with the company asked to submit an offer which then led to them being awarded the contract.

"We did, of course, prepare very carefully for this project, travelling beforehand to the site, drawing up a detailed plan of the staff and teams to be deployed, instructing our employees about the stringent safety regulations and investing in a completely new set of tools," commented project manager Dirscherl as he summarised the work they performed in the months leading up to the turnaround. "We had to find new suppliers to get hold of the tools as they weren't available in Germany." At the end of the day, the tools they needed were conventional hammers, spanners, flange spreaders, tube wrenches etc. The difference here was that they all had to be fitted out with special attachments – such as rings or tapes – for the project in Norway so that they could be secured to prevent them from falling down.

They eventually found them in another European country – and even managed to impress the Norwegian inspectors

During this project, the operatives were only permitted to use tools which had been secured by special devices to prevent them from falling down



when they opened up the container to approve the equipment on its arrival and found a complete set of brand new tools inside.



A total of eighty heat exchangers of different makes and sizes had to be overhauled during this major turnaround project, which lasted from the beginning of September to the beginning of October. XERVON's maintenance specialists not only had to dismantle and reassemble the tube bundles. The five groups of experienced refinery experts also had to coordinate all the ancillary tasks, such as the scaffolding and insulation work.

Overhauling heat exchangers at refineries is most definitely a job that can only be performed by trained personnel. As was the case in Norway. To begin with, the heat exchangers had to be separated from the rest of the system, before the shell could be dismantled and the tube bundle extracted. Special equipment was used by the maintenance experts at this point to ensure this decisive step was carried out without incident.

Once this had been done, a crane was used to place the bundle on a low loader trailer so it could be taken to a central washing area where it was washed, checked and, if needed, repaired – a task for the refinery's own personnel or another contractor. As soon as this work had been completed, XERVON's maintenance staff reassembled the heat exchanger. The same special machine used to pull the bundle out of the heat exchanger was adjusted so it could push it back in. A pressure test was then performed once all the

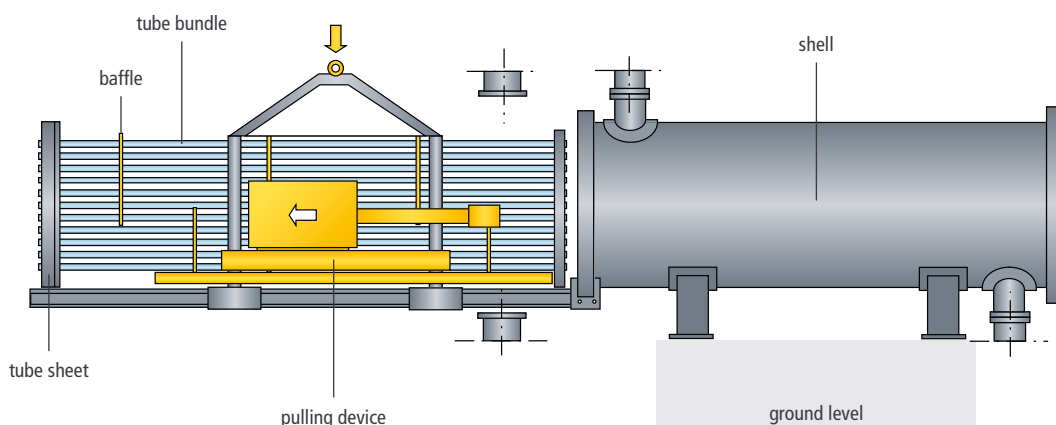
screws had been replaced by hand. The safety and quality control regulations in Norway also specify that each individual screw must be replaced with a torque wrench to achieve a precise predefined torque setting and that this must also be documented. One of the refinery's inspection teams then checked again to make sure that the torque setting was correct. Only then was the pressure test allowed to be performed and the heat exchanger approved for use.

Both the ancillary work and the individual work steps carried out by the XERVON team were coordinated and managed by XERVON's so-called supervisors. Each day, they met up with the various teams to discuss both the work that they had to do the following day and the ancillary work that was due to take place. Another of the tasks of the supervisors was to update a database, entering the progress that had been made each day. And the results achieved each day were indeed impressive. "It couldn't have gone any better," said Christian Dirscherl, summing up the project. "Even the weather was kind to us. We had three and a half weeks of sunshine." The overriding reason, however, for completing the project without a single accident or incident can be put down to the teams of dedicated staff, who carried out each and every task in accordance with the rules and regulations. "We're really proud of them," Dirscherl concluded. "They were the key to our success."

XERVON Instandhaltung received an award from the refinery operators in recognition of its excellent work safety standards during the turnaround work



## Bundle extraction system



An illustration of the system used to extract the tube bundle



Industrial cleaning work

# Well and truly cleaned

## BUCHEN CLEANS A NEW HYDROCRACKING UNIT IN RUSSIA

Last year, BUCHEN travelled to the City of Khabarovsk in the Far East of Russia to prepare a newly installed hydrocracking unit for commissioning: around 35,000 metres of pipes were cleaned using chemical and hydro-mechanical processes – outdoors and in temperatures permanently below zero, sometimes even  $-20^{\circ}\text{C}$ . In addition, the BUCHEN specialists filled the unit's reactors with catalyst ensuring the production activities could be started.

Acting as the general contractor, the Spanish engineering firm, Técnicas Reunidas S.A. (TRSA), had delivered and built the new hydrocracking unit for the Khabarovsk Refinery, which is owned by the Russian oil company, Alliance Oil. The aim of this project was not only to increase production capacity but also to extend the production processes in order to be able to break down the crude oil even more and so offer a wider selection of high quality products (such as diesel, heating oil, petrol of Euro-4 and 5 quality). A number of steps were undertaken to achieve this goal, including installing a new hydrocracking unit. During the first half of 2014, the Russian company, "BUCHEN Industrial Services 000", was then called in to clean it using intensive chemical and hydro-mechanical high-pressure processes as well as to fill it with catalyst so it could be commissioned for use.

The company, which is based in Ufa (approx. 100 kilometres west of the Ural Mountains) is a well-known name on the Russian market for industrial services. Refineries, chemical and petrochemical businesses and power stations regularly call on the BUCHEN experts to carry out their highly specialised work. Its portfolio of industrial services is very wide-ranging and includes high pressure cleaning work, vacuum work and special transport as well as tank cleaning work, catalyst services and chemical cleaning work.

Whilst the cleaning work itself was nothing out of the ordinary, the size of the project in Khabarovsk was: none of the BUCHEN specialists had performed chemical cleaning work on this scale. Never before had they treated a whole hydrocracking unit using this process. Highly motivated, they set about meticulously planning their cleaning and catalyst services – work they actually carried out between February and June 2014.

## 800,000km<sup>2</sup>

The Far East region of Russia stretches all the way to the Pacific coast and, covering almost 800,000km<sup>2</sup>, is one of the largest administrative districts in the Russian Federation. Its capital, Khabarovsk, lies on the Amur River close to the border to China. The distance between Moscow and the centre of this region is – as the crow flies – a good 8,000 kilometres



The chemical cleaning process was necessary as several years had been needed to build the hydrocracking unit. This meant that during that period individual parts had begun to rust. Moreover, the grease and oil used to produce the processed metal sheets and pipes had adhered to the surface of the metal. All these impurities had to be removed before the unit could be started up. Hydro-mechanical cleaning processes could only be employed on the few parts of the unit that were straight. Chemical cleaning was the only option for the parts that had been assembled or welded together. A number of different stages and special technical equipment are needed here: various chemical pumps (with a capacity of between 50m<sup>3</sup> and 250m<sup>3</sup> per hour), mixing and dosing tanks, chemical hoses as well as various types of analytical devices.

The various steps involved in a chemical cleaning process include cleaning (removing grease and oil), pickling to remove rust, passivation (protective layer) to prevent rust reappearing, and – the last step – to completely empty the unit. Moreover, any wastewater generated by each individual stage must be neutralised using environmentally sound processes.

#### HYDROCRACKER



Hydrocracking units are the centrepiece of modern refineries. Put simply, these units break down heavy oil (in the presence of hydrogen) to transform it into intermediary products which can then be used to produce petrol, kerosene and diesel

The chemical cleaning work was successfully completed by the end of April – despite having to cope with the huge distances and the difficult environmental conditions, such as temperatures permanently far below zero. Two separate trips had to be made to fill the unit with catalyst – with sixteen reactors, six adsorbers and a furnace being loaded with the catalyst material.

The project came to a successful close in the summer of 2014. A challenge that the BUCHEN team mastered together thanks to their experience and dedication. The result was a ready-to-use unit that was commissioned, as planned, at the end of July. BUCHEN'S client, Técnicas Reunidas, was certainly impressed by the professional way they had performed their tasks.



## Recycling vs Climate Killers

Germany has already achieved the first sub-goal set out in the Kyoto Protocol: to reduce methane emissions by a factor of 20. This gas – generated by rotting organic material on landfills – is 26 times more harmful to the climate than carbon dioxide. Closing these landfills, focusing on systematic recycling activities and cutting carbon emissions from waste incineration plants have all taken us a step closer to reaching the Kyoto targets.