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SAMSON

magazine

Where Innovation is Tradition

September 2011

Report
Pearls, Petroleum and Technologies of Tomorrow

SAMSON GROUP

Contents

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For many years Dubai's economy was based on the rich crude oil and natural gas reserves found in the United Arab Emirates. Spectacular construction projects highlight Dubai's plans to diversify into sectors such as tourism.

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The Evolution of Customer Service

Dear Readers,

Up until recently, the term "after-sales service" was understood quite literally, i.e. service actually began a while after a product had been sold. After-sales service tasks were straight forward and clearly defined: on-site customer service, maintenance, repairs and supplying spare parts. Over the years, customer requirements have changed considerably and the range of after-sales services has extended as well.

Modern industrial processes – as well as the global economy they function in – follow a general trend that has made the applied technology and processes more and more complex. At the same rate, time constraints have become stricter. Just-in-time business can only be accomplished if all gears in the machinery mesh perfectly.

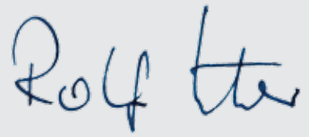
As a result, modern after-sales service starts way before a product is sold. Actually, it already starts at the development stage. This evolution is illustrated perfectly by the color-coded status indicators used in our smart positioners. Red, yellow and green icons show whether maintenance may be required. Such predictive maintenance strategies ensure the optimum performance and smooth functioning of plants in the long run.

It is exactly this service that our after-sales staff provides to our customers across the world. We at SAMSON are actively involved in the early stages of sizing and selecting valves that are perfectly tailored to the customer's specific needs to ensure the smooth running of the plant. Of course, our products are of impeccable quality as well. We offer a wide range of training schemes for our own staff as well as for our customer's staff so that the necessary know-how is always available where it is needed.

Our tasks also include start-up assistance and plant overhauls to schedule. Naturally, our spare parts are available at short notice anywhere around the world. The same applies to our on-site maintenance and repair service. With our 55 service facilities worldwide, we are quickly at hand when our assistance is needed. This quick availability of staff and material enables us to provide the best after-sales service that our customers rightfully expect of us.

To find out more about our after-sales service, turn to our Special Topic feature on pages 22 to 27.

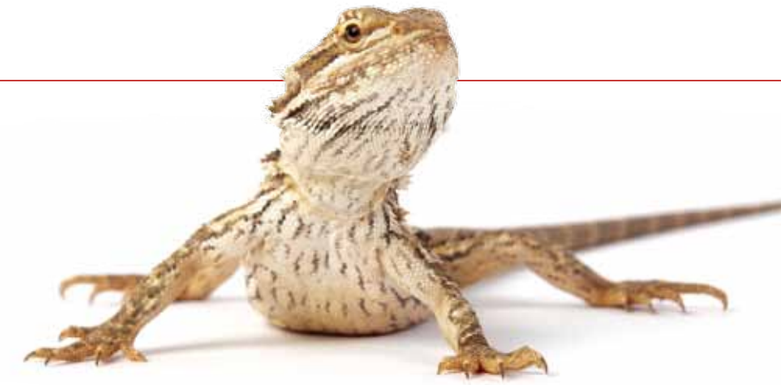
I hope you enjoy reading this magazine.



Rolf Körber
Head of After-sales Service

Still Flexible at ARCTIC TEMPERATURES

At first sight, diaphragms appear to be nothing more than pieces of black rubber. Nevertheless, the non-descript pieces are high-tech products that work reliably even under the most adverse conditions. Before we release diaphragms for series production, their prototypes have already completed a million full travel cycles at maximum pressure and spring force without showing the slightest signs of fatigue. We subject them to extreme heat and cold, severe vibration and chemically aggressive ambient conditions to prepare them for real continuous service. In many cases, the diaphragms are not only used in actuators, but directly in the valves themselves, where they separate the mechanical valve parts from the process medium. Whether they function properly depends on certain factors, including the rubber mixture used, optimum bonding with the fabric reinforcement as well as reliable clamping of the diaphragms to the surrounding components.



Extreme conditions as benchmark

In valves with pneumatic actuators, a set of springs holds the valve stem in its fail-safe position. To open or close the valve, compressed air is applied to the diaphragm plate, i.e. the sheet of metal to which the springs are attached. Without taking further provisions, the air would escape without any force being transmitted. This is where the diaphragms come into play: Acting as flexible seals between the actuator housing and the diaphragm plate, they ensure airtight shutoff and allow the force to be transmitted to the springs.

In our actuators, we use rolling diaphragms whose effective diameter remains unchanged while the travel motion is performed. This is decisive to keeping the actuating force constant. At the same time, the diaphragms must be flexible enough to perform the necessary travel movements over years or even decades without showing signs of fatigue. In most processes, these movements are rather small, with the valve oscillating only slightly around the set point in continuous operation. In such cases, the stress on the diaphragm is low. In our diaphragm production, however, we assume maximum stress to be the norm. Before a diaphragm goes into series production, we test it to the limit under extreme conditions.

Revealing deformations

These extreme conditions involve completing one million full travel cycles covering the largest possible travel range and working against the strongest set of springs usable for the diaphragm diameter. During tests in the climatic chamber, the diaphragm material must prove its resistance to heat and cold. We use destructive testing methods to create crack formations, which allow our material experts to draw conclusions on the diaphragms' resistance to certain operating conditions. In case unexpected problems occur, our experts can rely on their experience and expertise to determine the cause.

Determining the cause of such problems can require a lot of detective work. A few times in the past, our material experts were presented with damaged diaphragms, which had been selected specifically for the customer's plant following the accepted rules. The same diaphragms had been functioning properly in similar plants for many years, whereas they failed due to damage after only a few months at this customer's plant.

Based on the existing crack patterns, our experts were able to tell that solvents were involved somehow. However, the plant was supposed to be free of solvents. It required in-depth investigations on site to reveal the not-at-all obvious cause: The compressor for the compressed air system stood near the solvents tank farm. The air the compressor took in contained traces of the evaporated solvents, which attacked the diaphragms. Once the cause of the problem had been detected, it was easy for us to solve by supplying diaphragms unaffected by the solvents.

This diaphragm was specifically developed for oilfields in Arctic regions.

Flexibility at all temperatures

The diaphragms' seemingly nondescript rubber can be composed of various elastomers with different properties. The standard material for diaphragms used in pneumatic actuators is NBR (Nitrile Butadiene Rubber), which is cost-effective compared to other rubbers, resistant to oil and stable up to 100 °C. These properties are sufficient for most, yet not all, applications. In self-operated regulators, for example, the actuating force is not derived from compressed air but directly from the process medium. Such regulators are used, for example in steam networks of power plants where temperatures normally exceed boiling point. In such cases, EPDM (Ethylene Propylene Diene Monomer) diaphragms are used, which are resistant to steam and hot water.

As most plastic materials, the elastomers that the diaphragms are made of lose flexibility and become brittle at certain low temperatures. Standard materials can be used down to –40 °C. As more and more oil and gas deposits in Arctic regions are exploited, the demand for equipment that functions reliably at even lower temperatures is growing. To meet this demand, we and our raw rubber supplier have developed a special elastomer whose mechanical properties remain unchanged down to –60 °C. "Together, we experimented with a number of materials until we found this special elastomer mixture," states Klaus Bösche, head of the Materials Laboratory of SAMSON Frankfurt's R&D.

In-house manufacturing

Even before the first vulcanizing press was acquired in 1978, we had consequently focused on extending our in-house development and production facilities for diaphragms. Since then, we have gained extensive know-how in this field. This includes our own method of selecting the perfect fabric reinforcement and bonding it with the elastomer mixture without requiring a bonding agent. No additives are used to combine the stabilizing fabric with the rubber diaphragm during vulcanization.

The endurance test at –60 °C verifies that the mechanical properties of the diaphragm remain unchanged even at low temperatures.

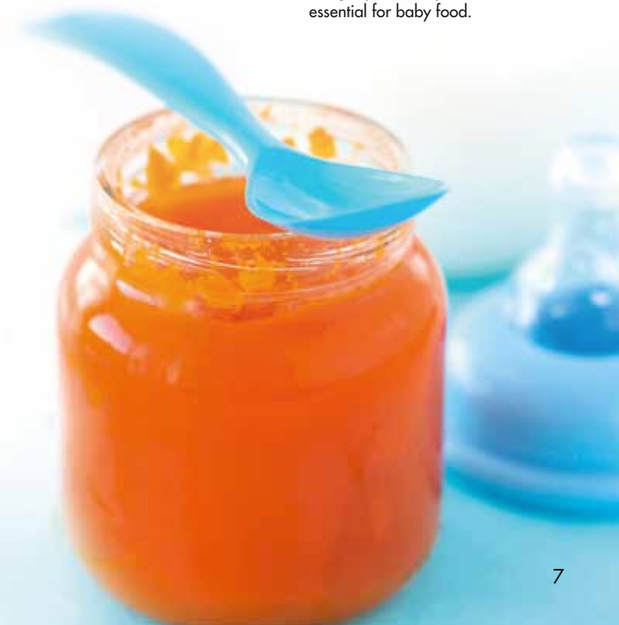
Doing without a bonding agent is particularly important in aseptic valves as they have a diaphragm in the actuator as well as directly in the valve. This diaphragm is located between the valve body and the bonnet, and replaces a packing as the valve stem seal to the atmosphere. This diaphragm seal prevents germs from getting into the valve's packing and guide sections. Such valves are mainly used in food processing and the pharmaceutical industry. As a result, the diaphragm should not contain more chemicals than absolutely necessary, which makes the lack of a bonding agent, i.e. an additional chemical substance, a huge benefit.

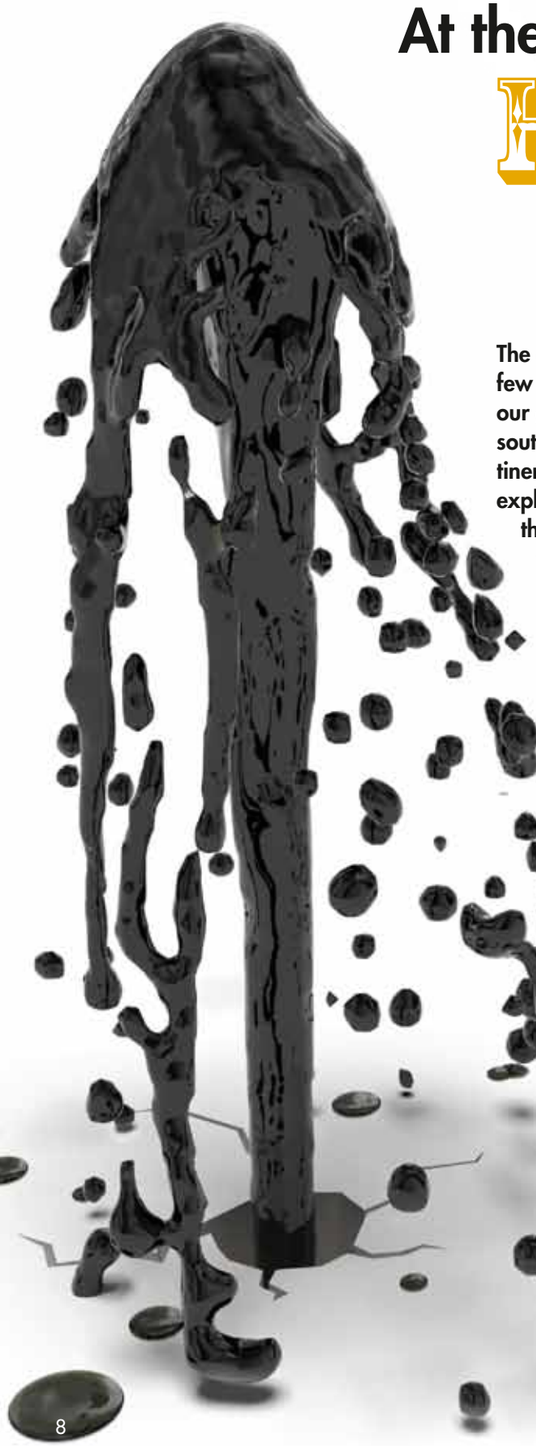
Aseptic and zero emission

The diaphragms used in aseptic valves must reliably withstand the constant mechanical and thermal stress in the process. In addition, they must not emit even the slightest traces of substances that could be detrimental to health. The governing rules and regulations are constantly growing stricter in this respect. This is why we were one of the first manufacturers to develop a new type of diaphragm for aseptic valves, introducing a diaphragm made purely of PTFE (PolyTetraFluoroEthylene) to the market.

Most of our actuator diaphragms are manufactured at the Frankfurt headquarters. Their areas range from 40 to 2800 cm². Material know-how and in-house manufacturing are the two key elements of our approach, which allows us to reliably supply high quality products and respond quickly to the specific needs of our customers.

Aseptic production and filling is particularly essential for baby food.





At the HEART of the Oil and Gas Industry

The oil and gas sector is one of the few truly globalized industries in our global economy. From north to south, from east to west, on all continents and oceans: the industry explores and exploits the resource that will continue to lubricate the worldwide economic machinery in the foreseeable future. If there is a place where all the players in the oil and gas industry come together, it is the district of Houston known as the Energy Corridor. The large oil companies as well as suppliers of drilling, extraction and refinery equipment and services have set up camp in the area. In addition, there is no other place in the world that sports a larger congregation of engineering companies than the Energy Corridor on the Gulf coast of Texas, where a huge share of the global oil and gas plants is planned. This is why SAMSON established a specialized subsidiary, SAMSON PROJECT ENGINEERING INC. (PEI), there in February 2010. The subsidiary is a perfect example of the entire industry: it works on a global basis.

State-of-the-art refinery

In 2005, the government of the Republic of Tatarstan, a constitutional state associated with the Russian Federation, entrusted Taneco with building the most modern refinery within the Russian Federation. Taneco is part of the Tatneft Group, one of Russia's largest oil companies. The old refinery in the Tatar city of Nizhnekamsk built during the Soviet era had previously been shut down. The new refinery constructed at Nizhnekamsk around 1000 km east of Moscow will be part of a large complex that also comprises petrochemical plants. This will allow Russia to reduce the amount of crude oil exported, while increasing the export share of finished oil products and further expanding the product portfolio. The Taneco complex is also aimed at extending the value chain of oil exploitation activities in the region, while observing the latest standards in environmental protection. On 30 December 2010, the first sections of the complex – the crude and vacuum distillation units (CDU/VDU) – were put into operation.

The refinery project at Nizhnekamsk is enormous and not common in everyday business, even by SAMSON standards. We supplied products from the entire SAMSON GROUP range, i.e. control valves, butterfly valves, on/off valves, motor-operated valves, desuperheaters and self-operated regulators. Despite the exceptional size of the project, the way it unfolded is typical of SAMSON PEI activities: "The project was mainly engineered by a world leader in the industry who is located in the Energy Corridor, of course," explained Abraham John, head of SAMSON PEI at Houston. "Our engineers cooperated closely with their planning engineers in selection, pricing and detailed engineering of these valves."

Houston, Frankfurt, Moscow

Sizing the control instruments involved various challenges: Certificates and approvals had to be obtained from the Russian authorities. The documentation had to be provided in Russian as well. The valves had to resist temperatures as low as –45 °C, which required them to be fit with special accessories. All motor-operated valves were equipped with ESD (Emergency ShutDown) functionality and most

One of the world's largest refineries is located at Nizhnekamsk, Russia. The complex is scheduled to process 7 million metric tons of sour crude oil annually into a wide range of petrochemical products.

Houston's favorable location close to the Gulf of Mexico helped it become a leading business center in the United States.

accessories were supplied as intrinsically safe versions. Many applications required the use of special materials. Redundant safety solutions were mandatory in engineering. In view of these requirements, Mr. John pointed out that the most important issue while tackling this challenging task was the smooth cooperation with the colleagues at SAMSON in Frankfurt, Moscow and at our sales representative in Tatarstan's capital, Kazan.

SAMSON PEI's office at Houston also received assistance from the North American headquarters of SAMSON located roughly 70 km away in Baytown, Texas. The staff at headquarters supports the engineering specialists mainly in their oil field projects in the Caribbean by providing instruments from an extensive stock as well as by assembling and supplying instruments quickly and at short notice. At SAMSON PEI itself, only one employee is involved in coordination and sales, while all other members of staff are engineers.

Full service to the customer's advantage

Mr. John describes the strategy of SAMSON PEI as follows: "We are dealing with a segmented market with established players and long-standing business relations. Compared to them, we are rookies in the Energy Corridor. Nevertheless, we have been able to score by providing our customers with excellent engineering and planning expertise – not through sales representatives, but directly from the source."

Around 1100 devices, weighing over 560 t in total, were supplied by the SAMSON GROUP for the refinery complex in Russia.

SAMSON PEI assists its customers all along the way, from the first days of planning to finally putting a plant into operation. For the Taneco project, this meant that Mr. John and his colleagues met with the staff from the engineering company nearly every day for eighteen months. The fact that their headquarters are located not far away made things practical. Nevertheless, the project also involved extensive travel to Frankfurt, Moscow and Nizhnekamsk, for example to commission the valves on site. Other strengths SAMSON can bring to bear in such projects are our short delivery times as well as the network of subsidiaries, engineering and sales offices and representatives all across the world.

Valves for severe conditions

When it comes to the valve themselves, we can count on some important benefits that customers often consider decisive in this highly competitive market. Mr. John underlines the modular design of our valves, which allows us to tailor our products to even the most unusual technical requirements. "This also includes our smart equipment complying with the latest communication standards for all common bus systems or wireless applications," says Mr. John. "Our products are customized to match the specifications and requirements of each individual application." This is of major importance, particularly in extreme climatic conditions or in offshore applications.

For example, special valves and accessories have been developed for offshore oil and gas extraction that withstand extreme pressures and ambient conditions. SAMSON PEI supplied such equipment as part of the project to relocate the Capixaba FPSO (Floating Production, Storage and Offloading) vessel off the Brazilian coast. These FPSO units are often used under particularly severe conditions. The constant, sometimes rough movement of the sea, the salty and humid air as well as abrasive and corrosive media being handled are the norm in the processes aboard these ships. The Capixaba extracts oil for Brazil's state-run oil company, Petrobras. The project was engineered by a company in the Energy Corridor. Mr. John explains that the project required special offshore painting regulations to be observed: "All accessories had to be made of stainless steel."

SAMSON PEI is also active in the Persian Gulf region, e.g. in gas extraction in Abu Dhabi. The engineers at Houston worked together closely with the new subsidiary established in Dubai (also see p. 12), which supports our customers in the region. Mr. John stated that the oil and gas sector was the clear focus of SAMSON PEI: "With the products and services that SAMSON offers for the oil and gas industry we have already made many good friends amongst our new neighbors in the Energy Corridor."

Abraham John (second from the left) and his team at SAMSON PROJECT ENGINEERING INC. (PEI)

Pearls, Petroleum and Technologies of Tomorrow

The Persian Gulf region has experienced an unparalleled economic development, in which the United Arab Emirates (UAE) has led the way. The dent in the growth caused by the recent world financial and economic crisis, which mainly affected the emirate of Dubai, has long been pounded out. The evolution from a purely oil-exporting region to a differentiated economy based on production and services is progressing by leaps and bounds. The population is growing rapidly and with it the demand for energy, air-conditioning as well as water and waste water treatment. In 2009, our SAMSON subsidiary in the region moved from the Sharjah emirate to the Jebel Ali Free Zone located in the harbor of Dubai. From here, it satisfies the demand for prime control equipment and first-class customer service, which is growing rapidly across the entire Arabian peninsula.

From pearls to black gold

It is hard to imagine today that pearls used to be the most important commodity of the emirates up until eighty years ago. The oysters bred in the shallow tidal waters of the Persian Gulf, which initially made the pearl banks easily accessible to divers who could harvest the precious merchandise. According to British reports from 1905, around 22,000 men on almost 1,300 boats were involved in pearling at the time. In the few seaports, the traders dealt in pearls, which were then sold on throughout the world. Apart from this, the thinly populated region hardly played a role in world economy at the time. And even the pearling business plummeted as the demand for pearls fell drastically due to the depression of the 1930s. Around that same time, the considerably cheaper cultured pearls from Japan came onto the market and superseded the products from the Gulf region.

Initially, oil, the "black gold", could not compensate for this loss. While oil was already being extracted in Kuwait and Bahrain, a little later also in Qatar and Saudi Arabia, it took the oil diggers until 1951 to establish the first oil company in the emirates and another eleven years until the first oil was exported from the

The Dubai Creek is a natural seawater inlet off the Persian Gulf. Originally, it was a trading site for pearls, which used to be the most important commodity in Dubai before the oil industry started.

emirate of Abu Dhabi. This, however, set off the emirates ascent into the modern world economy. Since then, the crude oil sales have provided the enormous income that has mainly been invested abroad. For example, the state-owned Abu Dhabi Investment Authority (ADIA) is believed to have assets of around $ 1,000 billion, which it invests almost everywhere except the Gulf region.

Petrodollars for new industries

According to the latest figures, the UAE ranks sixth in proved oil reserves and seventh in proved natural gas reserves worldwide. These resources will provide the UAE with an enormous revenue for a few more decades to come. Nevertheless, exporting raw materials and investing abroad are no longer the only sources of income the region relies on. Putting its petrodollars to use, the UAE has financed an unparalleled economic development: Dubai has evolved into a central hub in the worldwide logistics business, with its airport ranking twelfth by passengers and seventh by cargo in the first quarter of 2011. Spectacular projects, such as the Palm Islands artificial archipelago and Burj Khalifa, at 828 m the world's tallest building, have repeatedly put Dubai in the limelight of international media attention. In Dubai and Abu Dhabi, the emirate richest in oil reserves, important industrial plants have been established in the shadow of these more flashy projects by the chemical, metal working, fertilizer and food processing industries. In 2010, oil accounted for only 30 % of the UAE's gross domestic product.

The Palm Jumeirah is one of three man-made islands, built in the shape of palm trees. Construction of the Palm Islands started in 2001 to provide exclusive residential accommodation.

The dynamic growth in the economy and population make it necessary to quickly expand the infrastructure as well. The UAE figures among the world's fastest growing populations. When the seven autonomous emirates founded the UAE in 1971, they were home to only 180,000 people. According to the latest official estimates published in early 2011, the population of Emiratis has increased to almost 948,000, while the total number of expatriate residents rose to around 7.31 million in mid-2010, which equals a share of non-national residents of nearly 90 %.

Even if the growth rate has decreased slightly in recent years, the expatriate population is expected to continue growing. It even needs to increase further to accomplish the ambitious plans for the UAE's economy. To achieve these goals and supply the expanding population, one major requirement must be met: a sufficient water supply. As the Arabian desert holds hardly any natural groundwater reserves, drinking water is mainly produced in desalination plants. In Saudi Arabia, for example, 60 % of the water needed is recovered from the sea while the UAE is almost entirely dependent on desalination for its vital water supply; over 90 % come from desalination plants. The building boom, which has been nearly unbroken for decades, has additionally increased the demand for ventilation and air-conditioning systems. Fortunately, we at SAMSON figure among the major suppliers of high-quality control equipment for ventilation, air-conditioning as well as seawater desalination.

Market access through petroleum

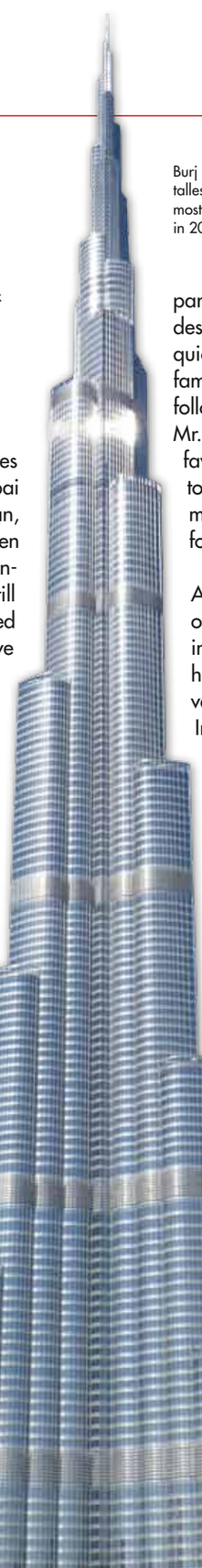
"Over the years, a considerable number of SAMSON products has been installed in various sectors of industry and the infrastructure in the region," reports Zulfiqar Mooraj, head of SAMSON CONTROLS FZE headquartered in Dubai. "We do not know the exact number as most products got here via the different plant engineering companies active in the region." Mr. Mooraj estimates

The olefin cracker at the Borouge 2 complex in Abu Dhabi is one of the world's largest plants of its kind.

that around 10,000 control valves have been installed. As many end customers contact SAMSON directly as soon as they need their control equipment to be serviced, we have direct access to the market.

For many years, we have been represented in the Gulf region by commercial agencies. Our own subsidiary was initially established in the Sharjah emirate in 2006, a seaport rich in tradition. In 2009, the headquarters were moved to the Jebel Ali Free Zone (or Jafza) located in a port of Dubai. In one of the world's fastest growing free zones, no tax and customs duties apply. Additionally, foreign investors do not require a national sponsor to do business as in the rest of the country.

An important impetus to increase our presence in the region was given by the large-scale Borouge 2 project, an olefin cracker put into operation in 2010. The cracker is part of the Ruwais industrial complex established in Abu Dhabi. This is where the UAE's largest refinery, a 1.5 MW power plant as well as numerous petrochemical and an increasing number of chemical plants are located. Borouge 2 is one of the world's largest plants of its kind, producing an annual output of 1,500,00 t of ethylene, 540,000 t of polyethylene and 800,000 t of polypropylene. It was planned and built by a renowned German plant engineering company. Mr. Mooraj says: "We supplied 1,000 control valves for the project and one of our service technicians worked exclusively for this project for one year." Sending a dedicated technician was made necessary by the strict safety regulations that apply as access to the plant is only granted to persons that possess a special permit.



Burj Khalifa at 828 m is currently the world's tallest building and has become one of Dubai's most important landmarks since its completion in 2009.

Routine in a multicultural environment

In addition to the UAE, the sales area of our subsidiary at Dubai covers Saudi Arabia, Oman, Qatar, Kuwait, Bahrain, Yemen and Pakistan. Sales representatives and agencies are still involved in business conducted in these areas and they receive extensive support from the twelve members of our Dubai staff. "Even though our sales area is rather large, we can quickly assist most of our customers on site thanks to Dubai's excellent traffic links," points out Mr. Mooraj. Bureaucratic obstacles are virtually the only hindrance that can impede prompt on-site service. Depending on the country or emirate, visa as well as special permits may be required, which may take some time to obtain.

It is that much easier to keep the warehouse and workshop stocked in the Jebel Ali Free Zone, where some of the products for the regional market are assembled. Deliveries to and from Jafza are free of duty. Duty is not paid until the valves and spare parts are delivered to their places of destination. "Customs handling is quick and unproblematic if you are familiar with the procedures and follow them as required," explains Mr. Mooraj. Dubai also provides favorable conditions when it comes to tax and labor laws. Work permits are granted within a week, for example.

As is common in the UAE, the staff of SAMSON CONTROLS FZE is international. Mr. Mooraj: "We have a very young, highly motivated team of employees from India, Pakistan, Germany and the UK that masters our sales area independently and without any problems."

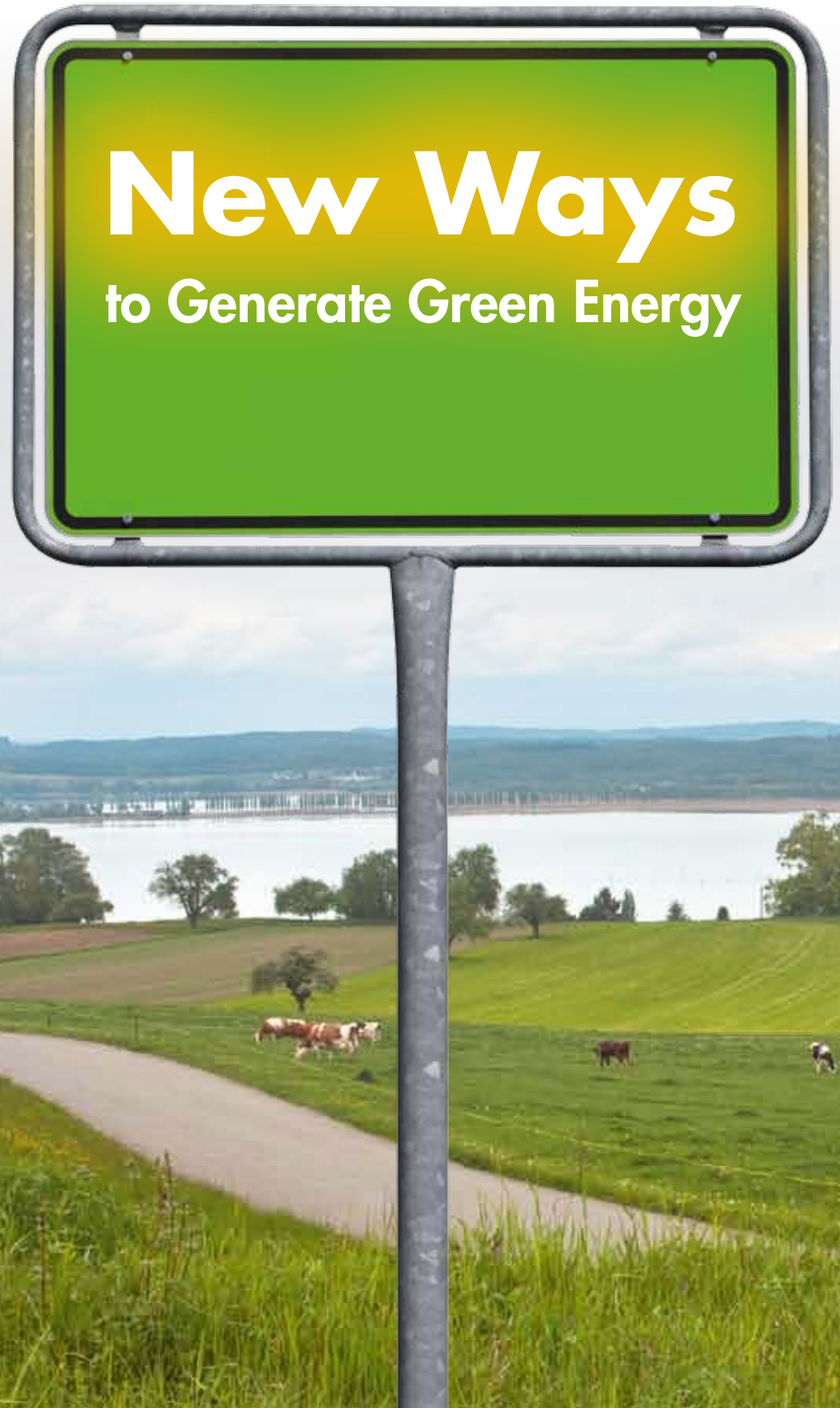
A renewable perspective for tomorrow

The seed for further growth in the Gulf region has been planted and an end to the boom is not in sight yet. A large share of the worldwide oil and gas supply will continue to come from the region. The countries active in extraction have started to further process a larger share of the crude oil they produce. In addition, they have taken up an increasing number of ambitious projects that go beyond the realm of fossil fuels: consultants at KPMG predict that the world's three largest chemical companies will be headquartered in the region by the year 2015. In addition, considerable efforts are being made to use the oil revenue for the development of ecological technologies and renewable energy.

At Masdar City, Abu Dhabi is in the process of building the world's first carbon-neutral city entirely powered by renewable sources. Solar-powered desalination plants will supply the water; electricity will be generated by photovoltaic and wind power systems. In total, the per-capita energy consumption is expected to drop to 25 % of today's average. Systematic recycling is to ensure an almost zero-waste ecology. Internal combustion vehicles will be banned from the city as well. A cutting-edge public transportation system is planned to take passengers in driverless cabins to programmable locations. Fresh air intakes and parks will be located at the shaded street level and thus reduce the heat passively. Nevertheless, artificial cooling will be indispensable in the hot and dry desert climate, with district cooling providing a solution with a particularly high energy efficiency. News of this solution got around quickly in the entire Gulf region, where district cooling plants are becoming more and more popular.

Mr. Mooraj explains that "from a technical point of view, district heating and district cooling are the same." According to him, our extensive experience in district heating will open up an additional business segment: "We will be able to serve our customers with first-class products, extensive expertise and our high-quality after-sales service in the new sectors as well as the traditional oil and gas business."

Zulfiqar Mooraj (middle) among his team at SAMSON CONTROLS FZE in Dubai.



Alternative energy is on the advance. Public attention, however, is focused mainly on power generation. Using waste heat for heating and domestic hot water applications is a topic reserved mainly for the experts. Above all in local and district heating, certain developments have opened up additional ways of cutting back on the use of fossil fuels – and they also appear to be money-savers. In fall 2009, the small South German town of Orsingen-Nenzingen near Lake Constance set up a local heating network supplied by waste heat of an animal carcass incineration plant. A unique process allows the previously un-used waste heat to be stored and used even when the incinerator itself is not in service. SAMSON supplied the instrumentation as well as valuable know-how for this innovative project.

Ingenious idea

In Germany, the disposal of slaughterhouse waste and animal carcasses is governed by strict hygienic rules. As a result, such wastes are handled only by highly specialized animal carcass incineration plants. One such incinerator is located in the small town of Orsingen-Nenzingen in the southern German state of Baden-Württemberg. The incinerator is used to burn carcasses from twelve districts in the region. Up until 2002, animal waste was turned into animal fat as well as meat and bone meal, which were sold as animal feed. This practice, however, was prohibited within the EU following the BSE crisis. EC Regulation 1774/2002 banned animal by-products arising during the disposal of dead animals from being marketed as animal feed. At the time, this regulation caused a considerable dent in the sales of Protec Orsingen, the special purpose association of the local authorities that

Strict hygiene rules mean that slaughterhouse waste can only be disposed in highly specialized incineration plants.

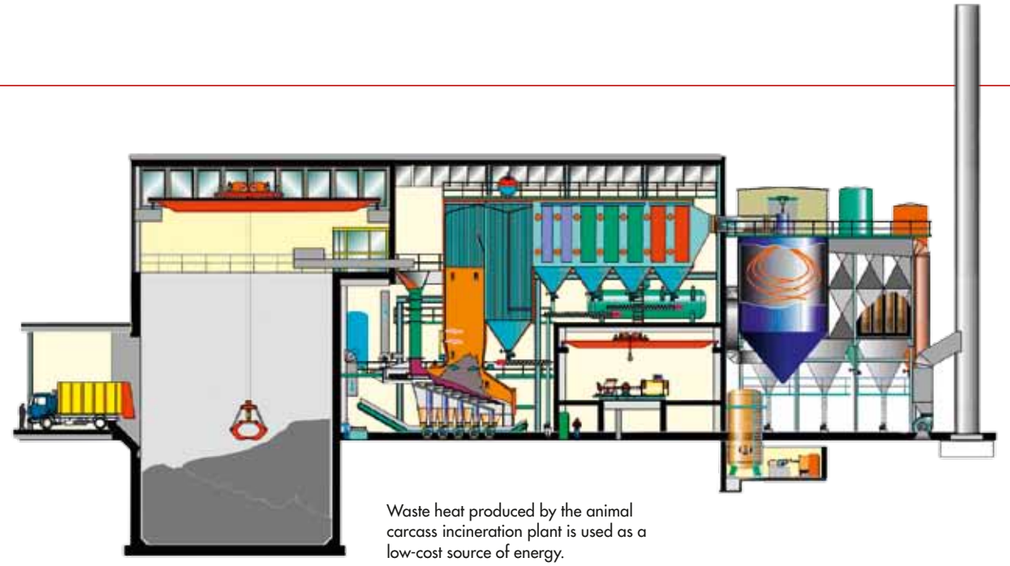
operates the incinerator. As energy prices were also increasing, the Protec management decided to invest in a state-of-the-art plant that would burn animal fats to generate heat.

The combustion plant and the process of using waste heat were developed by the European Technology and Trade Center (ETTC). The company based in nearby Constance specializes in solutions for supply and disposal. Since 2003, Protec has been using animal fat instead of gas and fuel oil to run the incinerator. The animal fat has the same properties as light fuel oil but it is a renewable raw material. "Initially, we only wanted to optimize the process in the incinerator. Then we got the idea that the waste heat from the incinerator could be used as well," states Thomas Nikolaus, owner and CEO of ETTC. He describes the special challenge involved in finding a process that would advance the use of renewable energies and thus environmental and climate protection. Consequently, ETTC bore the costs of developing the local heat supply concept itself and decided to not patent the process to promote the use of so-far unexploited energy sources. This means that other engineering companies can adopt the process free of charge. Mr. Nikolaus is convinced that approximately 50 % of the total heating power needed across Germany could be covered using waste heat.

Engineering challenges

The biggest problem to be solved at Orsingen-Nenzingen was finding a way of efficiently using an energy source that would not be available year-round. Mr. Nikolaus explains that the carcass incinerator only operated around 4,000 hours annually, i.e. just under six months of the year. This is why a huge buffer tank holding 550,000 liters of hot water was installed. It serves as a kind of battery and makes sure that heat is constantly available, even when the incinerator is out of service. While the incinerator is running, the waste heat from the incineration is routed through a sophisticated piping system into the tank, where the heat is saved. On demand, the buffer releases heat to the local heating network through a heat exchanger. On cold winter days, the saved heat may not suffice to cover the demand. Then, additional animal fat is burnt to heat up the buffer again.

The major share of the control instrumentation for the local heating system was supplied by SAMSON. Our equipment is installed in the animal carcass incinerator as well as in the homes of the participating end users. In addition, we were already involved in the development stages and provided valuable expertise and know-how to ETTC and Protec Orsingen. According to Mr. Nikolaus, support by the SAMSON staff was excellent: "The system has been running virtually without any problems from the very first day."



Waste heat produced by the animal carcass incineration plant is used as a low-cost source of energy.

Favorable ecological balance

A total of 6 MW of waste heat is generated in the animal carcass incinerator each year. Currently, only 18 % of this waste heat are used. Soon, the share is expected to double to 36 % as the local heating network will be expanded. A second construction phase is already under way, with SAMSON being involved again. "We strive at extending the network so that we can pass on the entire waste heat to the end users, if possible," outlines Mr. Nikolaus.

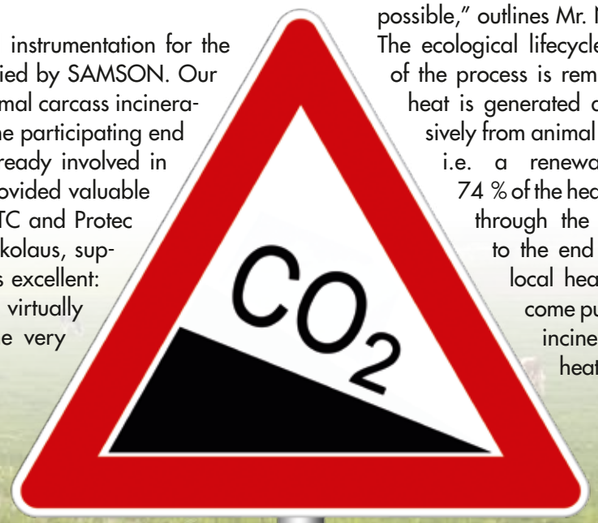
The ecological lifecycle assessment of the process is remarkable: The heat is generated almost exclusively from animal by-products, i.e. a renewable source. 74 % of the heat transported through the water pipes to the end users of the local heating network come purely from the incinerator's waste heat; a further 24 % are generated by burning animal fat. Only the remaining 2 % come from fuel oil due to reasons relating to the process. According to ETTC, a total of 524,000 l of fuel oil and 1,400,000 kg of CO_2 are saved at Orsingen-Nenzingen each year.

On-going expansion

Currently, private, commercial and public customers are connected to the four supply lines for the local heat by Protec. Further users have already expressed their interest for the second construction phase. Mr. Nikolaus says that their project was very popular: "If a street is included in the local heating network, around 80 % of the residents decide to have their building connected." Apart from the favorable environmental effects, the competitive pricing speaks in favor of the local heating network. End users do not have to make any investment: they do not pay any connection fees and the heat transfer stations for their buildings are provided free of charge. This is only possible because Protec can operate the network without having to purchase the "fuel" burnt.

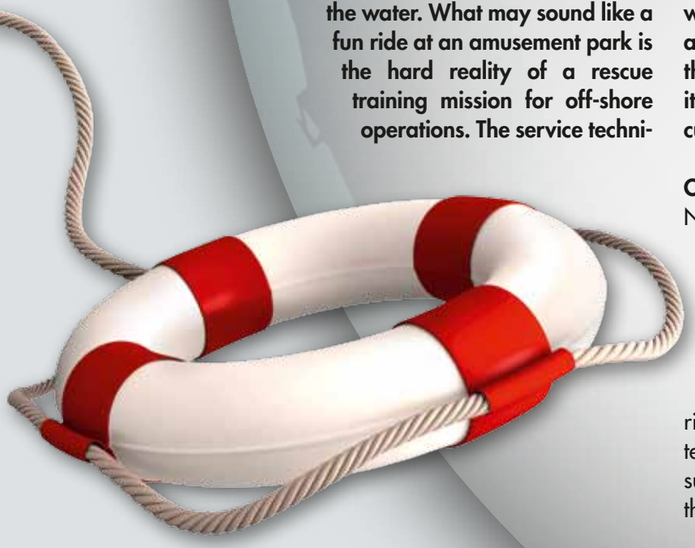
Project with model character

Mr. Nikolaus hopes that the process is adopted by many other local authorities and private investors as quickly as possible. Currently, ETTC is planning a new animal carcass and special waste incineration plant with local heating network near the Polish city of Katowice. He underlines the importance of the investment at Orsingen-Nenzingen as a project with model character. This model project could only be implemented thanks to the instrumentation, controls and know-how SAMSON brought into it. And it will continuously be developed further. In the future, the network between the end users and the generation plant is to be remodeled using our SAMSON products to permit Protec Orsingen to control the amount of heat supplied exactly and conveniently from the process control station.



Dedicated to CUSTOMER SATISFACTION

Putting on protective clothing and a life jacket is mandatory before getting on the lifeboat. Then, the safety harness is tightened. The head is strapped in as well to hold it in place when the boat is launched like a rocket, flies through the air and lands hard on the surface of the water. What may sound like a fun ride at an amusement park is the hard reality of a rescue training mission for off-shore operations. The service technicians working on oil rigs out on the open sea need to go through this straining safety training as well, even if their stay on the rig is only temporary while they perform maintenance work. Truth be told, such special and demanding tasks are an exception in the daily customer service routine. Nevertheless, they are handled with the same unconditional dedication and commitment to ensuring customer satisfaction as the everyday work. SAMSON's highly qualified service technicians are committed to this objective: At 55 locations across the world – each one with workshop and storage facilities –, the technicians demonstrate what service to the customer really means.



Offshore, onshore and under water

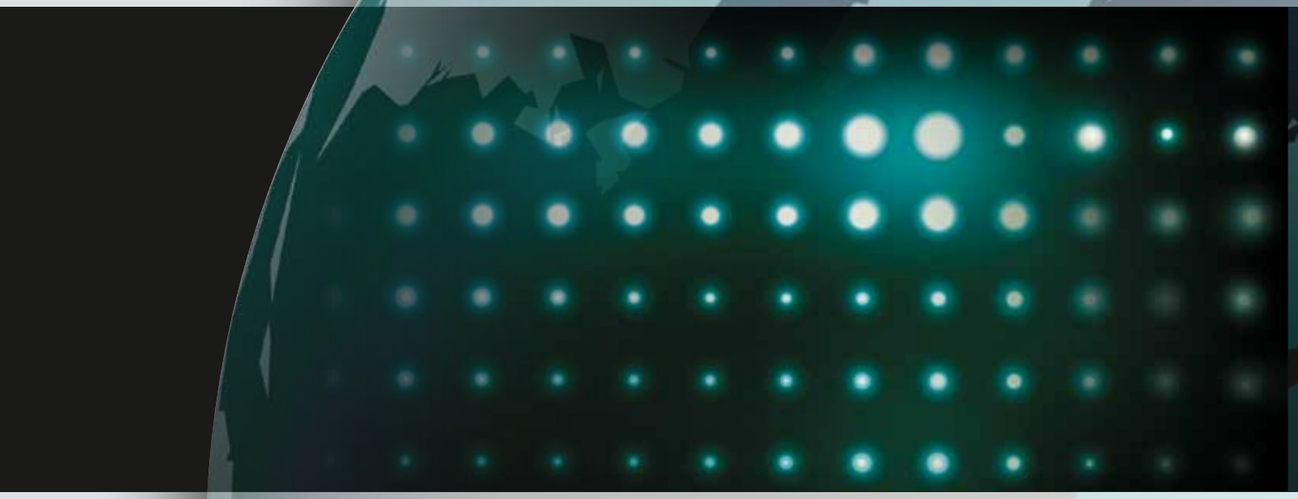
Nerves of steel and a certain thirst for adventure are what our service technicians need if they volunteer to take part in such special training programs. They not only master rescue missions from oil rigs; they are also trained to quickly climb out of the smashed-in window of a helicopter after an accident. These are necessary skills for technicians deployed to offshore rigs, where they are usually transported by helicopter – and not by ship as one might expect. To simulate such emergency situations under realistic conditions, the training takes place in a water tank complete with swell, artificial thunderstorms and in total darkness. "Around ten of our technicians have volunteered to perform such special tasks and undergo the associated training," says Rolf Körber, who has been the head of SAMSON's After-sales Service for twenty years. "They are always out and about, traveling the world to assist the colleagues at our various subsidiaries. But nerves of steel is really what anyone working in our customer service needs to have," adds Mr. Körber.

This is true as even the service work in ordinary industrial plants can sometimes make the technicians feel uneasy. Our SAMSON equipment is used below ground, in potentially explosive atmoshperes as well as in plants where highly toxic substances are handled. As a result, it is of utmost importance to stay calm, even if the repair or service work is to be completed quickly, which is the normal case. Having to work according to tight schedules, however, must never impair the diligence the technicians take in their work as Mr. Körber points out: "The best way to ensure that our people retain strong nerves in any situation is to make sure that they know the valves inside out. This is why we place great emphasis on thoroughly training our staff." Some service technicians are new to the job while others have already gathered wide experience in the industry. As a result, the training scheme is tailored to the prior knowledge and experience of each trainee technician.

Understanding plants, mastering valves

In Germany, where most of the after-sales service technicians are employed, new staff used to be recruited preferably from the ranks of the instrumentation and controls mechanics. But with the evolving

Safety training includes practicing an emergency evacuation from an offshore platform.



After-sales service on site at the plant needs to be carefully planned in advance.

technologies, the German vocational training schemes have changed as well so that this specialized qualification no longer exists. Today, the rookie service technicians mainly have qualifications in mechatronics or electrical engineering, which means that they need to learn the basics as well as the subtleties of instrumentation and control engineering first. They need to gain a thorough understanding of the entire controlled system before they get into the details of all the different SAMSON products. This approach enables the technicians to grasp the overall concept of the plant they are supposed to service or repair.

Once the new service technicians have a grip on the control basics, they spend extensive time at SAMSON's in-house training facilities acquiring skills at assembling and disassembling the various products. In addition, they learn all the valuable tricks from their experienced peers. By the way, such training programs are also offered for the service staff of our customers.
The SAMSON repair workshop is where the after-sales specialists are prepared for the day-to-day work, where they are confronted with the reality of their job. And this reality may deviate considerably from the facts given in the technical specification sheets. For example, screws and bolts may be corroded, connections may be bent or the technicians may be faced with instruments that have long been removed from the range of available products.

Good preparation is the key
As will become evident, the real challenges of working in after-sales service are not presented by the spectacular offshore training programs, but rather lie in overhauling the valves installed in a large plant. Many plants are shut down at regular intervals for a thorough inspection and service. Naturally, plant operators strive at keeping the plant shutdown as short as possible, which means that the entire service work is to be performed fast but without detriments to service quality. For the fifth time already, our SAMSON service technicians accomplished exactly this during a four-week shutdown of a large German chemical complex where they serviced all pneumatic control valves installed in a steam cracking plant.
A total of 115 control valves – of which 25 had a nominal size greater than DN 200 – were removed from the plant, transported to Frankfurt and repaired in our service workshop. At the same time, a team of four technicians worked on site, installed new valves, overhauled valves welded into the piping system and monitored the proper disassembly of the valves that still contained process medium before they were cleaned. "When handling such projects, everything must mesh together perfectly," underlines Mr. Körber, adding "and this requires detailed planning and highly committed staff who are exceptionally skilled at what they do."

When such a large-scale service project gets under way, all spare parts for a tag number have already been prepared for on-demand delivery from the spare parts stock. The same applies to the special tools, which may have enormous dimensions just like the valves they are used on. A maximum of six workdays was available per valve, regardless of the number of valves delivered to the workshop per transport, regardless of the nominal valve size and regardless of the condition the valves were in. In fact, work on each valve had to be completed within six hours. Planning for the project began six months earlier. In the end, 25 members of staff at SAMSON Frankfurt and on site at the plant gave their best to ensure the overhaul ran smoothly and to the customer's satisfaction.

Across continents
At least the valve transport did not pose a huge challenge in this service project as the overhauled plant is located less than 100 km from our SAMSON headquarters at Frankfurt am Main. Things look different, however, if the plant and our headquarters are almost 9,000 km apart: In the Chinese city of Nanjing near Shanghai several plants of a chemical complex have recently been overhauled as well. The multinational corporation operating the complex produces intermediate products, for example for rigid and soft foams used in insulating materials, upholstery, mattresses and car seats. As Nanjing is located more than 1,000 km away from the Chinese capital of Beijing, where SAMSON China has its headquarters and repair workshop, the plant operator let the technicians use a shed on site. As a result, the SAMSON staff, who traveled to Nanjing from Beijing

Special tools are often required, for example to remove and remount the valve seats.

The committed team of service technicians work together to overhaul valves at a steam cracking plant.

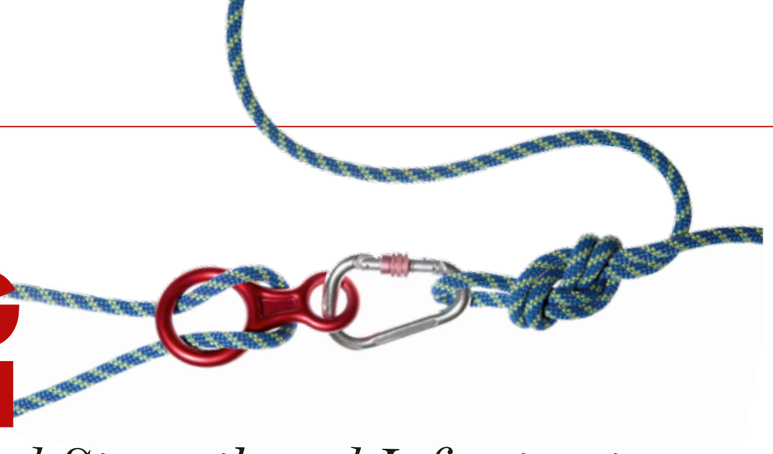
and Frankfurt, had a place where they could set up their equipment, store the necessary spare parts and perform the actual maintenance work.
In some cases, the after-sales service experts are called in way before a plant needs to be overhauled. Upon our customers' request, the technicians provide assistance on site already at the time when the valves are put into operation, even if this start-up phase lasts a little longer. For example, four of our technicians from Germany and Dubai spent eight weeks in Abu Dhabi helping our customer prepare and complete the start-up of approximately 1,500 globe and butterfly valves in the new petrochemical complex at Ruwais, UAE. This way, any arising problems could be solved on the spot and a successful partnership was formed. This partnership is now maintained by our recently opened subsidiary at Dubai (also see p. 12), which has taken over the everyday support of the Ruwais plant and other sites in the region. "For us, providing customer service also means being close to our customers," explains Mr. Körber. He adds that SAMSON never hesitates to set up new service centers when the need for continued on-site assistance arises: "This is why we will soon expand our after-sales service facilities in Russia and establish a new service center at Kazan."

Service starts with R&D
At SAMSON, our after-sales service and R&D have always worked hand in hand. The experts from both fields meet regularly to exchange opinions and experiences, to perfect our products and to optimize maintenance. This also includes adding smart features to our instruments, which enable long-term predictive maintenance. Back in 2007, one of our customers decided to equip all 1,300 valves installed in a new plant with extended diagnostic functions. The plant is located a few thousand kilometers away and the valves are installed in the hazardous area. "Together with the customer, we developed a database that automatically records all diagnostic data, which can then be read via the control system," describes Mr. Körber. This allowed the customer to access all data in the plant itself or from any other location at any given time. Even our technicians at SAMSON Frankfurt could access all data relevant to planning and maintenance.

Keeping track of the lifecycle
What started out as a tailor-made solution for this specific customer has evolved into a sophisticated diagnostic assessment tool: TROVIS SOLUTION. The tool saves diagnostic data from control valves equipped with smart SAMSON positioners in a database, providing the plant operators as well as our service technicians with a sound basis for scheduling maintenance work. Amongst other data, assessments of partial stroke tests and a diagnostic history covering the valve's entire lifecycle are saved in the database for each tag number. Critical valves are monitored constantly so that possible faults can be identified ahead, before they can cause any real problems. Problematic valves that will require maintenance during the next plant overhaul are marked automatically.

The TROVIS SOLUTION web portal grants access to the database from anywhere in the world via an encrypted connection, which ensures data security. The transmitted diagnostic data are analyzed and compiled in detailed reports. In case the smart positioners have generated alarms, the plant operator is given information on predictive maintenance. In addition, trends of the process data recorded in the plant can be displayed.

The database is hosted at our Frankfurt headquarters. Data can be selected by control valve property. Dynamic and static variables can be compared. As a result, the database includes the necessary information for process optimization. Mr. Körber points out that, when looking at the overall lifecycle costs, the necessary investment in such a predictive maintenance scheme is tiny compared to the benefits it brings. Plant downtimes and maintenance costs are minimized and even during normal operation, plant operators can make their processes more efficient. "For us at SAMSON, customer service means that we put the customers and their needs first. We assume great responsibility for the control valves and ensure that everything runs smoothly," affirms Mr. Körber.



STRONG GROWTH

and Strengthened Infrastructure

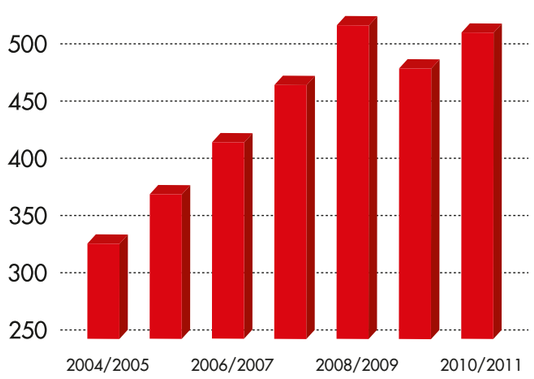
Having overcome the economic and financial crisis of recent years, the global economy has picked up speed again. Record results have already been scored in certain regions and industries. On the whole, SAMSON has experienced a phase of boom, yet with certain concessions. This boom is based on the dynamic growth in industrial production, where our SAMSON products are used. For the past 2010/2011 financial year, the entire SAMSON GROUP recorded a double-digit increase in orders received, which is a very positive development. Consolidated group sales increased by 8.3 % to EUR 509.8 million. At the same time, we strengthened our production and service infrastructure: Two new subsidiaries in Europe and South America were added to extend our worldwide sales network. We also invested heavily in the production capacities at our associated companies in Italy as well as at our Frankfurt headquarters.

Western Europe remained the top sales region of the group. The subsidiaries and sales offices increased their sales by 5.9 %. SAMSON Spain showed a particularly good development. Thanks to numerous projects in solar power and seawater desalination, it has become the second strongest subsidiary in Western Europe. Our subsidiary in Turkey has also grown considerably and even outperformed its record result of 2008.

Our associated companies AIR TORQUE and STARLINE built new production facilities at Bergamo, Italy. With an area of 15,000 m² for production and 3,000 m² for offices, the companies are able to respond flexibly to the increased demand for pneumatic rotary actuators and forged ball valves.

Sales have also increased in Eastern Europe. The subsidiaries in Russia, Poland and Hungary developed particularly well. SAMSON Russia considerably extended its activities in oil and gas, for example with the large-scale refinery project in Tatarstan (also see pages 8 to 11). The SAMSON GROUP mastered the considerable technical and logistic challenges to the full satisfaction of the customer.

Financial year 2010/2011



Net sales in million euro

In Romania, the integration of the national economy into European structures progressed quickly. Demand for our products increased so that we opened a new subsidiary there to better serve our customers. The freelance sales representatives in the region also helped increase the sales volume.

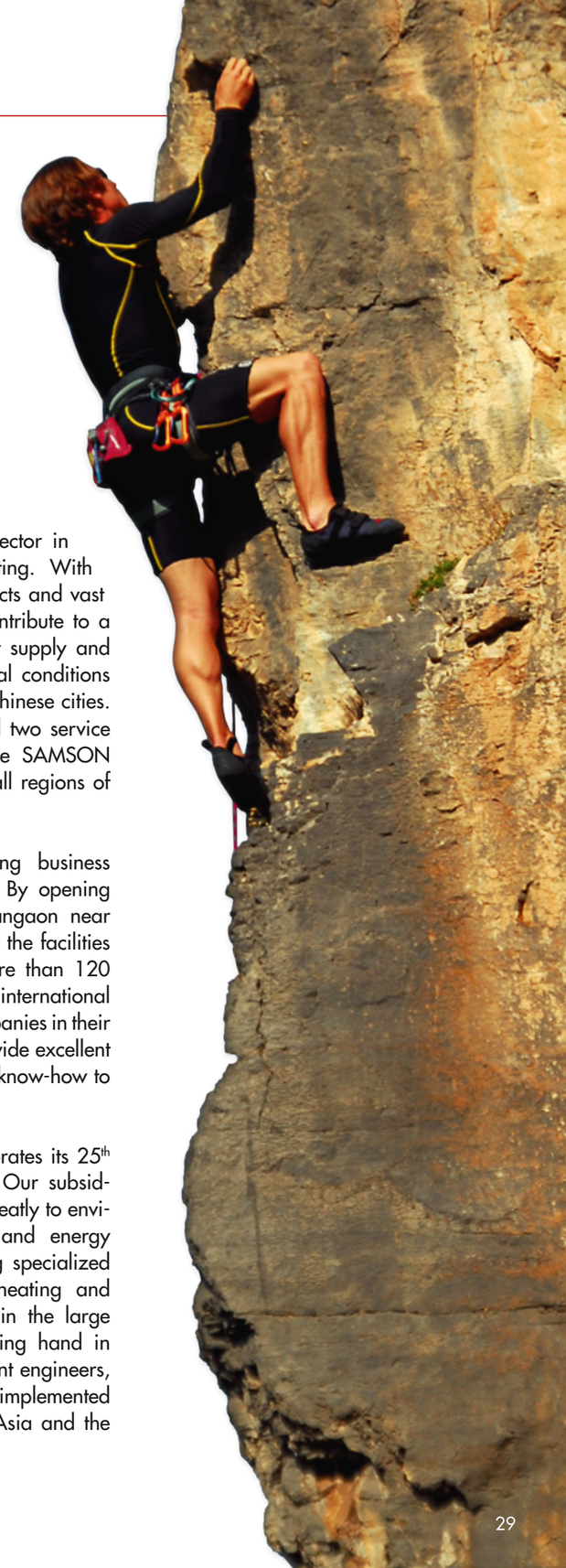
Asia and Africa contributed the second-largest share to the worldwide SAMSON sales after Western Europe. Twelve subsidiaries and three service centers with over 370 employees represent SAMSON on these continents. With a plus of 37 %, they recorded the highest growth.

In China – the market with the second-highest importance to the SAMSON GROUP after Germany –, our subsidiary managed to increase its sales by 75 %. Investment was focused on the two centers at Nanjing and Shanghai, which play an important role thanks to their close ties with the chemical industry. Business with the technical gases industry has also developed very well. Many of the international companies operate air separation plants in China. In cooperation with the national manufacturers, these plants are serviced by the Shanghai office, where we focused our industry-specific expertise.

A further interesting sector in China is district heating. With our high-quality products and vast know-how, we can contribute to a safe and efficient heat supply and improved environmental conditions in many of the large Chinese cities. Six branch offices and two service centers ensure that the SAMSON GROUP is present in all regions of the huge country.

We expect a lightning business development in India. By opening the new site in Ranjangaon near Pune, we have created the facilities for future growth. More than 120 employees will assist international plant engineering companies in their projects as well as provide excellent logistics and technical know-how to Indian end users.

SAMSON Japan celebrates its 25th anniversary this year. Our subsidiary has contributed greatly to environmental protection and energy efficiency by providing specialized products for district heating and cooling systems used in the large Japanese cities. Working hand in hand with national plant engineers, SAMSON Japan has implemented numerous projects in Asia and the Middle East.



The Rotary Resource Center in Edmonton, Canada

Our subsidiary in Thailand celebrates its 10th anniversary this year and can look back on a very successful development. Last year, large projects in the petrochemical sector boosted our sales considerably. To improve service for these customers in Thailand, we have expanded our service facilities at Rayong. We are currently in the preparations for opening a subsidiary in Vietnam, which we will take a closer look at in the next edition of the SAMSON Magazine.

In the Americas, sales increased by a total of 13 %. Our four subsidiaries in the NAFTA zone recorded double-digit increases. The recently established company SAMSON PROJECT ENGINEERING INC. (PEI) considerably strengthened our presence in the region and the worldwide oil and gas business (also see pages 8 to 11). The new Rotary Resource Center was opened at Edmonton in August 2011 to further expand our service facilities in Canada. It will provide the constantly growing oil and gas sector in Alberta with short delivery times, rapid service and competent on-site assistance.

Our South American subsidiaries in Argentina, Brazil, Chile and Venezuela also developed satisfactorily, recording a sales plus of 20 %. In 2010, we opened a new subsidiary in the Peruvian capital of Lima to mesh our sales and service network in Latin America even more tightly.

Nobuteru Sawayama (middle) surrounded by his team at SAMSON K.K. in Japan.

25 years of SAMSON Japan
Our subsidiary in Japan, SAMSON K.K., was founded in Tokyo on 1 August 1986. The following year, the subsidiary's head office was moved to nearby Kawasaki. Later, branch offices were created at Tokyo, Osaka, Shikoku, Shunan and Yokkaichi. In 2008, the head office was expanded considerably and relocated to new premises in Kawasaki. Since 2009, a dedicated project engineering department has been active in handling international projects. In view of the earthquake and resulting catastrophes that hit Japan in early 2011, no special anniversary celebrations will be held. Instead, participation in the INCHEM fair held in Tokyo in November will mark the anniversary.

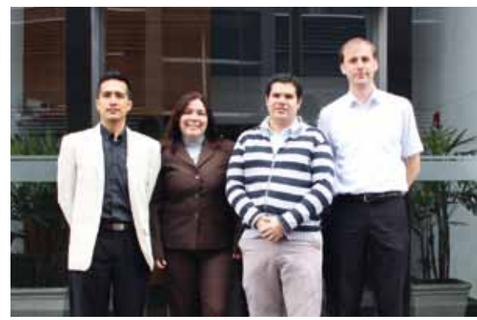
10 years of SAMSON Thailand
Our subsidiary in Thailand, SAMSON CONTROLS Ltd., was founded in 2000 and started business in 2001. The subsidiary's head office is located in the business zone of Rayong, where many large Asian and Western corporations have settled near the deep-sea harbor. In 2004, a branch office was established in Bangkok, the capital, which is approximately 200 km from Rayong. In addition, our subsidiary cooperates with two sales representatives to target the remote areas in the north-east as well as the pulp and paper industry. So far, the largest order involved supplying around 1,100 control valves in different types with matching positioners for the Map Ta Phut olefins project by SCG Chemicals.

New subsidiary in Romania
Our subsidiary in Romania, SAMSON CONTROL S.R.L., was founded on 10 December 2010. Most of the employees were recruited from CBC ARMATURI INDUSTRIALE S.R.L., which had been our sales representative for Romania until then. The head office in Bragadiru close to the capital, Bucharest, were also taken over. New facilities with a larger warehouse, a workshop including test bench and additional offices are currently being built. Our subsidiary serves all sectors of the Romanian processing industry, from chemicals, petrochemicals and food to district heating.

New subsidiary in Peru
Our subsidiary in Peru, SAMSON CONTROLS S.A., was founded in June 2010 in the Peruvian capital of Lima. It serves our customers in the Andean country, who are mainly active in the food, textiles and steel industries. With this new foundation, the number of SAMSON subsidiaries in South America has increased to five.

Junlanop Chantabunyakul (middle in the front row) together with his team at SAMSON CONTROLS Ltd. in Thailand.

Cornel Dumitru, Calin Grigoriu, Bogdan Serban, Mihai Andries and Calin Corbu belong to the team at SAMSON CONTROL S.R.L. in Romania.



Dr. Alberto Tamm (right) with his team at SAMSON CONTROLS S.A. in Peru.

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