Interview with Gerd Lesser

Gerd Lesser: Our business is subject to different cycles than the general economy. The need for clean and efficient power plants also grew over the course of the crisis. On the other hand, the political situation in Germany in 2010, as it relates to power plant construction, was just as unfavorable as in the year before. We were able, however, to make up for that with our broad portfolio – with modernizations and the stable services business for example. Overall, our growth rates in 2009 were disproportionately high as a result of major orders from previous years; with a moderate development in 2010 we have returned to a normal level.

There is resistance to the construction of new power plants in Germany. What strategy is Power Services using to counter this situation?

New power plant construction will increasingly take place outside Germany. We are working to transfer the entire portfolio currently available in Germany to international markets – by shifting our knowledge base and through the qualification of our employees on site. A further focus is the acquisition of companies whose potential can complement our service offerings in the target country.

With regard to new international markets: do growth regions such as Central Europe, China and India have a role to play this year?

Indeed. Central and Eastern Europe will certainly continue to represent growing markets for us. The focus there is on modernization and conversion in accordance with European standards as well as the construction of new power plants with coal, nuclear energy and natural gas as fuel sources. There is a lot of construction in China, most of it without rigid technological demands. That’s something that the Chinese companies can cover themselves. In India, we are not yet completely clear how the industry will develop. Our strategy there: expand carefully and keep an eye on the market. South Africa, with its enormous energy requirement, will remain a growth region for us. As will the Arabian Gulf region, whereby the emphasis will shift toward Saudi Arabia and Qatar. The United Kingdom is also interesting: they’re planning the construction of several nuclear power plants.

From your perspective, what were the key issues on the Bilfinger Berger Power Services agenda in 2010? What were the most interesting projects, the most important orders?

With the modernization of Europe’s largest lignite-burning power plant in Belchatow, Poland, we won the biggest order in our company’s history at the end of 2010. In terms of technological complexity, I would point to the ongoing conversion of a Belgian coal-burning power plant to alternative firing with blast furnace gas and biomass. Structurally, the expansion of the holding with new central departments which will help us prepare for the future is worth mentioning. And finally, the acquisition of Rotring Engineering gives us an important addition in the area of fuel treatment systems.

A solid foundation for 2011 and beyond
A talk with Gerd Lesser about the outlook for Bilfinger Berger Power Services Group

In 2009, Power Services achieved solid growth and good results despite the economic crisis. How did the Group fare during the economic upswing in 2010?

Gerd Lesser: Our business is subject to different cycles than the general economy. The need for clean and efficient power plants also grew over the course of the crisis. On the other hand, the political situation in Germany in 2010, as it relates to power plant construction, was just as unfavorable as in the year before. We were able, however, to make up for that with our broad portfolio – with modernizations and the stable services business for example. Overall, our growth rates in 2009 were disproportionately high as a result of major orders from previous years; with a moderate development in 2010 we have returned to a normal level.

What impact is the Company’s new status as an individual business segment of the parent company, Bilfinger Berger SE, having? Does this change represent a confirmation of the successful course Power Services has followed in recent years?

Yes, and there too we are reacting to the skepticism toward large-scale power plants. Specifically, our “PowerBlock” project is targeted to the supply of mid-sized companies, office buildings or hospitals with combined heat and power systems (CHP). Our engineers, together with scientists, are developing a “miniature power plant with a micro-gas turbine” in accordance with our usual high efficiency standards. We are also focusing on the firing of biogas; here, too, we took a significant step forward in 2010.

The integration of acquired companies is among the most significant challenges faced by management. Is there a blueprint for success?

Yes, Concrete, structured deliberations are currently underway on the acquisition of further companies and we will likely be in position to report one or more takeovers already in 2011.

What are the prospects for development in financial year 2011 and beyond? Will we continue to see growth at Power Services?

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A close network of branches links the activities of Power Services in the most important markets in Europe, the Middle East and in South Africa. In financial year 2010, the Group employed over 7,200 people, including approximately 3,200 in Germany. There were about 265 apprentices among the company’s employees at the end of the last financial year. Power Services achieved an output volume of €1,106 million in 2010. With its subsidiaries and associated companies, Bilfinger Berger Power Services is a leading services provider in the energy generating industry. About half of the company’s volume is generated in Germany.

The Group’s core business is focused on steam generators, piping technology, energy and environmental technology as well as mechanical apparatus and plant engineering. In these divisions the Company offers, in addition to maintenance and repair, complex measures to deliver service life extensions, efficiency enhancements and the rehabilitation of power stations. The subgroup is also involved in new construction and conversion and delivers components – partially of its own manufacture. A range of well-known companies value the engineering expertise of the operating companies as well as the competence it has in project management and power plant service.
**Our joint history**

### Important stages in the development of Bilfinger Berger Power Services

**1824**
- Construction
- Locomotive and mechanical engineering

**1855**
- Paper manufacturing, boiler construction

**1898**
- Babcock Noell GmbH

**1906**
- BHR Hochdruck-Rohrleitungsbau

**1952**
- MCE Aschersleben GmbH & Co. KG in Linz

**1956**
- EHR Essener Hochdruck-Rohrleitungsbau

**2000**
- License purchase for modern flue gas desulfurization systems from Babcock & Wilcox, USA

**2006**
- Majority acquisition of IKC Groups, South Africa

**2009**
- Acquisitions of Babcock Borsig Service Group

**2010**
- Takeover of Rotring Engineering

**2010**
- Acquisition of Babcock Power Services GmbH

**2013**
- Acquisition of Babcock Borsig Service Group

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**Strictly speaking,** the history of the Bilfinger Berger Power Services Group only began in August 2003 when Deutsche Beteiligungs AG bought the healthy and profitable Babcock Borsig Service Group following the bankruptcy of Babcock Borsig AG. And yet, the relatively young company Bilfinger Berger Power Services GmbH has the expertise and experience of many companies with decades of tradition.

Three main companies belonged to this group: Babcock Borsig Service GmbH has its origins in two organizations familiar to the world over: Babcock, a boiler specialist active in Germany since 1886 and Borsig, a locomotive and mechanical engineering company. Babcock Noell GmbH has its roots in the casting and forging company Noell, which was founded in 1824 and which later focused on specialty cranes and, since 1967, on reactor construction. Steinmüller-Instandsetzung Kraftwerke Gesellschaft für Energie- und Umwelttechnik mbH was formed from the former Steinmüller group which began its existence as a paper manufacturer and which has been making a name for itself since 1873, primarily as a specialist for boiler construction.

With these three main companies, the now independent Babcock Borsig Service GmbH was already a strong provider in the field of power plant technology. As early as December 2003, the company was able to settle its liabilities from the insolvency plans well before the due date and was thus financially independent. In December 2003, the company was able to settle its liabilities from the insolvency plans well before the due date and was thus financially independent. In the same month, the company was in a position to repurchase the business area, whereby experts in the Babcock Group had already had many years of experience in the construction of desulfurization systems.

### Executive Management

**Gerd Lesser**  
Chief Executive Officer  
Bilfinger Berger Power Services GmbH

**Ronald Diehl**  
Managing Director  
Bilfinger Berger Power Services GmbH

**Alexander Neubauer**  
Managing Director  
Bilfinger Berger Power Services GmbH

### Advisory Board

**Chairman**  
Joachim Enenkel  
Member of the Executive Board of Bilfinger Berger SE

**Deputy Chairman**  
Peter Koppers  
Principal Authorized Representative of IG Metall; administrative office OB

**Gunther Brückner**  
Chairman of the Workers’ Council at BNG

**Rudolf Honemann**  
Member of the Workers’ Council at BHR

**Hans-Jürgen Klöfflesch**  
Chairman of the Workers’ Council at BBS

**Frank Koconka**  
Chairman of the Workers’ Council at BBS

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Since March 2010, the Power Services Group has formed one of the five business segments of the now European stock company Bilfinger Berger SE.
Report on the situation of Bilfinger Berger Power Services GmbH

Business activities
The Bilfinger Berger Power Services Group is among the market leaders in the divisions Steam Generators, Piping Technology, Energy and Environmental Technology as well as Mechanical Apparatus and Plant Technology. In addition to maintenance and repairs, Power Services offers sophisticated measures for service life extensions, efficiency enhancements and for the rehabilitation of power plants.

The range of services in the area of steam generators stretches from engineering through to the assembly of completely new steam generation systems and the repair of individual components. In addition to high-pressure piping systems for power plants, Piping Technology also covers other industrial piping systems as well as plant engineering and assembly. The Energy and Environmental Technology division includes services in the nuclear and magnet technology product areas, such as the delivery of containment liners for modern nuclear power plants. The range of services in the Mechanical Apparatus and Plant Technology division comprises components for water, gas and steam turbines for the aerospace and chemical industries. The Group is active primarily in Germany, Europe, South Africa and the Arabian Gulf region.

Situation of the Company
Orders received in financial year 2010 were € 1,288 million, representing a significant increase over the previous year. The modernization of the Polish power plant Belchatow with an order volume of approximately € 440 million was the largest single order in the history of the company. Order backlog increased from € 1,137 million in 2009 to € 1,378 million in financial year 2010. Output volume also increased in the past year moderately – from € 1,017 million in 2009 to € 1,306 million in 2010. It was thus possible to continue the successful trend. The acquisitions made in the past year were once again fully financed from our own liquidity. The high net liquidity of the previous year was reduced in accordance with our planning, but it nevertheless remained at a high level.

Development of the divisions
The divisions of the Bilfinger Berger Power Services Group again benefited from an increasing demand for energy and from the necessary renewal of the power plant pool. In the Steam Generators division, the services business in particular performed extremely well; major modernization orders offset the decrease in awards for new construction. The manufacturing facility in Pretoria was working to capacity; there, too, we are seeing strong demand for services. In the United Arab Emirates (UAE) business decreased in the wake of the financial crisis. This development was offset by strong new activities in Saudi Arabia. Business in the Piping Technology division remained strong and highly profitable. BHV Hochdruck-Rohrleitungsbau GmbH (BHR) is playing a key role in nearly all projects involving the new construction of coal-burning power plants in Germany. In South Africa, BHV Piping Systems put its new inductive bending machine into operation and, on the basis of the new manufacturing facility, is in a position to further expand its brisk business activities in South Africa. There is strong international demand in the Energy and Environmental Technology division, thanks also to the general business revival. The Oksiluoto project proceeded successfully while, at the same time, the Group’s participation in the construction of new nuclear power plants is also becoming more likely. As a result of the financial crisis, the Mechanical and Plant Engineering division recorded a decrease in new orders in 2010; for 2011, a significant recovery within the context of the general economic upswing is to be expected.

Utilization of capacity
Overall, the developments described for all divisions resulted in a good utilization of capacities in 2010 for the Group. In the future, it will be both possible and necessary to apply the full scope of personnel resources at Power Services to the continued flow of large orders. Insofar as we faced disruptions or postponements in power plant projects, particularly as a result of political uncertainty in Germany, it was possible to shift employees to other orders in the Group’s broad portfolio or to employ them on jobs in other countries.

Investments
Investments in 2010 of approximately € 37 million were well above the previous year figure. This development can also be attributed to the acquisition and integration of MCE Berlin (MCE B), MCE Maschinen- und Apparatebau (MCE MAP) and MCE Aschelsen (MCE Asl). Investment volumes should now return to a level of about € 20 million for usual replacement and business investments, also because the major investment in the manufacturing facility in Pretoria was completed in 2010. In 2011, it was once again possible to fully finance investments from our own cash flow, thus making us independent from the still hesitant lending policies in the wake of the global financial crisis.

Training and personnel development
As was the case in 2009, the good business development and order situation in 2010 also meant that the workforce was selectively and with a sense of proportion increased. Overall, our primary goal remains that vacant positions in the Group are filled from within the company. For this reason, Power Services continues to consistently train young talent and in the past year hired 163 new apprentices. That is about 22 % more than in the previous year. Training and development also remains a core theme in our human resources policy in order to better qualify employees at all levels of the Company for the changing requirements our business presents. For the Group-wide strategic personnel planning, a new human resources staff position was created on the level of the Holding.

Expected development of the Company
Bilfinger Berger Power Services remains on a growth course, although organic growth in the market is facing limits set by ever-increasing competition. Political decisions in relation to power plant construction in Germany also continue to have a negative impact on potential growth. But nevertheless, even in a worsening economic situation, the demand for cleaner, safer energy remained lively; in an economy that is recovering, much stronger growth can be expected. Therefore, the Group is again looking at the year 2011 and beyond with optimism. Through consistent care for the competencies and structures, through targeted investments in healthy markets and strategic acquisitions, Bilfinger Berger Power Services will continue on its path of success.

Gerd Lesser
Chief Executive Officer
Ronald Diehl
Managing Director
Alexander Neubauer
Managing Director
Human Resources

»In our Company, the competence of each individual employee counts. The focus of our joint efforts is the success of the entire team.«
Our greatest asset: employees
Joint personnel policy of the Group

In 2010, the number of employees in the Power Services Group of companies was nearly stable. This reflected the principle of a sustainable corporate development and a healthy, moderate rate of growth, also in terms of the Group’s personnel policy: in addition to a cautious approach to expansion in employee numbers through new hires and systematic integration of qualified service and assembly specialists, project and construction managers as well as other specialists and managers, the focus is on the consistent training of our core staff and, primarily, the education of young employees. The decisive importance of strategic personnel work was recognized by the Group of companies in 2010 with the establishment of a new Human Resources corporate department.

More than 2,000 engineers
The increasing focus of our Group of companies on services in no way means that we are dealing with activities that could be managed by personnel with relatively limited qualifications. On the contrary: among our approximately 7,200 employees there is a large number of highly qualified technicians and specialists. More than 2,000 engineers make up the core competence of Power Services. In the competence of all employees, in their knowledge about the customers, in their reliability and the high quality of the work they do lies our competitive advantage. To care for this treasure trove of personnel is therefore a key task.

Personal responsibility and opportunity for promotion
The companies of the Group offer and attractive and dynamic working environment characterized by an entrepreneurial approach and with promising future prospects. The work brings with it a high degree of personal responsibility, team spirit, a diverse range of promotion opportunities and a fair working climate. For this reason, in Group companies, the loyalty of qualified employees is above average, while fluctuation is low. And, for the same reasons, companies are increasingly attractive for highly qualified applicants from all trades.

Diverse opportunities for career entry
Ongoing investment in the expansion and development of our personnel with the aim of utilizing the full potential and extending our “human resources” is at the very core of our personnel policy. This includes the training of young people in a wide variety of professional positions and within the scope of dual study programs, whereby the companies, with a full range of measures, can show interested young people the outstanding career prospects that are available; these measures range from company visits for students through to internships and getting to know the work more intensively as a working student. Power Services companies maintain intensive cooperations with a number of universities. For graduates, there are a diverse range of trainee programs which allow junior employees to get to know their new company, the various fields of work, the specific corporate culture and their future colleagues.

163 new apprentices at Bilfinger Berger Power Services
The Company continues to see the training of young people as a social obligation. And, beyond that, there is still a need for more young, motivated and well-educated employees. Therefore, in financial year 2010, 163 new apprentices were hired – 22 more than in the previous year (133). At the end of 2010, the total number of apprentices was 163 – also significantly higher than in 2009 (200). Of that total, 78 apprentices are working in the boiler and piping manufacturing facility in Pretoria, South Africa.

Getting good grades again
The content of the training is constantly being adjusted. Particularly in the welder training and in the practice-oriented specialist training at the manufacturing centers, the requirements go well beyond the framework plans set out by the German Chamber of Commerce. The good final grades at the Chamber of Commerce examinations have repeatedly confirmed the quality of training in the Group. In order to meet market demands, companies offer training courses that are always up to date. An increasing amount of attention is being paid to social competence, because confidently dealing with customers and colleagues is an important success factor.

A lifetime of learning: promoting education
As was the case in years before, it remains our primary goal to fill new and vacant positions with employees from within the company. For all employees, both new and experienced, a wide range of training programs are offered which follow the principle of a lifetime of learning, for the good of both one’s own personal advancement as well as for the improved performance of the company. The targeted support of employees is served by local and Group-wide personnel development programs and the provision of objective-oriented training and development measures. Deployment to international projects and business activities also serves to promote training and the positive identification many employees have with their company and Power Services.

Performance and commitment pay off
Good internal development opportunities make a decisive contribution to the motivation of the workforce, talented and committed employees at all levels can count on the fact that their performance will not go unrecognized. The internal transfer of improvements, best practices and standards, particularly in the area of construction and project management, encourages motivation, team building and identification with the Company. This practice is made transparent through a diverse range of measures in internal communication. Last but not least, an exemplary health care management and the consistent consideration of occupational safety contribute to the positive working climate.

Networks across borders
A particular challenge for personnel policy in a decentrally organized, market leading project and services company such as Bilfinger Berger Power Services lies especially in finding the right balance between a centralized and a decentralized approach with a view to the requirements of the business. This is among the many tasks of the new Human Resources corporate department at the Holding. Group-wide networking helps the Group in the context of its further internationalization to achieve a strong, comprehensive cultural identity.

The training program at the Group includes the following job descriptions:
- Bachelor of Engineering (cooperative engineering education)
- Business Administration (FH), (VWA) with parallel training as industrial clerk
- Industrial clerk
- Office communications clerk
- Technical draftsman
- IT specialist with focus on systems technology
- Plant mechanic
- Industrial mechanic
- Construction mechanic (with focus on welding technology)
- Mechatronics technician
Overview: the four divisions at Bilfinger Berger Power Services

Steam Generators
In the Steam Generators division, Power Services has a powerful group of companies at its disposal with Babcock Borsig Service, Steinmüller Instandsetzung Kraftwerke, Deutsche Babcock Middle East, Duro Dakovic Montaza, Rotring Engineering and Bilfinger Berger Power Holdings. The range of services spans the planning, manufacturing and installation of new steam generating facilities, the repair of individual components and the revision of overall design and conversions. The group provides every service for the optimization of steam generators using various types of fuel. The result: increasing economic efficiency and availability, longer useful life, meeting legal regulations and the reduction of CO₂ emissions. Our steam experts support facilities over their entire life cycle. Part of the components come from in-house production. The delivery of replacement parts is guaranteed. From engineering to commissioning, everything comes from a single source!

Babcock Borsig Service GmbH
Manufacturing locations: Oberhausen, St. Ingbert, Chamburi
Steinmüller-Instandsetzung Kraftwerke GmbH
Manufacturing location: Peitz
Deutsche Babcock Middle East FZE
Duro Dakovic Montaza d.d.
Rotring Engineering AG
Bilfinger Berger Power Holdings (Pty) Ltd.
Manufacturing location: Pretoria, Aroide

Energy and Environmental Technology
Within the Energy and Environmental Technology division, Babcock Noell GmbH offers services in the product areas of environmental, magnet and nuclear technology as well as nuclear service. Whether it’s flue gas purification in power plants, superconducting magnets for research facilities or containment liners for nuclear power plants – when it comes to technical solutions for highly complex facilities, BNG is equally well-regarded by architects, planners and operators. Many decades of experience and close cooperation with globally recognized producers count among Babcock Noell’s qualifications. For the construction of nuclear power plants, BNG supplies components for the building and machine technology, personnel and material locks, containment liners and pool lining, among other things. In the area of magnet technology, Babcock Noell develops superconducting magnet systems for high energy physics and nuclear fusion. Our engineers have been planning and building flue gas purification systems for conventional power plants since the mid 1980s. Furthermore, BNG supplies efficient systems for flue gas purification for smaller combustion facilities as well.

Babcock Noell GmbH
Manufacturing location: Würzburg

Piping Technology
With BHR Hochdruck-Rohrleitungsbau, the South African BHR Piping Systems and MCE Berlin, Power Services includes three high performing companies that together cover the entire range of piping technology. Their range of services includes, in addition to high, medium and low pressure piping systems for power plants, the provision of industrial piping as well as facility construction and installation. They have particular competence in the processing of special materials, which are permanently under constant development for use in efficient, modern power plants under a high thermal load. When it comes to piping that must conform to the highest of demands, the international specialists at Bilfinger Berger Power Services are the number one choice. The Company stands out with decades of experience in engineering, prefabrication and installation. That applies to conventional, renewable and nuclear power plants as well as for facilities in the chemical and petrochemical industry and for steel and metallurgical plants. Since opening the plant in Pretoria in 2010, BHR Piping Systems has taken care of the African market with the knowledge transfer from BHR.

BHR Hochdruck-Rohrleitungsbau GmbH
Manufacturing locations: Dortmund, Essen, Osterode
BHR Piping Systems (Pty) Ltd.
MCE Berlin GmbH

Mechanical Apparatus and Plant Engineering
The Mechanical Apparatus and Plant Engineering division of Bilfinger Berger Power Services is represented by the companies MCE Maschinen- und Apparatebau GmbH, MCE Maschinen- und Apparatebau GmbH & Co. KG and MCE Aschersleben GmbH. Their special knowledge lies in the combination of technical welding and mechanical processes as well as in the installation of large, heavy and complex steel components. Their range of services includes the delivery of construction components for water, gas and steam turbines and for aviation and space travel as well as large equipment and reactors for the chemical industry, pressure pipes, welded constructions, special machines and spare parts. Since the beginning of 2010, both businesses have been part of the strong Power Services Group of companies and have expanded the Group’s portfolio with their competence in manufacturing machines and equipment. The companies’ experts are involved in many challenging projects across Europe. Their references include massive reactor containers for the chemical industry, core containers in many nuclear power plants, turbine blades, tank covers for the Ariane V rocket or towers for offshore wind turbines.

BHR Hochdruck-Rohrleitungsbau GmbH
Manufacturing locations: Linz
MCE Maschinen- und Apparatebau GmbH
Manufacturing location: Aschersleben
MCE Maschinen- und Apparatebau GmbH & Co. KG
MCE Aschersleben GmbH
Steam Generators

"Our engineers, our highly qualified employees in manufacturing and our experienced installation teams — together they all guarantee the customer the highest level of quality."
Steam moves the world, and efficient resources such as environmentally-friendly steam generation in power plants is a key technology of our time. Several companies in the Power Services Group are active and successful in this division with competence and experience: Babcock Borsig Service, Steinmüller Instandsetzung Kraftwerke, Deutsche Babcock Middle East, Bilfinger Berger Power Holdings, Duro Darkovic Montaza and Rotring Engineering AG. They cooperate in a successful and international group of companies.

Economical, clean, reliable
Today, most people perceive energy in the form of electricity that is available everywhere. However, steam is the most common working fluid in power plants to run turbines and generators – regardless of which energy source was originally used to heat this steam. The expertise of the companies surrounding the topic of steam generators and generators – regardless of which energy source was originally used to heat this steam. The expertise of the companies surrounding the topic of steam generators and their components guarantees proper installation and the highest quality while meeting precise deadlines to the hour. Decades of experience in Europe, the Persian Gulf and southern Africa has made the boiler experts at the Group worldwide into sought after partners.

Our engineers find the solutions
Approximately 5,000 engineers worldwide work for the Power Services Group in this area for customers in the energy sector as well as the production and processing industries. They include several hundred engineers, who are continually working on new, intelligent solutions for steam generation in power plant processes in order to meet the constantly rising demands of the field. The optimization of firing processes for increasing efficiency only represents one aspect of these demands here; effective flue gas purification that does not come at the cost of performance is just as important.

From engineering to maintenance
Bilfinger Berger Power Services designs, manufactures, delivers and installs all boiler components for construction, conversion or repair. Whether the aim is to increase the useful life of facilities, to increase their effectiveness or to reduce emissions: the companies of Power Services support power plants from engineering to maintenance over their complete life cycle. And it does not matter whether the plants use lignite, hard coal, oil, natural gas, nuclear power, biomass, solar energy or waste as their primary energy source.

Firing technology for all fuels
Firing technology lies at the core of steam generation, because efficiently controlled burning improves the effectiveness of a power plant and helps reduce CO₂ emissions. The Power Services companies have the firing technology solution for many fuels and every application: selection of fuel type, design and layout of the burners, controlling combustion air and waste gases. The companies help power plant operators achieve optimum burning with modern coal pulverizers and classifying devices, even with changed fuel qualities. After all, apart from using efficiency to reduce pollutants, the procedural purification of waste gases is also part of the product portfolio.

In-house production, competent installation
A large part of Power Services boiler components are produced in-house. In addition to innovative engineering, highly qualified specialists in Pretoria, Peitz, Oberhausen, St. Ingbert, Slavonski Brod and Sulingen ensure technical quality for the assembly of components. Furthermore, Power Services has the largest installation team in the field of power plant technology in Germany. As is the case for all the Company’s locations worldwide, this team delivers and installs all boiler components for construction, conversion or repair. Whether the aim is to increase the useful life of facilities, to increase their effectiveness or to reduce emissions: the companies of Power Services support power plants from engineering to maintenance over their complete life cycle. And it does not matter whether the plants use lignite, hard coal, oil, natural gas, nuclear power, biomass, solar energy or waste as their primary energy source.

Examining according to the dual control principle: furnace gas burner bending
Even under difficult conditions: evaluation of superheaters

Services:
- Construction, conversion, modernization and optimization of differently fueled, low-emission systems for solid, liquid or gaseous fuels
- Project planning, construction, planning
- Assessment of condition, inspection, analysis, solution concepts
- Preparation of studies for firing conversion
- Advice on firing problems
- Thermal and process engineering design and calculation of steam generators and their components
- Stability calculation, current simulation and special calculations
- Construction technology in consideration of the international regulations and standards
- Preparation and approval planning
- Manufacture, installation and commissioning

Products:
- Service, inspection, maintenance, review, repair
- Spare parts service
- Know-how of peripheral equipment, e.g. pulverizing and conveying plants, gas pressure reduction stations, fittings, valves, air and flue gas supply, electric and control technology
- Service for heavy equipment for opencast mining
- Pressure parts, canals, compensators and hatches
- Burners for gas, liquid and solid types of fuel
- Pulverizers and classifiers
- Coal feeding and ash removal systems
- Small power plants with co-generation of heat and power
- Desalination plants
On-site competence:
Installation at the power plant site

Conversion to oil in Qurayyah, Saudi Arabia

The relatively recent subsidiary of DBME, Babcock Borsig Service Arabia (BBSA) in Saudi Arabia has won a large order. Now the company can once again prove its competence and punctuality in power plant renewals. Background: the Qurayyah power plant (2,600 MW) currently runs on natural gas. That which seems to have a promising future in other places counts as a disadvantage in Saudi Arabia: the country has only minimal natural gas resources, which are urgently needed by the petrochemical industry. Oil, on the other hand, is plentiful, so Qurayyah will now be converted to use light oil as its fuel. To that end BBSA will complete extensive modernization of the still-existing heating oil system by the beginning of 2013: the fuel supply system and processing, the soot blower system, the air preheaters and the cleaning system.

References from the Steam Generators division

SIX lignite firing reduces NOx in Matra, Hungary

The Matra power plant runs with lignite. As Hungary’s second biggest power plant (900 MW), it plays a decisive role in supplying the country’s energy. In order to reduce NOx emissions and increase the effectiveness and useful life of the wear parts, the modernization of the firing systems in two 220 MW blocks was offered up for tender. The order went to SIX. From August 2008 to October 2010, SIX modernized twelve firing systems—pulverisers, classifiers, dust piping, burners and air conveyance. Afterwards, the completely modernized boiler 5 was able to consistently meet the required NOx values—even when the coal was mixed with 5% biomass.

Hot air for more efficiency at SASOL, South Africa

Boiler 9 of the coal fired power plant Secunda of South African SASOL had a problem: operational and maintenance costs were extremely high. The solution consisted of the incorporation of a new preheater for the combustion air. The order went to a consortium of two Power Services companies: Steinmüller Engineering Services (South Africa) and BBS (Oberhausen). Twelve preheating modules were manufactured according to the specifications of BBS Engineering in Pretoria. Each weighed approximately 70 tons, making even the delivery a great challenge. Tasks in Secunda included removing the old preheater, reinforcing the existing structures for their successor and, finally, installing the enormous components of the new system with the help of heavy equipment.

BB5 transfers flue gas heat at Belchatow

At Europe’s largest lignite-fired power plant, Belchatow in Poland, BBS is equipping two blocks with their ECOGA VO flue gas heat transfer system, an efficient and elegant solution for an old problem: after running through most desulfurization units (FGDU), a power plant’s flue gases are too cool to be able to naturally and thermally mix with the surrounding air in the chimney. As a result, the gases have to be re-heated. The BBS ECOGA VO system transfers the necessary heat using modern heat exchangers and plastic tubes away from the hot flue gas before the FGDU and “shifts” it to the purified flue gas in the chimney. This allows the adherence to environmental regulations without the use of additional heating energy and the CO₂ stress results.
Energy and Environmental Technology

“We aim to constantly improve our products and services. To achieve this goal we work together with our customers and with researchers from numerous institutions.”
Clean energy for the future

Our engineers are partners for power plant operators and researchers

The engineers at the Energy and Environmental Technology division continuously deliver new, sustainable solutions for highly complex plants, starting with power plant flue gas purification through superconducting magnets for research facilities to containment structures for nuclear power plants. A broad range of knowledge and decades of experience in environmental technology, magnet technology, nuclear technology and nuclear service make our experts sought-after partners for operators of power plants and large-scale research facilities. The services range from the development, design, delivery and commissioning through to the operation of delivered plants. With 260 engineers and 60 highly qualified installation technicians, Babcock Noell GmbH (BNG) is the competence center for this sector within the Bilfinger Berger Power Services Group.

Innovative and reliable flue gas purification technology

Our engineers have been designing and constructing flue gas purification systems for conventional power plants since the mid 80s. BNG’s Environmental Technology delivers complete flue gas desulfurization units in line with the latest technological standards. Since 2005, the innovative tray technology of the global US power plant builder B & W has also been employed. BNG’s service range includes complete plants with the necessary components such as absorbers, containers, untreated gas and clean gas ducts, piping, pumps and E/I&C technology. In the area of new plants, BNG realized two major projects in 2010: the flue gas desulfurization units for Vattenfall Europe AG’s Boxberg and Moorburg power plants. Babcock Noell is also realizing challenging orders in the area of catalytic flue gas denitrisation (DENOx), with the company for example having now received the award for the delivery of eight catalytic denitrisation plants to Israel. Customers also benefit from the technology leader’s expertise in the modernization and efficiency improvement of existing plants. In addition, the company also delivers efficient, economical and low-maintenance waste gas purification units for production plants.

State-of-the-art magnet technology

In the area of magnet technology, Babcock Noell develops large superconducting magnets for high-energy physics and nuclear fusion. The most impressive references are the orders for the series magnets for the fusion experiment Wendelstein 7-X and the LHC particle accelerator in the CERN research center, Geneva. BNG currently designs and manufactures magnets, coils, undulators and spectrometers for many international research projects. For such projects, Power services specialists also take on individual development tasks. They have particular expertise in the use of super conductors, which considerably increase the performance of conventional magnetic systems.

Nuclear technology equipped for the future

BNG has extensive knowledge in the area of nuclear technology earned from more than 40 years of experience in the area. This product division is therefore ideally equipped for future challenges, in the new construction or shutdown of nuclear power plants as well as in the conditioning and storage of radioactive waste. Products delivered include components for building and machine technology, person and material locks, containment structures and tank linings. Outstanding and technically logically demanding projects such as the delivery of the containment liner and other complex components for the new Olkiluoto 3 nuclear power plant in Finland provided further evidence of BNG’s expertise in 2010. BNG also carried out successful work in 2010 at the new French nuclear power plant in Flamanville and the ICEDA waste treatment plant of Electricité de France. For the Chinese power plant Taishan 1/2, which has the same modern EPR™ model as Olkiluoto 3 and Flamanville, BNG delivers the filter changing equipment in the melt plug and diverse components for waste treatment. Overall, a large market is emerging for BNG in the market for modern nuclear power plants.

Close to the customer: our service team

The Nuclear Service area is a reliable service and installation partner for operators of nuclear plants. A dedicated team of around 60 experienced service and installation technicians make up the backbone of this team. Among the specialist machinists in the workshops and employees for system and container pressure tests with extensive plant experience are available for challenging tasks in nuclear power plants and nuclear facilities. This team is the basis for the continuously growing service volume. Customer proximity, quality and adherence to schedules, combined with innovative solutions, has made Babcock Noell a reliable partner for many customers for decades.

Services and products

The division is active in the development and design through delivery and commissioning to operation of the delivered systems and facilities on behalf of power plant and facilities operators as well as research institutions, in the following areas:

Environmental technology
- Flue gas desulfurization units
- Denitrification plants
- Inspections, conversion, optimization

Magnet technology
- Special magnets for fusion facilities
- Super conducting magnets for particle accelerators
- Coils, undulators and spectrometers

Nuclear technology
- Systems and components for nuclear power plants
- Maintenance and modernization
- Conditioning of radioactive waste
- Shutdown and demolition of nuclear facilities

Nuclear service
- Maintenance, services including pressure tests
- Installation
- Operation and maintenance of crane systems and replacement machines
Our coils tame the fire of the sun
Nuclear fusion is a central technology for our future supply of safe and clean energy. At the Wendelstein 7-X fusion research facility at the Max Planck Institute for Plasma Physics in Greifswald, scientists and engineers will produce a plasma starting from 2014, which will allow the nuclear fusion process to be studied.

Under the leadership of BNG, a consortium manufactured the 50 non-planar field coils for Wendelstein 7-X. These coils, which surround the fusion plasma, are super conducting and therefore need to be operated at minus 269°C. This places special requirements on design, construction and manufacture. In addition, the coils also have varying and complex forms. This and the sheer size of the coils made their manufacture one of the most challenging major projects in the area of magnet technology. The project was successfully completed in April 2010.

Melt plug with transport system

Safety for the new EPR™ nuclear reactor model
The EPR™ is a state-of-the-art pressurized water reactor developed jointly by Areva, EDF and Siemens. In addition to the Finnish reactors at the Olkiluoto nuclear power plant, such reactors are also currently being constructed in Flamanville, France and Taishan, China. The safety systems of this model include a core meltdown stabilization system which limits the consequences of a hypothetical accident. Part of this system is the 15-ton melt plug with transport system that BNG designed and manufactured for Finland, Flamanville and Taishan. The melt plug, which is removable for maintenance purposes, is fixed during operation with lock bolts to the bearing frame positioned under the reactor. During inspections, the plug is released by the remote-control transport system, lowered with the carriage and transported through the tunnel into the melt catch basin.

Our EPR™ plant is now in the construction phase: Babcock Noell desulphurizes Hamburg’s Moorburg power plant
The new Hamburg Moorburg coal-fired power plant is currently in the installation phase. It consists of two blocks, each with 820 MW electrical output. BNG was awarded the order from the operator Vattenfall Europe AG for the design, delivery, installation and commissioning of the complete flue gas desulfurization plant including the gypsum dewatering and the clean gas flue. In the two powerful wet scrubbers, the flue gas will be washed with a suspension of ground limestone and water after pre-deducting. 4.6 million Nm³ per hour of untreated gas with a sulfur dioxide content of 4,000 mg/Nm³ will be desulfurized in this way to a clean gas content of 100 mg/Nm³. In other words: our modern flue gas desulfurization technology will reduce the sulfur content of the waste gases by at least 97.5%. Approximately 50 t of gypsum per hour will be produced as a by-product, which is a sought-after construction material. The plant is expected to be commissioned at the end of 2011.

Babcock Noell desulphurizes Hamburg’s Moorburg power plant

Babcock Noell desulphurizes Hamburg’s Moorburg power plant

Facts and figures from the Energy and Environmental Technology division:
- Around 350 people were employed in the Energy and Environmental Technology division in 2010.
- Output volume in this division amounted to around € 76 million in 2010.
- Headquarters of the company: Würzburg.
"Whether in Germany, Europe, the Middle East or South Africa – our companies work all over the world in accordance with our shared, binding quality standards."
The continuously growing demand for piping made of heat and pressure requires special pipes which must withstand high temperatures and pressures. Expertise in the processing of the most modern materials inspections. In particular, they have specialist technical correct installation and meet deadlines to the hour for plant techniques. Highly qualified installation teams guarantee for the most important and most innovative welding treatment systems and automatic welding machines. These include three induction bending machines, heat manufactured in our plants using the latest production facilities. Piping systems, pipe fittings and instruments are manufactured in these companies worldwide are committed to the entire range of piping technology. Over 1,600 employees in these companies worldwide are committed to the continuing success of the division.

The team is familiar with the most modern materials. Piping systems, pipe fittings and instruments are manufactured in our plants using the latest production facilities. These include three induction bending machines, heat treatment systems and automatic welding machines for the most important and most innovative welding techniques. Highly qualified installation teams guarantee correct installation and meet deadlines to the hour for plant inspections. In particular, they have specialist technical expertise in the processing of the most modern materials which must withstand high temperatures and pressures.

Heat and pressure require special pipes. The continuously growing demand for piping made of such materials is due to two trends: Firstly, power plants are expected to be more economical in their use of fuels in order to conserve natural resources. Secondly, plants are required to reduce their emissions of hazardous substances as much as possible. The key to more conservation is efficiency. Increased efficiency also contributes substantially to reducing waste gases. This is no different for power plants than it is for cars. Improved efficiency in the power plant process can be achieved via higher temperatures and higher pressures. These can only be withstood by special materials, which the Power Services piping specialists are playing a key role in developing and in whose manufacture and processing they specialize. For example, pipes with walls up to 12 cm thick are bent with millimeter precision by high-performance large-scale induction pipe bending machines. Manufacturing and installation master all welding processes and techniques that are necessary for the processing of such special pipes.

Innovations help to reduce emissions worldwide. As the leading supplier of such high-resistance piping systems, BHR is playing a major part in the renewal of power plants worldwide – and thus in a considerable reduction of harmful emissions. This leading position of the Group has been further strengthened since 2010 by the new BHR Piping Systems manufacturing facility in South Africa. The piping constructors of the Power Services is thus prepared for all orders as part of the extensive South African power plant renewal and can also expand their leading role on the entire African continent.

Clean solution for nuclear plants Nuclear plants also place the highest requirements on the manufacture of piping systems. Such requirements are met, for example, by BHR’s dedicated clean hall in Dortmund where exclusively high quality, alloyed (austenitic) materials are processed and strictly separated from other types of steel processed in the building. This applies for example to the piping being delivered to Olkiluoto 3 in Finland, the largest nuclear power plant in the world.

Proven quality from a single source In addition to the power plant business, BHR and MCE Berlin, as piping specialists, are also required in the chemical and petrochemical industries, in steel and smelting works, by paper, wood, pharmaceutical and food manufacturers as well as by gas, water and district heating suppliers. Customers worldwide know: The Power Services Group specialists provide everything from engineering through manufacture to installation and subsequent services from a single source. On time, and always with the same high quality. This principle often applies beyond the actual division as the piping constructors on many construction sites all over the world cooperate daily with colleagues from other companies of the Bilfinger Berger Power Services Group.

Insight: Pipelines in the Neurath boil 2/3 power plant

Perspective: Visual inspection of the interior surface of BHR’s Dortmund plant

A great team and robust technology

Our piping technology experts are in demand all over the world

The Piping Technology division is the European market leader for the new construction and maintenance of water-steam cycles in power plants. This Power Services division is distinguished by decades of experience in engineering and in the prefabrication and installation of piping systems. This applies to conventional, renewable and nuclear power plants, as well as for industrial plants. Part of Power Services are three high-performing companies, BHR Hochdruck-Rohrleitungsbau, MCE Berlin and the South African BHR Piping Systems, which together cover the entire range of piping technology. Over 1,600 employees in these companies worldwide are committed to the continuing success of the division.

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Work at Moorburg power plant construction site progresses day and night

A lot revolves around Olkiluoto 3 in Finland

“Core competence” for Olkiluoto 3 in Finland

Progress all according to plan in Moorburg power plant

In Moorburg, south of Hamburg, Vattenfall Europe AG will complete construction by 2012 of an ultramodern and efficient coal-fired power plant to replace older facilities. BHR was awarded the contract to design, deliver and prefabricate the high pressure systems for the two power plant blocks, each with an output of 820 MW. The installation and commissioning of the high pressure pipelines was also part of this order. After setting up the construction site, installation at block A began on schedule on April 30, 2010. In the course of the following weeks, the first 250 tons of fixtures and spools were installed in the hot and cold intermediate superheating systems in the boiler house. In the meantime, the team at block B began the installation of the first spools for the feedwater and cold intermediate superheating systems. Around 55 BHR employees are constantly present on the construction site, all work is progressing according to plan.

References from the Piping Technology division

New plant in South Africa well utilized
In April 2010, BHR Piping Systems (Pty) Ltd. opened its new prefabrication plant in Pretoria. Its centerpiece is a large-scale induction bending machine. The manufacturing facility which is unique in Africa is specialized in bending, annealing and spooling high-pressure piping systems for the South African market, while meeting the state requirements for the award of the “Made in South Africa” stamp. A prefabrication order for the new Medupi und Kusile power plants made a significant contribution toward the immediate capacity utilization of the plant – in total twelve coal-fired blocks, each with 800 MW. The order includes high-pressure piping, boiler-internal piping and 37 pipe fittings. The prefabrication of the piping spool was divided between the plants in Pretoria and Dortmund. Work on the first block – Medupi 6 – was successfully completed at the end of 2010.

Facts, figures and operating companies in the Piping Technology division:

- Around 1,600 people were employed in the Piping Technology division in 2010.
- The output of the division amounted to € 456 million.
- Headquarters of the companies involved: Essen (BHR), Berlin (MCE Berlin), Pretoria (BHR Piping Systems).
»Newly added companies are carefully integrated. We recognize our diverse roots and form a dynamic group of companies with shared values.«

Mechanical Apparatus and Plant Engineering
From hydroelectric power to space travel

Mechanical Apparatus and Plant Engineering division spans wide service range

The list of references ranges from turbine blades for hydroelectric power plants and components for water, gas and steam turbines through containers for nuclear power plants and massive reactor containers for the chemical industry to tank covers for the Ariane V rocket. Also supplied are pressure pipelines, welded constructions, special machines and spare parts. The extensive range of the Mechanical Apparatus and Plant Engineering division of Bilfinger Berger Power Services is provided by the companies MCE Maschinen- und Apparatebau in Linz, Austria (MCE MAP) and MCE Aschersleben (MCE Asl).

Manufacturing and installation under one roof

The core competence of MCE Maschinen- und Apparatebau in Linz, Austria, lies in the manufacture of demanding and complex components for gas, hydropower and steam power plants as well as in the engineering and production of large-scale, heavy equipment, containers and reactors for apparatus and plant engineering. In addition, the company specializes in the manufacture of pressure pipelines for hydroelectric power plants. Components for the aerospace sector and general mechanical and plant engineering complete the corporate division’s product range. The manufacturing location in Linz combines apparatus engineering, mechanical manufacturing and installation under one roof and enables short lead times. Since 2010, the company has had its own clean hall, which meets the special cleanliness standards required for nuclear power plant components. MCE Aschersleben is a specialist company which focuses on the manufacture of structural steel pipes, dolphins, pressure vessels and apparatus, welded pipe fittings, spool manufacture, offshore foundations and special constructions.

Individual single and series small batch production

Demanding welding techniques and the ability to mechanically process large workpieces with high precision ensures the position of the corporate division as a competent and reliable partner for its customers. As a specialist in single and series small batch production for small and large-scale workpieces, MCE is equipped to fulfill even exceptional requirements on time and at the highest quality. Apparatus engineering, installation and repairs complete the service range. Extensive experience and a comprehensive range of equipment enable individual productions to be produced with speed and precision.

Specialists for water power

One specialty of MCE Maschinen- und Apparatebau is the manufacture of highly developed rotors and control systems for water turbines, particularly those for medium-sized and large-scale plants. MCE MAP manufactures the three most important types of turbine used in hydropower plants: pelton, francis and Kaplan turbines. Added to these are specially-designed models such as propeller or matrix turbine rotors. Pelton turbines use the high pressure gradient of storage power plants in mountains to cover peak load. The record is held by the Cleuson-Doxence power plant with a fall of just under 3,000 meters. At the outlet nozzles, the water relaxes from 200 bar to atmospheric pressure. At the same time, it experiences tremendous acceleration, hits the turbine buckets at 500 km/h and turns the turbine rotor and the generator at 3,000 rotations per minute. It’s obvious that only precisely manufactured components will be able to withstand this type of pressure.

Turbines from Linz around the world

Francis turbines are used for medium-height falls. They are the all-rounders among water power turbines. Designed as reversible pump turbines, this type of turbine, in the case of an oversupply of power, can pump water back into the reservoir for use in later peak demand periods. Kaplan turbines and kaplan tubular turbines are used as workhorses in run-of-river power plants to cover base load. They are highly efficient at processing large amounts of water with low fall heights. All the Danube power plants in Austria are equipped with this type of turbine. MCE MAP supplies rotors of all types to Andritz Hydro GmbH. Distributed around the world, they carry out their tasks in hydroelectric power plants. Every year, after several months of machining work, the Linz manufacturing facility produces two large pelton rotors, eight to ten francis and one to two kaplan rotors.

Fields of activity:

| Mechanical processing of components for |
| Gas and steam turbines |
| Water turbines |
| Aerospace |
| Nuclear technology |
| General mechanical engineering |

Services for apparatus and plant engineering:

| Manufacture of apparatus, heat exchangers, containers and reactors for the process industry including design, calculation and detail engineering |
| Welded turbine housing |
| Rotors for hydroelectric power plants |
| Pressure pipelines |
| Hydraulic steel construction |
| Manufacture of components in a certified clean room for the nuclear sector |
| Welded constructions |

Plant installation work:

| Complete installation of metallurgical plant machines, special machines and components for nuclear power plants |
| Overhaul of steam turbines |
| Production monitoring |
References from the Mechanical Apparatus and Plant Engineering division

Proven partnership leads to new orders
With two low pressure inner housings as well as other heavy, welded and processed structural steel components, MCE MAP was involved in the construction of the world’s largest steam turbine. Siemens Power Generation pre-assembled the device designed for 1,600 MW(e) in Mülheim and delivered it to Finland to the new nuclear power plant Olkiluoto 3. The work carried out by MCE MAP was recognized with the Supplier Award and led to similarly challenging subsequent orders. For the Sendai nuclear power plant in Japan, whose turbines were replaced, MCE MAP again delivered large welded and mechanically processed inner housings. Further proof of the trust placed in the expertise of the Mechanical Apparatus and Plant Engineering division was the order from the VA Foundry, Linz, for the mechanical processing of the high-pressure turbine housing for the Flamanville nuclear power plant in France.

Success via quality and adherence to schedules
Through quality, adherence to schedules and continuously working together with the customer to further develop the product, MCE MAP has become a main supplier of exhaust manifolds and outlet manifolds for LURGI, the Frankfurt-based plant constructor. More than 20 of these projects have been carried out since 1999. For example, such an outlet manifold was completed for a hydrogen plant in Rotterdam after a construction period of only eleven months. For the pipe conduits of the complex system, 126 tons of high-temperature resistant boiler steel as well as six tons of nickel-chromium sheet was installed and 92 tons of refractory concrete was placed in the pipes and dried at approx. 250°C. Around 150 running meters of manifold pipes, divided into 16 shipping units for delivery, and two section crossheaders 10.8 and 10.6 meters in length were test-installed in the workshop on schedule.

Auditing convinces new customers
After intensive auditing, the Danish catalyst specialist Haldor Topsoe A/S awarded its first contract to MCE MAP. The contract relates to engineering, production work and delivery of a waste heat boiler for Petrochemia in Poland. This device, with a weight of 50 tons, is a heat exchanger in which process gas with an inlet temperature of more than 1,300°C is cooled to a constant outlet temperature of below 500°C. The high-pressure steam generated during this process is fed into an overhead steam drum. Welding the heat exchanger tubes together at the back of the tube plate is a particular challenge when manufacturing the tube bundle. In order to ensure the 100% welding quality required, a special technique was developed, with which parameters determined on a test piece can be read into a computer program to control the automatic welding machine.

Complex coke gas precooler demonstrates expertise
With the engineering, manufacture and installation of a coke gas precooler for Dillinger metallurgical works in Saarland, Germany, MCE MAP once again demonstrated its expertise in the production of large-scale, heavy and complex apparatus. The inner workings with 10,400 obliquely running pipes and two media circuits working independently of each other make this type of coke gas precooler particularly effective. The structure with a total weight of 250 tons is made up of profiles and thin-walled sheet metal, which is unusual for mechanical and apparatus engineering. With the large amount of welding work, the utmost attention had to be paid to the welding sequence, precision and heat input. The installation of the precooler as well as the rolling in of approximately 8,000 pipes was also included in the contract. Subsequent pressure and leak tests were immediately successful with no further steps necessary.

Facts, figures and operating companies in the Mechanical Apparatus and Plant Engineering division:
- A total of 400 people were employed in the Mechanical Apparatus and Plant Engineering division in 2010.
- The output of the division amounted to €50 million.
- Headquarters of the companies involved Linz, Austria (MCE MAP), Aischereiden, Germany (MCE Ais).
Innovation & sustainability

»Like our partners in industry and research, we are committed to a shared responsibility for a sustainable energy supply and a clean environment.«
Progress all round: orbital welding technology

The principle: split-second welding of pipes

Micro power plant generates electricity and heat

In the coming years, there will be high demand for plants that are capable of decentralized and combined generation of electricity and heat – known as “combined heat and power (CHP) plants”. This combination is cost-effective and environmentally friendly. Using their experience in conventional power plant construction, BBS is developing such a plant for medium-sized companies, hospitals and customers of a similar size. The “micro power plant with micro gas turbine”, called PowerBlock, can work with different gas-based fuels. The electricity generated is fed directly into the electricity grid. The water heated in the exhaust gas heat exchanger is transferred to the heating and hot water system of the local building. The operating data is evaluated via an online connection, thus supporting reliable, fault-free operation and providing guidelines for cost-effective maintenance. The first trial operation of such a plant started in 2010 in BHR’s Dortmund plant.

First large-scale power plant converted to biomass

Engineers and installation technicians from BBS carried out pioneering work at Rodenhuize, Belgium: for the operator Electrabel, they converted a 560 MW coal-fired power plant to run on biomass. In the future, the plant will be fired on wood dust, thus producing CO₂-neutral power. This has never before been achieved by a power plant of this size. In addition, the new burners can also burn furnace gas from the neighboring steelworks in parallel, and the boiler can still alternatively be fired with natural gas – such flexibility was a particular challenge for the process engineering. Through close cooperation of all disciplines, the BBS experts made the conversion possible and opened the door to a new market. Because energy generation from biomass is a technology of the future and it becomes even more attractive for operators if, as in Rodenhuize, power plants can be converted for other fuels at any time.

New technique for explosive welding

Power plant turbines use feedwater pre-heating systems. Until now, the construction and regular repair of heat exchangers involved welding the pipe connection, a labor-intensive and time-consuming task. The BBRPH team introduced explosive welding as a new time-saving technique. This technique involves the welder laying an explosive charge in the tube sheet, the detonation welds on the pipe in seconds. It is no longer necessary to x-ray the join. Because the tubes expand, however, the technique restricts the design of new tube bundles in relation to distance and size. The developers from Steinmüller Africa are now working on a preheater design tailored to the new welding technique. The company can use this design to not only work on boilers but also on other preheaters, thereby contributing toward increasing the overall efficiency of power plants.

Innovation in all divisions

Orbital welding for power plants of the future

Orbital welding is not a space technology but a process in which a welding head automatically rotates axially around the pipe. For a long time, this was considered uneconomical and hardly feasible under installation conditions compared to manual welding for most applications. But through persistent further development, BHR made the process suitable for the construction site and since then has been successfully using WIG orbital narrow gap welding technology in the new construction of conventional power plants such as in in Neurath and Boxberg. It also works with pipe wall thicknesses considerably larger than 90 mm. This development leap is of particular, trendsetting importance right now, as it makes the processing of nickel base materials for the modern, more efficient, next-generation 700°C power plants economical with reproducible high quality and absolute precision.
The main companies* of Bilfinger Berger Power Services

**Babcock Borsig Service GmbH**
... is one of the leading suppliers of products and services for the energy production industry. Its activities focus on the areas of engineering, efficiency improvement, power plant service and project management.

- **Output volume in € million:** 2008: 161, 2009: 228, 2010: 188
- **Employees:** 2008: 592, 2009: 595, 2010: 602
- **Managing Directors:** Bernhard Köthgasser, Andreas Miehle

**Steinmüller Instandsetzung Kraftwerke Gesellschaft für Energie- und Umwelttechnik mbH**
... provides comprehensive engineering and other services to power plants:from design, manufacture, delivery and installation through to maintenance, repair and inspection.

- **Output volume in € million:** 2008: 105, 2009: 146, 2010: 129
- **Employees:** 2008: 407, 2009: 426, 2010: 430
- **Managing Director:** Manfred Rösner

**Deutsche Babcock Middle East FZE**
... is one of the leading companies in the Gulf region in the areas of industrial construction, power plants, steel works as well as renovation, expansion, maintenance and operating services.

- **Employees:** 2008: 785, 2009: 1,923, 2010: 1,120
- **Managing Directors:** Dr. Thomas Suckut (Chairman), Clemens Wolters, Peer Maluck

**Duro Dakovic Montaza d.d.**
... with headquarters in Slavonski Brod (Croatia), the company is a globally active installation provider for power plants and petrochemical and industrial facilities.

- **Employees:** 2008: --, 2009: --, 2010: 1,028, 1,001
- **Managing Directors:** Drago Cugura (Chairman), Stjepan Sveric, Darko Katic

**Rotting Engineering AG**
... with headquarters in Buxtehude (near Hamburg), is a globally active, leading provider of process technology in power plants for fuel processing for oil and gas-fired turbines. Rotting takes responsibility for customer-specific engineering and purchasing of components as well as delivery and commissioning.

- **Output volume in € million:** 2008: 96, 2009: 140, 2010: 165
- **Employees:** 2008: 821, 2009: 1,449, 2010: 1,104
- **Managing Director:** Rainer Chamier

**Steinmüller Energy & Environment**
... is one of the leading suppliers of products and services for the energy and environmental sector. Its particular competence lies in the processing of materials for efficient, modern power plants, subject to high thermal loads.

- **Employees:** 2008: 284, 2009: 315, 2010: 328
- **Managing Directors:** Dr. Ronald Hepper, Peter Stephan, Helmut Welp

**Babcock Noell GmbH**
... operates worldwide in the product areas of environmental technology, magnet technology, nuclear technology and nuclear service. The services range from the development, design, delivery and commissioning through to the operation of delivered plants.

- **Managing Directors:** Mario Peper (Chairman), Jürgen Weyers**, Thomas Appel, Günter Rychlik**

**BHR Hochdruck-Rohrleitungsbau GmbH**
... is the European market leader for the construction of high-pressure pipelines for water-steam cycles in power plants. Its particular competence lies in the forming of materials for efficient, modern power plants, subject to high thermal loads.

- **Employees:** 2008: --, 2009: --, 2010: 168
- **Managing Directors:** Günter Lange, Andreas Hilpert

**MCE Berlin GmbH**
... is a life-cycle partner for energy supply companies and industrial plant operators. In addition to its focus in the power plant sector, the company also operates in the chemical and metallurgical industries as well as in district heating and gas supply.

- **Output volume in € million:** 2008: --, 2009: --, 2010: 36
- **Employees:** 2008: --, 2009: --, 2010: 329
- **Managing Directors:** Wolfgang Brodil, Wolfgang Peper

**MCE Maschinen- und Apparatebau GmbH & Co. KG**
... is a partner for mechanical, apparatus and plant engineering as well as machine assembly. Services range from airplane parts through rotors for water turbines to reactors for the chemical industry.

- **Output volume in € million:** 2008: --, 2009: --, 2010: 15
- **Employees:** 2008: --, 2009: --, 2010: 71
- **Managing Directors:** Jürgen Soyk, Wolfgang Peper

**MCE Aschersleben GmbH**
... manufactures structural steel pipes, offshore foundation components, pressure vessels, apparatus and individual pipe fittings for the energy and offshore sector.

- **Employees:** 2008: --, 2009: --, 2010: 73
- **Managing Directors:** Wolfgang Brodil, Wolfgang Peper

*not including subsidiaries