WHAT’S NEXT FOR CARS?
We take a look at the future. What concepts and drive systems will prevail?

COMBINED
Lifting columns ensure secure patient positioning in the operating room

REFINED
An REE audit at the Mina Al-Ahmadi refinery optimizes compressor performance
I am pleased to present you with 2014’s first issue of HOERBIGER@MOTION, our customer magazine.

After seven years, we have decided to give our customer magazine a new structure and an updated look – journalistically, illustratively and graphically. HOERBIGER is a modern technology group. Our customers value our ingenuity. In many fields, our research and development employees are considered visionaries of the industry.

We would like to let you, our readers, share in the topics that move us.

In the newly established FEATURE category, we address important future topics from our markets: from the oil, gas and process industries, from mechanical and plant engineering, as well as from the automobile industry, which is the thematic focus of this issue.

In the DRIVE category, you will find the customer reports that our readers genuinely appreciate. The articles revolve around exciting projects conducted by our customers and shared successes – thanks to performance-defining components made by HOERBIGER.

Consistent with the automotive focus, we are presenting to you in this issue the new Alfa Romeo Giulietta developed in Italy as well as a newcomer from China, the Qoros 3 Sedan.

Another report is dedicated to our customer LOJER OY from Finland. The family business has been a successful manufacturer of operating tables worldwide for approximately 30 years.

HORIZON is the third new category. It is primarily centered around our innovative products and HOERBIGER service models. In the SPIRIT category, you meet the people who are committed to making our success and performance possible.

We are showcasing the long-term benefit of the HOERBIGER REE audit based on the example of Kuwait National Petroleum Company (KNPC). REE stands for reliability, efficiency and environmental soundness – key requirements of the operators of reciprocating compressors in the process industry.

As a first, HOERBIGER@MOTION will be available to you on our website as an electronic magazine (e-paper). This is also part of our new concept.

With our customer magazine, we want to continue to offer you exciting reading on up-to-date topics – in a form that brings our industry partners, our company and the performance of the people of HOERBIGER alive for you, our readers, even more so than in the past.

You can help us further optimize HOERBIGER@MOTION. At www.hoerbiger.com/motion you have the option of sending us your feedback – or just simply use the QR code below.

Dr. Martin Komischke
CEO and Chairman of the Executive Board
HOERBIGER Holding AG
FEATURE: THE FUTURE OF THE AUTOMOBILE

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HOERBIGER CompactLINE
PRACTICAL TESTING

On December 5, 2013, during the 12th International CTI Symposium in Berlin, Germany, a test day was held on the premises of the ADAC Driving Safety Center Berlin-Brandenburg. All participants at the event had the opportunity to test the innovations presented at the symposium under real-life conditions. The HOERBIGER CompactLINE test vehicle was well-received by the industry professionals. Eighteen vehicles featuring various drive train concepts were available for test drives. HOERBIGER provided a VW Golf demo vehicle equipped with the new CompactLINE synchronizer in the third and fourth gears. Before the drivers started off, employees from HOERBIGER Antriebstechnik GmbH explained the benefits of the CompactLINE over conventional synchronizers.

After the test drive, which included all kinds of roadway situations – up hill, down hill with curves, longer straight sections and curve combinations – the test drivers were asked for their expert opinions about the shift quality. All testers across the board reported excellent shifting behavior, emphasizing that the third and fourth gears with conventional synchronizers.

PRACTICAL TESTING

HOERBIGER ACQUIRES TURBOTECH ENGENHARIA LTDA

The HOERBIGER Group acquired TurboTech Engenharia Ltda, Salvador da Bahia, Brazil, effective January 1, 2014. The privately held engineering firm specializes in providing maintenance, overhaul and monitoring services for turbomachinery.

HOERBIGER will retain TurboTech’s staff and will operate the company under the umbrella of HOERBIGER Service Latin America, Inc. (HSLA) in the Strategic Business Unit Compression Technology. The acquisition follows several years of successful collaboration on major turbomachinery overhaul projects in Latin America. With this acquisition, HOERBIGER continues to strengthen its current product and service portfolio to include maintenance and overhaul services for turbomachinery.

AVA DIGITAL AWARDS
FOR THE HOERBIGER WEBSITE

The new HOERBIGER website has also met the taste of North America’s marketing specialists: on January 31, 2014, www.hoerbiger.com was recognized at AVA Digital Awards with both Platinum and Gold. AVA Digital Awards recognizes excellence in planning, concept, design and production of digital communication. There were approximately 2,100 entries in 2014: about 14 percent won the Platinum Award, 16 percent were Gold winners, and 7 percent won Honorable mention. HOERBIGER scored successfully in two categories in this year’s competition: the new corporate website received the Platinum Award in the Business to Business category and was a Gold winner in the Manufacturing category. AVA Digital Awards is truly a U.S. awards program: only nine Platinum winners are not from the North American continent. HOERBIGER is the sole award winner from Central Europe.

HOERBIGER RECEIVES THE SANDEN SUPPLIER AWARD

Gala Precision Technology Private Limited located in Thane, India, is an entity of the Serial Compressor Business Segment in the Strategic Business Unit Compression Technology. In February 2014 the company was presented with the SANDEN Supplier Award in Tokyo for outstanding performance. “During the past fiscal year, HOERBIGER demonstrated that it can consistently supply products and components that meet or even exceed the expectations of SANDEN in terms of quality, price and on-time delivery,” SANDEN commented on its decision.

SANDEN Corporation, an international technology group headquartered in Japan, manufactures among others retail store systems and cooling systems for air conditioners used in passenger cars. HOERBIGER supplies SANDEN with valves and valve plates for fully hermetic compressors.

HOERBIGER LiftAX HYDRAULIC ACTUATOR – DECENTRALIZED POWERHOUSE REDUCED TO ESSENTIALS

HOERBIGER LiftAX focuses on decentralized, compact fluid units that are versatile in their use. For the users in the machinery industry, this means added design freedom through the elimination of central hydraulic power packs, oil lines and potential leakage spots. And this additional benefit does not come at the expense of power, speed, precision and application diversity.

One example of a customized application that was cost-effectively assembled from the HOERBIGER modular system of standard components is the HOERBIGER LiftAX system. It automates the handling of metal panels on flat-bed laser cutting machines using decentralized hydraulic actuators. The remote self-sufficient LiftAX units at the corners of the pallet table ensure minimal installation effort and maximum convenience.
CURRENT VEHICLES

FEATURING HOERBIGER DRIVE TECHNOLOGY

GAZelle

GAZelle Next is the third generation of the all-purpose workhorse coming from Nizhny Novgorod, Russia. Built by Gorkovsky Avtomobilny Zavod (GAZ, Gorky Automobile Plant), the light truck is available in a number of platform variants. Whether used as a flatbed truck, panel van, school bus, refrigerated transporter or ambulance, GAZelle is the market leader in Russia among light commercial vehicles. And thanks to its robust design, it is also enjoying growing popularity in other markets.

More than 1.5 million vehicles have been produced so far. Initially, the GAZelle Next will only be offered with a four-cylinder turbo-diesel engine made by Cummins. Other gasoline and gas-powered engines will be added over the course of 2014. In the GAZelle Next family, models with a gross vehicle weight ranging from 2.8 tons to 5 tons will be manufactured. In the future, a selection of more than 100 types of specialty vehicles will be available. GAZ draws on entire synchronizer systems made by HOERBIGER for the in-house-manufactured transmission.

OPEL CASCADA

Following the Mokka, a compact SUV, the Cascada is another building block in Opel’s multi-billion euro product offensive: the midsized convertible offers luxury, elegance and excellent handling at an attractive price. The Cascada will therefore be able to reach customers in segments in which Opel previously was not active.

The Cascada offers a broad powertrain line-up. The base gasoline turbo is available with output of 103 kW/140 hp. It is joined by a turbo diesel with 121 kW/165 hp as well as the all-new 1.6 ECOTEC® Direct Injection Turbo engine, which is now available with outputs of 125 kW/170 hp and 147 kW/200 hp and is distinguished by pleasant running smoothness and high power output with economical fuel consumption. All engine size variants come standard with a six-speed manual transmission, for which HOERBIGER supplies the friction systems.

CHANG’AN RAETON AND CS75

Employing a staff of approximately 50,000, Chang’an achieved annual production of over two million vehicles in 2013, making the company one of China’s top four automakers. While the Central Chinese firm had long been only a commissioned producer and joint venture partner for Japanese and European brands, it is now going to market with models of its own. Chang’an unveiled six unique models at the 2013 IAA, among them the Raeton, a mid-range sedan. HOERBIGER supplies complete synchronizer systems for the MF626 transmission made in-house, which is used in the Raeton and the CS75.
Predicting the future of the automobile is tempting – yet also a bet with many variables. Innovations, new technologies and perceived trends may seemingly set the direction, but how many future scenarios of the automobile have not materialized? Still, we venture a look into the automotive crystal ball.
believe in the horse. The automobile is only a temporary phenomenon.” With this comment in the early years of the 20th century, none other than German Emperor Wilhelm II placed himself at the forefront of the automobile skeptics. It was a misjudgment. Still, even engineers and inventors who were looking to the future of the automobile more optimistically had a difficult time making forecasts. Gottlieb Daimler considered a maximum number of two million automobiles worldwide to be the growth limit. His reasoning: that’s all the chauffeurs that were available.

Today, more than 70 million passenger cars are manufactured annually worldwide, and this trend is likely to continue. The automobile is still relatively inexpensive to acquire, and it is versatile, flexible and easy to operate, which is why it remains an essential element for the mobility of people. Time and again, the car industry has fought against the predicted demise with its ingenuity, offering more safety engineering, exhaust gas catalytic converters and environmentally friendly emissions values, and massive fuel consumption savings.

What’s next? Will we all drive electrically someday? Will the automobile revert to a luxury item, while passengers are transported according to the pneumatic tube principle in underground tunnels at the speed of sound – as Tesla CEO Elon Musk recently proposed with the Hyperloop concept?

**PLURALITY OF PROPULSION TYPES**

Here is a mental exercise: let’s imagine that gasoline and diesel were not yet long established as conventional fuels, but that they would have to go through the process of obtaining authorization for operation. Things arguably wouldn’t look good for the approval of such an explosive and easily combustible mixture. And understandably not too many energy companies would be willing to invest in the construction of a wide-spread filling station network. Even nations and municipalities would approach the expansion of the road infrastructure rather slowly. Under these conditions, automobiles could be produced only in small quantities, and it would cost a small fortune.

This mental exercise illustrates that there is more to it than finding an alternative fuel to operate vehicles. It is crucially important for the automobile and infrastructure, energy supply and industrial economies of scale to be synergistic – otherwise, there is no automotive mass mobility.

The interaction based on the internal combustion engine that has evolved over a century and is well established today cannot be “duplicated” within a short amount of time.

Model at the Fraunhofer Institute: the synergy of the automobile and infrastructure is crucial.

**WHAT’S NEXT? WILL WE ALL DRIVE ELECTRICALLY SOMEDAY?**

This is the problem with every new propulsion type, whether it involves e-mobility with batteries, fuel cells, or hydrogen. Establishing a new automotive infrastructure with public charging stations will still take some time. If one were to succeed in improving the fuel efficiency of only half of the above-mentioned 70 million new vehicles driven by gasoline or diesel through hybrid technology, downsized engines, lightweight construction, more aerodynamic car bodies or less rolling drag, we would have accomplished more than by the introduction of even a substantial fleet of all-electric vehicles.

The question of electric vehicles in any case remains that of sustainable power generation. For example, if the concern is about climate-friendly reduction of CO₂ emissions, electricity from regenerative energy sources has no effect on the eco-balance whatsoever. The proportion of regenerative energy in overall energy consumption remains too low.

In the long run, a plurality of propulsion types is a likely scenario. Agile electric cars will be the norm for city driving, and the internal combustion engine will be the optimum solution for local or long-distance driving, at least for the time being.

**INTERMODALITY INSTEAD OF TRAFFIC JAMS**

Speaking of “zipping around town”: things are generally not quite so fast – regardless of whether you are going conventional or electric. Traffic jams are taking on extreme dimensions even today, especially in and around megacities.

São Paulo, Brazil’s metropolis that millions call home, has daily congestion up to 100 miles long. New traffic concepts are what is needed, and above all individual mobility and public transportation must be better linked. Intermodality – the (fast) change between modes of transportation – is the magic word.

This approach is not only about more park-and-ride spaces in the vicinity of large cities. A completely different understanding of automobile use is on the horizon – such as intelligent car
Car sharing platform, concept car: Mobile communication creates new traffic concepts.

sharing. Mobile communication creates further opportunities: the wealth of movement profiles – with or without a car – allows traffic concepts to be customized for any city. It is no accident that, in addition to automobile groups, IT companies play a decisive role when it comes to car sharing.

There is another reason behind the keen interest of the IT giants from Silicon Valley in the automobile: cars are network-capable, data-producing computers on wheels. The key is to devise software that creates new value from these data. Imagine the market opportunities for automobiles that are not only available for rental via the Internet and for car sharing in every city, but that also adapt to the driver’s preferences stored on the network while driving, link to other vehicles, issue warnings regarding hazards and traffic jams, and offer the driver the best route to the destination.

EFFICIENCY AND INCREASED PERFORMANCE
No worries – the established automakers and their suppliers will not have IT giants overtake them any time soon.

The goal of the automobile industry and suppliers is to further increase the efficiency of the automobile in the coming years, and they have access to the performance-defining systems of the vehicle: the engine and the drive train. It is here that they can achieve considerably more in terms of efficiency, increased performance and comfort than with IT and networking, namely fuel savings through engineering know-how, electronics, and software.

In the engine, intelligent electronics will allow significantly greater efficiency in the coming years.

In the drive train, sophisticated synchronizer and friction systems that are tailored to the respective need will open up additional performance potential for the conventional vehicle drive system.

MOBILITY WITH ADDED VALUE
We are well advised to not imagine the automotive world of the future with too many futuristic notions. In terms of our mobility, we will soon be considerably more efficient than now. In the foreseeable future, cars will offer their users – and increasingly also lessees instead of owners – considerably greater added value on their way from A to B.

The automobiles of the future will be integrated into modern and efficient traffic concepts. And for quite some time to come they will have a presumably very fuel-efficient internal combustion engine and a highly efficient transmission.

Demands on automakers and suppliers are becoming tougher: the trend is for vehicles to be ever-more fuel efficient and emit even less CO₂ for a low impact on both the environment and wallets. Climate-neutral mobility – that’s the ambitious goal of the German automotive industry. As a result, our sector continues to innovate at increasing speed, pursuing a two-pronged strategy on the one hand, it is striving for alternatives to the internal combustion engine that offer extremely low CO₂ emissions; and on the other hand, plans call for making conventional engines even more efficient.

Germany’s automobile industry is investing billions to further lower CO₂ emissions as well as the fuel consumption of new vehicles. Still, the industry has to strike a balance between ecology and economy. The European CO₂ regulation proposed for 2020 presents Europe’s automotive industry with daunting challenges. At 95 grams of CO₂ per kilometer, Europe is pursuing the most stringent target worldwide by far. The figure in the USA is only 121 grams by 2020, and 117 and 105 grams for China and Japan, respectively. Emission of 95 grams equates to fuel consumption of almost 60 miles per gallon (just under 4 liters per 100 kilometers). This goal aims for a reduction of 35 grams between 2015 and 2020 – and it is extremely challenging and out of reach based on traditional engine technology alone. Policy makers in Europe must not lose sight of the equilibrium between climate protection and sensible industrial policies.

A changing world poses new challenges for tomorrow’s mobility. Two-thirds of mankind will live in cities by the end of the next decade. Technologies for urban mobility are what we need, which naturally also encompasses the ramp-up of electromobility. German manufacturers alone will launch 16 production models equipped with electric motors by the end of 2014. Ultimately, it is still the customer who decides – the advantages of electromobility must be compelling for buyers of new cars. The realm of politics must contribute its part to make electromobility a convincing alternative for many people.

IN LIGHT OF THE GREAT CHALLENGES THAT THE AUTOMOBILE INDUSTRY IS FACED WITH, INNOVATIONS ARE MORE IMPORTANT THAN EVER.

Matthias Wissmann, President of the German Association of the Automotive Industry.

In the future, multiple drive systems will coexist. Which one is best suited will depend on the particular location and purpose. Universally applicable gasoline and diesel engines will undoubtedly be around for some time to come, with alternative drives increasingly gaining a foothold in urban regions. Initially, the all-electric vehicle will be encountered predominantly in the metropolitan areas around the globe.

In light of the great challenges that the automobile industry is faced with, innovations are more important than ever – both for growth and employment, and to protect international competition. Both are indispensable to attain above-average and lasting success – especially during economically difficult times. German manufacturers and suppliers are doing their utmost to ensure that individual mobility and climate protection continue to be compatible.
Since 2009, the HOERBIGER Strategic Business Unit Drive Technology has consistently focused its business activity on the development and production of synchronizer systems for manual and double-clutch transmissions used in passenger cars. The Strategic Business Unit plans to strengthen its role as a globally leading, independent manufacturer of complete synchronizers in the coming years through innovations for new market fields.

Text: Simon Schmid  Photography: Corbis, picture alliance/dpa
When you look at the different models of two-pedal cars – meaning vehicles without the clutch pedal – the torque converter automatic transmission, CVT and double-clutch transmission are competing with each other. However, one physical fact remains: no automatic transmission system can be designed better than a manual transmissions in terms of efficiency. This has prompted many up-and-coming Chinese manufacturers to focus on the double-clutch transmission.

This transmission combines the efficiency of manual transmissions with automatic gear shifts with no loss of traction. Since the driver no longer personally shifts in the case of double-clutch transmissions, the requirements in regard to the synchronizer also change. Unlike a human driver, a shifting actuator is not concerned with how comfortably a gear can be engaged. Conversely, performance is gaining in importance for sporty shifting across multiple gears. Our latest advanced engineering projects take the particular demands on double-clutch technology into account. The main area of our development work in manual transmissions – that is, greater synchronizer capacity on a smaller installation space – is already bearing fruit with the CompactLINE.”

Dr. Ansgar Damm,
Head of Research and Development
HOERBIGER Antriebstechnik Holding GmbH.

FRICION SYSTEMS FOR ANY REQUIREMENT

Powerful friction systems are the prerequisite for a functionally sophisticated complete synchronizer system. Here, HOERBIGER goes in a different direction when it comes to transmission technology. After all, there is one factor that, while necessary for successful synchronization, transmission developers on the customer’s side try to avoid under all circumstances: friction. This makes friction linings that also work with modern low-viscosity oils all the more important.

At the same time, the friction lining must not be chemically corroded by additives in the transmission fluid. Corrosive sulfur compounds are still being used, especially in emerging automotive countries where the development of transmission oils is not as advanced. HOERBIGER has therefore added carbon friction linings to its portfolio. The organic linings are considerably more resistant to environmental factors than metal friction linings. Compared to conventional brass friction linings, carbon also enables extremely smooth shifting, even at low temperatures.

The HOERBIGER HC300 carbon friction lining was optimized in particular for high durability and the use of modern low-viscosity transmission fluids. Its formulation makes the HC300 the benchmark for shifting comfort and robustness. It allows modern manual and double-clutch transmissions to reach their full potential.

Vehicle sales will continue to grow globally. Key market impetus will come from Asia in the future where conventionally driven, affordable vehicles are in demand to mobilize the populace. Increasing hybridization of the drive train in the premium segment will be contrasted with disproportionate growth of the low-price segments using conventional manual or double-clutch transmissions.

As a result, HOERBIGER’s development projects go beyond pursuing the goal of offering the best solution in the market in terms of function by also looking for ways to systematically lower costs. The latest examples are our new CompactLINE synchronizer and the Blocker Ring Evolution (BRE). They offer outstanding performance while contributing to cost reduction, an essential topic in the automobile industry.”

Dagobert Wagner, Head of Innovation Management and Product Development, HOERBIGER Antriebstechnik Holding GmbH.
CompactLINE
SYNCHRONIZER REINVENTED

It constitutes a technical revolution inside the transmission: with the CompactLINE, HOERBIGER has reinvented the synchronizer. The product is in sync with the times, offering best-in-class shifting comfort, robustness, a small footprint and cost-effective production. Its compact design is especially important for modern downsizing concepts.

Occasionally automobile magazines make mention of the difficulty of shifting early manual transmissions – a subject most young readers probably wouldn’t relate to. Approximately fifty years ago, shifting gears in the automobile tended to require a lot of effort. After disengaging the clutch, drivers had to match the different rotational speeds of the gear wheels in the transmission by blipping the throttle – and they had to do this by feel and with varying levels of intensity for every gear shift.

The widespread success of synchronizers has considerably facilitated things. Synchronizers – put in somewhat simplified terms – are sliding mechanisms on the transmission shaft that the driver actuates by moving the gear shift lever as a gear is engaged. Conically arranged friction surfaces at the synchronizer rings ensure that the different rotational speeds of the shaft and gear wheels are automatically matched to each other. All of this happens very quickly and is extremely convenient for drivers.

BEST-COST SYNCHRONIZER PROJECT

Over the past decades, the principle of synchronizers has been incrementally advanced and optimized – also by HOERBIGER. Objectives included the configuration for various engine torque, faster and more comfortable gear shifts, and simpler – that is more cost-effective – production in large volumes. The latter was primarily expedited by HOERBIGER, which increasingly utilized metal-forming technology instead of forged or sintered parts. The pace was set in no small part by the automakers and transmission manufacturers as a result of modified engine technology, lightweight construction and efficiency increases. The speed at which changes occur has increased yet again in recent times. Fuel-efficient downsized engines featuring fewer cylinders introduce more “turbulence” in the drive train. At the same time, manual transmissions are being designed with an ever-greater number of shiftable gears, prompting the number of synchronizers used to rise as well. Six and even seven speeds are no longer a rarity, given that a wider transmission ratio range positively impacts fuel consumption as well. Additional transmission types such as double-clutch transmissions and automated manual transmissions (AMTs), which also require synchronizers, have become firmly established around the globe.

The HOERBIGER CompactLINE is made almost entirely of formed metal parts. The solid sliding sleeve found in traditional synchronizer concepts is eliminated.
“The conventional synchronizer principle, originally intro-
duced by Borg Warner, has reached its design limits of late,”
comments Peter Echtler, Head of Advanced Engineering,
HOERBIGER Antriebstechnik GmbH. “We had little room
left for optimization on this basis. To be able to transmit a
defined torque, a particular minimum size had to be met.
Additionally, we had largely pushed the envelope in terms of
cost reductions through the use of metal-formed parts.” Five
years ago, the idea of entirely rethinking the synchronizer
was raised. Echtler and his team of developers started with a
clean sheet: “We questioned practically everything. Only the
installation space and the functionalities we wanted were set,”
says Georg Ruprecht, Project Leader, HOERBIGER Antrieb-
technik GmbH. In the process, HOERBIGER benefited from
a principle that, while previously known, had not been imple-
mented on an industrial scale. The outer cone synchronizer
especially makes a greater friction surface possible, and
consequently faster synchronization, even with higher torque.
The HOERBIGER team continued to develop this principle –
keeping not only what happens in the transmission in mind,
but also HOERBIGER-compliant producibility. “One of our
targets was to come up with a markedly higher proportion of
components that used cost-effective metal-forming tech-
nology,” Echtler recalls. The working title of the project
group, Best-Cost Synchronizer, made this priority clear.

CompactLINE ABOUT TO BE LAUNCHED

Almost 100 percent of the new product, which bears the
name CompactLINE and is about to be launched in series
production, can be implemented with sheet-metal-forming
technology. The solid sliding sleeve found in traditional syn-
chronizer concepts is eliminated, lowering material and pro-
cessing costs. The new design approach has a number of oth-
er advantages. Cooling is more efficient, making CompactLINE
extremely robust and durable in its application segment. In
addition, the weight and size were reduced over the conven-
tional synchronizer. And even though the HOERBIGER inven-
tion constitutes a technical revolution, it does not necessitate
changing the entire transmission architecture: “All our custom-
ers have to do is adapt the interfaces. Otherwise, CompactLINE
can be used in the manual, automated or double-clutch trans-
missions that are common today,” adds Echtler. The Compact-
LINE is about to be launched for series development as a size
M single cone and is suitable for small transmissions with up
to 200 Newton meter input torque. HOERBIGER will also
develop CompactLINE in other sizes in the near future. The
interest level among customers is enormous even now.

“ONE OF OUR TARGETS WAS TO COME
UP WITH A MARKEDLY HIGHER
PROPORTION OF COMPONENTS
THAT USED COST-EFFECTIVE
METAL-FORMING TECHNOLOGY.”
Peter Echtler

Effective March 1, 2014, Thomas Englmann took over management of
the Strategic Business Unit Drive Technology from Dr. Siegmar Schlagau.
HOERBIGER@MOTION introduces the new man at the helm.

Interview: Axel Kühn  Photography: Manfred Klimek
Mr. Englmann, you assumed managerial responsibility for the strategic Business Unit Drive Technology on March 1. Will this be a special day for you?

It was a great day, because the management position I assumed is indeed very attractive. Being able to advance a successful Business Unit in a highly dynamic industry, and aligning it with a long-term view for entirely new challenges that we will face in the automotive business – that’s a tremendous opportunity. I was able to see this for myself over the past six months while working closely with Dr. Schlagau and the management team before officially assuming the position. This ensured a smooth transition and I was able to assume management responsibility step by step. Dr. Schlagau’s active support has allowed me to become involved in all areas beyond my existing area of responsibility of Market and Technology.

You have already participated in numerous customer projects in the past months. What are the most important insights you take away?

The prevailing mood among our customers is positive. They see many opportunities in the global markets and allow us to play a role in them. I think that we are becoming ever more successful at continually increasing our customer focus – also in a way that is perceptible for customers.

We will make it even clearer to our customers that HOERBIGER not only offers excellent products, but that we can also make an important contribution to their value as a strategic development and delivery partner. It’s very important to me that our customers know they can rely on HOERBIGER to be an innovative, global and competitive partner.

What does this mean for the strategic Business Unit Drive Technology?

By focusing on the Synchronizer Business Segment, my predecessor Dr. Siegmund Schlagau has put important and correct mechanisms in place. This is apparent from the successful trend of the past years. I will continue to focus on this basic strategic orientation. Our customers expect us to decisively contribute to their success with peak performance. After all, we claim to be the number one in the market as a system provider for synchronizers. We will have to prove this day in and day out going forward. And we will. The signs definitely point to innovation and growth for the Strategic Business Unit Drive Technology.

So there will be no revolution, but rather a systematic evolutionary development?

You could put it that way. Our customers today are more cost-driven than ever. At the same time, innovations are a must. You could put it that way. Our customers today are more cost-driven than ever. At the same time, innovations are a must. Our customers expect us to decisively contribute to their success with peak performance. After all, we claim to be the number one in the market as a system provider for synchronizers. We will have to prove this day in and day out going forward. And we will. The signs definitely point to innovation and growth for the Strategic Business Unit Drive Technology.

Isn’t it ultimately only the prices that determine success in the automotive business?

I think tying everything to price would be missing the mark. My experience has shown that there are three key factors that decide on a company’s success: innovation, people and continuous improvement. Our industry changes so rapidly that innovative products which time and again create a competitive advantage for customers are essential. This, in turn, is only possible when a company has highly competent and dedicated employees – people who are prepared to deliver top performance every day to achieve a leading position in the market. And the daily willingness to become better matters – from productivity to quality to flexibility. Always maintaining a clear view of our customers’ development cycles. Nonetheless, better technology today does not automatically also imply higher prices. This is something we have long adapted to. Our goal is to enable added functions at lower costs. The entire Business Unit will therefore systematically work on improving our value creation, such as through professional global purchasing, optimized internal production flows, standardized global processes and much more.

The industry is fundamentally in motion. That said, let’s talk about the catchword e-mobility. How will the strategic Business Unit Drive Technology position itself for the long term?

HOERBIGER is synonymous with innovative strength in all Strategic Business Units. Economically and structurally, we are excellently prepared and have an outstanding starting position. From this, we have all sorts of opportunities to develop entirely new ideas and initiate concepts that will represent our business for tomorrow. Rest assured that we will take advantage of this opportunity. And when the time has come, I will gladly talk about it in more detail. Transmissions will remain our core business for the foreseeable future, and we will continue to set standards.

A demanding business, a highly competitive industry, huge responsibility and certainly also a ton of work, is it nonetheless your dream job?

Not too long ago, I would have answered that my dream job is either being the pope or the CEO of Germany’s Bayern Munich soccer club. But when I take a look at the recent developments in these two offices, I think that what I ended up with isn’t so bad. I look forward to this new responsibility.

I like HOERBIGER, I like the people of HOERBIGER, and I like the automotive business. I was given an extraordinarily friendly welcome everywhere in the Business Unit Drive Technology. I have already had good technical discussions with many competent, dedicated colleagues on interesting details. I’m finding that people are interacting very pleasantly with each other. To me, this is the HOERBIGER culture: I have come to know and value for many years. This is always maintaining a clear view of our customers’ development cycles. Nonetheless, better technology today does not automatically also imply higher prices. This is something we have long adjusted to. Our goal is to enable added functions at lower costs. The entire Business Unit will therefore systematically work on improving our value creation, such as through professional global purchasing, optimized internal production flows, standardized global processes and much more.

The prevailing mood among our customers is positive. They see many opportunities in the global markets and allow us to play a role in them. To me, this is the HOERBIGER culture: I have come to know and value for many years. This is an important insight that I take away.
THE NEW BRAND FROM THE MIDDLE KINGDOM

Qoros builds cars with a high standard of quality

Debut in China: for the first time a vehicle will roll off the assembly line which was not only designed based on Western quality standards, but that also launches a new automobile brand – Qoros. With its midsized 3 Sedan, Qoros initially plans to conquer the Chinese market. In a next step, the company is setting its sights on the markets in South Asia, Europe, the United States and South America.

When it comes to design, Qoros focuses on clean lines and timeless elegance. The same applies to the cockpit, which has been reduced to its essentials to ensure ease of operation. The large screen is a standard feature.

Text: Michael Specht  Photography: Qoros
Qoros Automotive Co., Ltd. was founded in December 2007 as a 50/50 joint venture between Chinese automobile manufacturer Chery Automobile and Israel Corporation, one of the most powerful strategic investors in Israel.

Qoros constructed a modern manufacturing plant in Changshu in Jiangsu Province. The factory not only stands out because of high processing quality and efficiency, but also due to its compliance with the most stringent environmental standards. The initial manufacturing capacity in a two-shift operation will be 150,000 vehicles annually, and capacity can be expanded to twice this volume if needed. The opening ceremony for the new automotive location was held at the end of 2011. At present, Qoros has approximately 2,000 employees and operates engineering centers in Shanghai, Munich, Germany, and Graz, Austria.

The company recruited internationally renowned managers to develop the vehicle models and establish the brand. Former VW executive Volker Steinwascher, now sharing the top leadership at Qoros together with Guo Qian, previously managed Volkswagen of America. Prior to that, Steinwascher was in charge of establishing a VW engine plant. Gert-Volker Hildebrand is responsible for styling. Hildebrand formerly served as design chief in BMW’s Mini division. Peter Matkin formerly worked for Jaguar Land Rover and now heads up the engineering development department of Qoros. Klaus Schmidt, who previously was with BMW’s M GmbH, has overall vehicle responsibility. And former Opel employee Ralf Nicklas is in charge of quality management.

Qoros also wants to be on par with the renowned automotive brands in terms of driving dynamics. Two gasoline engines will initially be available for the market launch. A diesel is scheduled to follow for Europe.

The 3 Sedan notchback measuring 15 feet 2 inches (4.61 meters) long is the first vehicle of a range of models Qoros plans to continually expand in the coming months and years. Qoros’ managers deliberately decided in favor of a notchback sedan because this is one of the top-selling categories in China. Qoros is also convinced that many Chinese would like to purchase a Chinese car, but only if the overall quality was comparable to the level achieved by prestigious imported vehicles. “We are the only Chinese manufacturer who offers this,” says Volker Steinwascher.

The notchback sedan is entirely based on newly developed and modular architecture. With this, Qoros is laying the foundation for high flexibility at low production costs. At present, a number of other vehicles are in the development pipeline. New models are scheduled to roll off the line every six to twelve months. Qoros unveiled a five-door hatchback sedan at the Geneva Motor Show in March 2014. A hatchback model in the form of a crossover, an off-road vehicle, and a station wagon specifically tailored to the European market are also under development.

MEETING THE DESIGN CHALLENGE

Chief designer Gert-Volker Hildebrand was tasked with drafting not only a new model, but one that fits an international brand. “Qoros employs simple aesthetics, applying traditional German Bauhaus concepts. This is intended to exude value and convey quality through well-balanced proportions,” says Hildebrand. His team, consisting in total of more than 50 employees (designers, modelers, technicians and materials experts), relies on clearly defined, simplified and timeless optics. Fashionable swage lines and curves in the body are consciously dispensed with. A long wheelbase and short bodywork overhangs are sure to provide a solid presence.

The Qoros 3 Sedan conveys an equally clean and clearly structured appearance in the cockpit. With this, Qoros is laying the foundation for high flexibility at low production costs. At present, a number of other vehicles are in the development pipeline. New models are scheduled to roll off the line every six to twelve months. Qoros unveiled a five-door hatchback sedan at the Geneva Motor Show in March 2014. A hatchback model in the form of a crossover, an off-road vehicle, and a station wagon specifically tailored to the European market are also under development.
DRIVE

HOERBIGER@MOTION

DRIVE

considers this to be an important USP since it is focusing primarily on young, urban customers, who are accustomed to using the latest computers, tablets and Internet services. In the Qoros 3 Sedan, for example, entertainment data is not on hardware in the car but stored on cloud servers. QorosQloud already covers China, and Europe will be added at some time down the road. “We feel that we have the most user-friendly and clever system that is presently being offered in the automotive industry,” states company spokesman Eric Geers.

SYSTEMATICALLY GEARED TOWARD WESTERN STANDARDS

Just how serious Qoros is about its statement “according to Western standards” becomes evident in the vehicles’ safety. While a few years ago crash tests caused Chinese car-makers such as Landwind and Brilliance to miserably fail in their attempt to establish their vehicles in Europe, Qoros shines with top ratings. Last year, the Qoros 3 Sedan achieved an overall score of 88 percent and became the first Chinese car to be awarded the maximum of five stars in the Euro NCAP crash test. This rating also secured the Qoros 3 Sedan the accolade as Best in Class Car of the year, and the car even achieved the highest results of all vehicles tested in 2013. “The Euro NCAP results underscore the high level of design, engineering and production quality we have achieved with the Qoros 3 Sedan. To be able to satisfy these challenging, world-class standards was a goal that our company pursued from the very start,” comments CEO Volker Steinwascher.

At the time of market launch, Qoros customers will be able to choose between two 1.6-liter gasoline engines, which can be combined with either a manual six-speed transmission or a six-speed double-clutch automatic transmission. Both Qoros drivers always remain connected to their car by smart phone. All the vehicle’s entertainment runs via the QorosCloud and no longer has to be stored on board.

In the Euro NCAP crash test, the Qoros 3 Sedan was not only the first Chinese car to be awarded the maximum of five stars, it also achieved the highest results of all vehicles tested in 2013.

In the Euro NCAP crash test, the Qoros 3 Sedan was not only the first Chinese car to be awarded the maximum of five stars, it also achieved the highest results of all vehicles tested in 2013.

The synchronizers important for optimal shifting are in each case made by HOERBIGER – from production operations in Oberstenfeld, Germany, and Changzhou, China. Getrag is using complete systems from HOERBIGER. They set standards in wear resistance and shifting comfort. The synchronizer systems were designed to ensure quiet, fast and reliable shifting under all operating conditions — consistently over the entire life of the vehicle.

Better shifting: the synchronizers for the Getrag transmissions in the Qoros are made by HOERBIGER.

At the end of last year in Shanghai, Qoros inaugurated its first showroom. The architecture and appearance will serve as a blueprint for the brand.

Better shifting: the synchronizers for the Getrag transmissions in the Qoros are made by HOERBIGER.
ITALIAN TEMPERAMENT

Alfa Romeo Giulietta 1.4 Turbo MultiAir TCT

It’s my first date with an Italian in decades. I remember Grandmother Giulietta, with her sleek Bertone lines that can still enchant today. And I recall passionate episodes with edgy Aunt Giulia and her hot-blooded sister Giulia Sprint GT – all of them legends. Admittedly, that was a long time ago. But nothing makes a greater impression than the passion of one’s early years.

Text: Peter Weidenhammer Photography: Markus Meienberg

... WITH HIDDEN CHARMS
The fancy front end gives the Giulietta high brand recognition.

Finger on the trigger: Giulietta’s driving dynamics can be influenced with the D.N.A. program.

HOERBIGER is the exclusive supplier of the synchronizer systems.

Author Peter Weidenhammer tested the Giulietta in the Swiss Canton of Zug.

In 1954, Grandmother Giulietta wore for the first time the legendary 1.3 liter all-aluminum engine with two overhead camshafts under her shapely hood – back then purebred racing technology.

Ifa Romeo – the name brings back the sound of a robust dual-camshaft engine and the scent of uncatalyzed exhaust. And not to forget the images of the merciless Technical Inspection Association (TÜV) inspectors with rust-colored screwdrivers poking around in the innards of the bella macchina.

In 2013, it’s a different story with the Giulietta. The brand-new Alfa Romeo Giulietta 1.4 Turbo MultiAir looks good in black. Compact dimensions spiced with the typical Alfa dash of extravagance. Impeccable seats.

I turn the key, glowing red symbols and numbers light up before me. Giulietta awakens. The four-cylinder engine comes to life quietly and makes a refined impression. Responding to the gas pedal, the needle skips lightly across the tachometer.

Character matters

Yet Alfa has not lost its not-quite-perfect charm. The rear-view mirror shakes in the 1500 RPM range. I love cars with character. And especially this one, since I know the source of this nervousness is engine technology at its best.

Giulietta’s heart throbs with the typical beat of four cylinders that share the 1.4 liters of piston displacement. Small engines with high performance were always the trademark of these Italian beauties. In 1954, Grandmother Giulietta wore for the first time the legendary 1.3 liter all-aluminum engine with two overhead camshafts under her shapely hood – back then purebred racing technology.

Her grandchild can keep up with that. Thanks to turbocharging, 170 hp can be squeezed out of the engine, yielding a power-weight ratio of 8.15 kg/hp. That’s plenty of power.

The modern Giulietta offers a considerable difference between performance and consumption: 170 hp for 5.2 liters of premium gasoline per 100 km according to the Euro norm. Not bad.
TECHNICAL INFORMATION: ALFA ROMEO GIULIETTA 1.4 TURBO MULTI AIR WITH TCT

• Four cylinder turbocharged engine with 1368 cm³ displacement and intake-side MultiAir valve control
• Rated output: 170 hp (125 kW) at 5500 RPM
• Six-speed twin-clutch transmission (TCT) with two dry clutches
• Acceleration 0–100 km/h in 7.7 seconds
• Maximum speed: 218 km/h
• Total fuel consumption in NEDC (New European Driving Cycle) is 5.2 l/100 km
• For the TCT, HOERBIGER supplies four hub systems, five multi-cone synchronizers and two single-cone rings.

HIDDEN CHARMS

However, I think my fuel consumption today will be quite a bit more. Not so much because I have a copilot who raises the power-weight-ratio. More because this young Giulietta has hidden charms that want to be enjoyed. And Ottmar Back isn’t entirely blameless here.

Ottmar Back is the proven expert in transmission synchronizers in HOERBIGER’s Strategic Business Unit Drive Technology, and one of those engineers whom I deeply respect. They juggle shafts and gears, shifter forks and friction disks. In principle, their workings are common knowledge.

But with about 150 components – some of which themselves consist of subassemblies – that have to be designed to function together, you need one of the best watchmakers in automotive engineering.

TCT – GIULIETTA’S NEW TRANSMISSION

Hidden deep in the engine compartment, Giulietta guards an ultra-modern gearbox. Alfa Romeo calls it TCT, the initials of its RPM range it has a strong voice. Giulietta snarls when you let go of the reins.

The speed lies in the nature of this transmission. And that is the reason for its development. The goal: fastest shifting without interrupting traction. The path: splitting into two partial transmissions, each with its own clutch. The idea behind this is that to shift the partial transmissions are alternated. One clutch opens while the other simultaneously engages. The result: maximum shifting speed, no loss of traction. Goal achieved.

In principle the individual gears are selected via shifter forks just as with a mechanical manual transmission. With the TCT, this is performed electrohydraulically. One partial transmission comprises the even-numbered gears, the other, the odd. The inactive partial transmission preselects the next anticipated gear – the next higher during acceleration, the next lower during deceleration.

The speed can be squeezed out of the engine.

With six forward gears and two dry clutches, Alfa Romeo remains very close to a manual transmission. The ratios of the first two gears are set somewhat lower compared to a manual transmission, the others are higher. This provides a little more zip in the lower range, and lower RPMs in the upper.

ITALIAN TEMPERAMENT

Guilietta becomes a fiery Italian. Veloce – naturally. I really only need the tiny shift paddles on the steering wheel for downshifting ahead of a curve. Annoyed, Giulietta sometimes howls at this. Ottmar Back keeps his cool. Insignificant?

“No,” he says honestly. Skipping two gears or more stresses the friction linings of the synchronizer rings since the speed differences are great. But HOERBIGER synchronizer rings can handle it.

We cruise N-like back into the city. Giulietta is comfortable even twin-clutched. Not as butter-soft as a transmission with a torque converter, but without hesitation or serious complaints.

That is Alfa today.

If you keep the 1.4 Turbo MultiAir happy with speed, it’s a lot of fun negotiating the mountain pass.

QUICK AND RESPONSIVE

It fits. Giulietta traverses the mountains in the Swiss canton of Zug as though she grew up there. Assuming you keep the engine happy – with speed. In the lower range, the 1.4 liter engine conceals its 230 Newton meters quite well, as they’re only effective starting at 2250 RPM. Once the turbocharger kicks in, it’s all business. Although the four-cylinder engine is acoustically shy at cruising speed, in the upper two-thirds of its RPM range it has a strong voice. Giulietta snarls when you let go of the reins.

Ottmar Back knows how to sharpen her senses further. D.N.A. is what Alfa Romeo calls its performance customizing measures, which at the press of a button can change engine, transmission, suspension and steering characteristics at three levels. Normal is what I use now. All-weather is for snow, which now lies alongside the road. It’s time for D, as in dynamic.

Giulietta is a tame city girl on request: the sporty twin-clutch transmission (TCT) also has a comfortable side.

GIULIETTA'S NEW TRANSMISSION

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Clean fuel is a central corporate goal of the Kuwait National Petroleum Company (KNPC). The state-owned enterprise not only strives to use state-of-the-art technology to produce primarily sulfur-free clean fuels. In the production process itself, energy efficiency and protecting the environment are likewise high on the agenda.

MUCH IS NEW IN THE EAST

Airlines such as Emirates, ETIHAD or Qatar Airways have become important players in transporting passengers and freight. The foundation of their success is the central geographic location of the Gulf States in a reoriented global economy.

The Gulf States lie at the midpoint among the economic centers of Europe, Russia, Africa, Asia and the Far East. Ancient trading centers have been revived due to the resource wealth of the region. Likewise, tourism has developed rapidly.

Regional industries will make an enormous contribution to the continued development of the Gulf States. Comprehensive state-supported development programs strongly encourage large oil and gas companies to make their high output more efficient, reliable and environmentally friendly.
ts roots reaching back to 1949, the Mina Al-Ahmadi refinery uses 40 reciprocating compressors in its production process. In the next few years they will be upgraded with respect to energy efficiency and environmental compatibility. In order to achieve ambitious emissions and efficiency targets, the operators of the KNPC refineries Mina Abdulla, Mina Al-Ahmadi and Shuaiba have called on external consultants, particularly when special expertise is needed.

KNPC relies on HOERBIGER’s consulting expertise. A proprietary audit developed for these customer requirements will also help KNPC conserve energy while meeting ambitious emissions goals.

HOERBIGER is a dedicated innovation and technology leader in the field of reciprocating compressors. The Group continuously invests in basic research in order to understand the flow conditions inside the cylinders and at the valves, and this knowledge is applied to the development of increasingly efficient valves and controls. A further research area includes rings and packings to improve bearing assemblies and seals for piston rods.

HOERBIGER has applied this expertise, developed over decades, to the REE audit. At the customer’s site, the audit team reviews whether and at what cost a compressor can be optimized with respect to reliability, efficiency and environmental soundness, in short REE. At the conclusion of the REE audit, HOERBIGER provides the customer with concrete suggestions for improvements. HOERBIGER and the customer then work out an implementation plan together.

This new service attracted great interest at KNPC. At the end of February 2013, the HOERBIGER REE team went to work in the Mina Al-Ahmadi refinery with a detailed analysis of each individual compressor, resulting in numerous ideas for improvement. The theoretical potential was then compared to the HOERBIGER database. Thus, the REE team could find a benchmark for each of the 40 reciprocating compressors in the Mina Al-Ahmadi refinery.

After initially spending four days on site, the REE team paid a subsequent visit a month later to present the audit results to the Maintenance Manager Tareq Y. Al-Saifan at KNPC’s MAA refinery.

**PERSPECTIVE MAINTENANCE AND PROCESS MANAGEMENT**

The experienced maintenance team led by Tareq Y. Al-Saifan was impressed. “We thought we knew everything about our compressors and how to employ them optimally. HOERBIGER’s REE team impressively demonstrated how much more knowledge could be extracted from the operating data and inspection of every single machine. There was a lot to be learned.”

**“NOW WE HAVE 40 DETAILED ANALYSES INDICATING NUMEROUS IDEAS FOR SUSTAINABLE IMPROVEMENTS.”**

Tareq Y. Al-Saifan

1 The skyline of Kuwait City is reflective of the mood of change in the entire region.
2 One-on-one consultation takes place on-site at the compressor.
3 Improvement potential for environmental compatibility – the change management process that was initiated will minimize the burn-off of leakage gas.
4 KNPC’s Maintenance team implements the suggestions from the audit as part of scheduled service work.
5 REE audit creates transparency even in complex environments, always bearing the plant as a whole in mind.
gained by including the requirements of process management in the audit. The result is impressive: “Now we have 40 detailed analyses indicating numerous ideas for sustainable improvements,” Tareq Y. Al-Saifan states.

**REE IMPROVEMENTS MUST SUPPORT COMMERCIAL GOALS**

KNPC managers themselves must determine the time lines for possible improvements. They can improve the system precisely at those points where the potential identified in the REE audit provides the greatest benefits.

For Tareq Y. Al-Saifan, the customer’s freedom to interpret the results and apply the best-possible measure is equated with a high level of objectivity. “We need competent and innovative advisors who take into account the welfare of the entire plant. The HOERBIGER team showed us more about the compressors’ performance and their capabilities during different operating states than all previous compressor experts who advised KNPC.”

**A CONTRIBUTION TO THE GREATER WHOLE**

By upgrading the refineries, KNPC intends to achieve more beyond improving the existing systems. The state-run group was founded in 1961 with the mission to make continuous contributions to the country’s progress. In the medium and long term, this primarily means producing petroleum products in an energy-efficient and environmentally responsible manner.

Broken down into the individual production and organizational areas in the three KNPC refineries, the modernization and upgrade of the refineries are part of a major corporate vision for the future. In it, concrete targets are defined for how efficient, reliable and environmentally acceptable diesel fuel and gasoline production must become. This is the yardstick.

“We are oriented toward global best-practice solutions. This is also true of the organization as a whole,” explains Tareq Y. Al-Saifan. “Structured change is a challenge, but the result will definitely bring us forward.”

Every new initiative must adhere to the management of change process (MOC) program. Prior to engaging HOERBIGER, it had already been questioned whether optimizing the compressors would contribute to the overall goals within the previously defined change processes. Already prior to this preliminary review, it was quickly apparent that the REE audit would help in a structured way to support the desired improvements to reliability, efficiency and environmental soundness.

**OIL ISN’T FREE OF CHARGE**

Why is energy efficiency especially important in a refinery? Some might think that this issue doesn’t play a role for petroleum producers along the Gulf, since they have more than enough oil.

As a result of the planned change and networking with world markets, KNPC is subject to the same price pressures as any other refinery operator. “We have to pay world market prices for the energy we consume in the production of diesel fuel and desulfured gasoline,” Tareq Y. Al-Saifan explains. Pure extraction of crude oil costs between two and four dollars. However, the selling price for crude oil extracted by the Kuwait Oil Company (KOFC) is at the current market price of about 110 dollars. “For us, that is incentive enough to produce as efficiently as possible.”

**KUWAIT’S ROAD INTO THE FUTURE**

After Saudi Arabia, the Emirate of Kuwait with its Burgan oil field has the second-largest oil deposit in the world. The three refineries in that country process over a million barrels of crude oil daily.

In Kuwait, oil and gas will provide a few more years of prosperity. Will that be enough?

The state has instituted numerous modernization projects to make the country viable for the future. Kuwait does not want to fall behind compared to its neighbors, Dubai, the United Arab Emirates and Oman. A modern infrastructure and a clean environment should form the basis for “green tourism.” Because of this, the greater part of the 125 million dollar investment program goes toward road improvement programs, rail transportation as well as repurposing the island of Falika off the coast of Kuwait in the Persian Gulf to become a green tourist oasis.

Investments are also being made in housing. In recent years, prices have risen dramatically. Space is in short supply. The government is therefore providing help with extensive building projects. A symbol of this will be Madinat al-Hareer, the “City of Silk,” with housing for 700,000 people. By 2030, the new Kuwaiti landmark will be the 1001-meter-tall skyscraper Burj Mubarak al-Kabir.

In Kuwait, energy efficiency is especially important. The effort: the REE audit. Efficient advice for KNPC’s maintenance specialists ensures greater reliability and efficiency of the entire refinery.

Up close – improvements are most apparent directly at the compressor. Teamwork in action between HOERBIGER and KNPC staff forms the basis of trust.

Concept for the Madinat al-Hareer (City of Silk), Kuwait, showing the Business Centre with the Burj Mubarak al-Kabir (Tower of a Thousand and One Arabian Nights).
HOERBIGER’s detailed consultancy with the REE audit is based on comprehensive knowledge of performance-deﬁning components and characteristics of reciprocating compressors. These components include valves, rings and packings, oil scrapers as well as pistons and piston rods. Beyond the involvement of compressors in the complex processes of a refinary, the role compressors additionally play in control and remote maintenance systems is a major element in the identiﬁcation of potential for improvement. The HOERBIGER REE audit enables customers in the oil, gas and process industry to enhance compressor reliability and efﬁciency. Frequently, in the process the efﬁciency of the entire plant is increased. With every optimization, environmental compatibility is increased.

The Kuwait National Petroleum Company (KNPC) is Kuwait’s largest reﬁnery operator. With its network of three reﬁneries, Mina Abdulla, Mina Al-Ahmadi and Shuash, KNPC has the greatest reﬁnery capacity in the Middle East. A million barrels of crude oil are reﬁned there daily.

Nearly half the daily production volume comes from Mina Al-Ahmadi, the largest reﬁnery. Over 80 percent of the fuel produced there is exported to Asia.

As a state-owned enterprise, KNPC is obligated to actively support current government programs to reduce emission, conserve energy and utilize environmentally-friendly production processes.

HOERBIGER has supported KNPC for over 15 years with its services for compressors. Previously, HOERBIGER’s service facilities in Kuwait and Dubai supplied the KNPC reﬁneries with spare parts. In addition, the components installed in the compressors were serviced at HOERBIGER facilities.

At KNPC, reciprocating compressors are primarily employed in the production of hydrogen required to desulfurize crude oil during reﬁning. In February 2013, a HOERBIGER consulting team conducted an REE audit at Mina Al-Ahmadi, the largest KNPC reﬁnery. The audit covered a total of 40 compressors and showed the KNPC maintenance department improvement potential for each individual compressor. The focus was on reliability, energy efﬁciency and environmental compatibility, or REE.

KNPC has reviewed the REE audit recommendations and is considering their implementation through the MOC program. With their concrete improvements to energy efﬁciency, they should contribute to achieving the company’s goals to save energy.

The REE audit concretely determined an energy consumption of 55 MW for all reciprocating compressors at the currently operated output. The compressors are designed for about 20 percent more capacity than the process requires; this is to compensate for production ﬂuctuations as well as to cover future production increases using the existing equipment.

Using data obtained during the REE audit, HOERBIGER could clearly show that continuous reverse current regulation would result in a 10 percent reduction of the connected load.

WHAT DID YOU EXPECT OF THE REE AUDIT?

Harsha Rao, our contact person at HOERBIGER, suggested an REE audit. When I heard about this suggestion for the ﬁrst time, I thought it was very interesting that our service provider for reciprocating compressors, HOERBIGER, had an eye on the big picture of our plant with its REE approach – especially with respect to issues important to us in maintenance such as reliability, eﬃciency and environmental soundness. For me, the REE audit was an opportunity to examine whether the path to identify and implement improvements within our corporate-wide PIR (Procedure First) change management program is actually helpful.

WAS THE PATH HELPFUL?

Unequivocally yes! HOERBIGER was provided with the technical design of the compressors and their integration into the plant as a whole. I was astonished by the knowledge Nikolaus Lubega and his team had above and beyond compressors. It was really impressive how focused the detailed analysis of the compressors was carried out. For example, based on this assessment far-reaching suggestions for increasing energy efﬁciency were made. It became clear to me why HOERBIGER is so successful. HOERBIGER thinks in terms of solutions, as we have so excellently experienced with the REE team.

“HOERBIGER THINKS IN TERMS OF SOLUTIONS”

Tareq Y. Al-Saifan, Maintenance Manager at KNPC’s MAA reﬁnery, on the cooperation with the REE team

WHAT ARE YOUR EXPECTATIONS OF HOERBIGER IN THE FUTURE?

Simply this: mechanical availability. Just like the entire plant, each installed component has to be available for operation at all times. At Mina Al-Ahmadi there is no alternative.

Despite Kuwait’s wealth of resources, we have to economize just like other companies in the world over. We can only invest what we earn with reasonable margins. Profits on petroleum products are not as high as everyone thinks. We buy crude oil at typical market prices, which represents a signiﬁcant investment. Reﬁning has to be efﬁcient and cost effective. We have teams in the reﬁnery that constantly look into the processes and whether energy is being wasted and where correspondingly attractive savings potential exists. If we can save 10 percent with the REE audit, then that is a considerable benefit.

ONE MIGHT ASSUME THAT YOU HAD ALMOST UNLIMITED FUNDS. WHY DOESN’T KNPC SIMPLY REPLACE THE OLD COMPRESSORS WITH NEW ONES?

Why should we consider total replacement of our compressors based on time in service? This is not just a question of money, but rather a matter of process reliability. We’ve adapted our compressors over years – in some cases over decades – to our processes and the speciﬁc requirements of our entire plant. I could also say that they have grown with our requirements and have become entwined with the entire facility.

Our topmost goal, therefore, is optimization of the existing 40 compressors, if possible.

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Our task is to reduce unscheduled stoppage time to zero. As a partner of KNPC, HOERBIGER has taken our engagement to heart: optimized production cycles and no idle time. The objective is higher quality at lower cost. HOERBIGER showed us where we can optimize. The resulting savings can be invested in modernization of our plants, in our personnel and in infrastructure improvements.

WHAT DID YOU EXPECT OF THE REE AUDIT?

Harsha Rao, our contact person at HOERBIGER, suggested an REE audit. When I heard about this suggestion for the first time, I thought it was very interesting that our service provider for reciprocating compressors, HOERBIGER, had an eye on the big picture of our plant with its REE approach – especially with respect to issues important to us in maintenance such as reliability, efficiency and environmental soundness. For me, the REE audit was an opportunity to examine whether the path to identify and implement improvements within our corporate-wide PIR (Procedure First) change management program is actually helpful.

WAS THE PATH HELPFUL?

Unequivocally yes! HOERBIGER was provided with the technical design of the compressors and their integration into the plant as a whole. I was astonished by the knowledge Nikolaus Lubega and his team had above and beyond compressors. It was really impressive how focused the detailed analysis of the compressors was carried out. For example, based on this assessment far-reaching suggestions for increasing energy efficiency were made. It became clear to me why HOERBIGER is so successful. HOERBIGER thinks in terms of solutions, as we have so excellently experienced with the REE team.

“HOERBIGER THINKS IN TERMS OF SOLUTIONS”

Tareq Y. Al-Saifan, Maintenance Manager at KNPC’s MAA reﬁnery, on the cooperation with the REE team

WHAT ARE YOUR EXPECTATIONS OF

HOERBIGER IN THE FUTURE?

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Almost exactly ten years ago, JX Holdings, Inc., the parent of JX Nippon Oil & Energy Corporation, ordered its first HydroCOM from HOERBIGER for stepless control of its reciprocating compressors. The company has since purchased 20 additional HydroCOM systems. Among them, in 2013, was the milestone piece: the 1000th HydroCOM system shipped by HOERBIGER.

The 1000th HydroCOM system will be used in a reciprocating compressor for hydrogen processing in JX Holdings’ refinery in Negishi, Japan. Hydrogen that is processed in the refinery is used to desulfurize crude oil when producing premium jet fuel.

“In the face of high energy costs, we must ensure that our reciprocating compressors operate as energy efficiently as possible,” explains Masashi Sakura, Executive Officer and Deputy Director of the Refining Technology & Engineering Division of JX Holdings. “We expect that the new HydroCOM installation can save us approximately 130,000 euros annually in energy costs for this compressor alone. Along with this, we also reduce our carbon dioxide emissions, thereby increasing the environmental compatibility of our plants. Stepless control additionally allows for better process control.”

Akio Ogawa, General Manager of HOERBIGER’s Japanese subsidiary HNKK, comments: “This additional HydroCOM system will be the 21st for JX Holdings. The company has saved many millions of yen over the past ten years with the existing 20 systems.”

A team of technicians from Singapore assisted in the sale of the 1000th HydroCOM system. HOERBIGER ensures that its customers receive the best-possible service by combining support from local sales offices with more in-depth technical assistance at the regional or global level.

HYDROCOM AT A GLANCE

A large number of applications of reciprocating compressors require efficient control of the feed volumes. Control systems made by HOERBIGER control the gas throughput using state-of-the-art mechatronics. As a result, they are leading worldwide in technology and economic efficiency. Only the required amount of gas is compressed. This reduces the energy costs of a 2,000-kW compressor (80 percent utilization / 9 euro cents per kWh) by approximately 300,000 euros annually. Moreover, carbon dioxide emissions are reduced with in-house energy generation.
The health-care market is booming. Aside from medical progress, double-digit growth rates in the health-care industry can be attributed in particular to a steady rise in life expectancy. According to forecasts, the worldwide health-care market is scheduled to triple from 5 trillion euros in 2011 to 15 trillion euros by 2030. This trend will be driven to a great extent by medical technology*.

* Source: Study by Roland Berger Strategy Consultants: “Worldwide healthcare sector – Opportunities for Germany” (August 2011)

Ville Laine, CEO and owner of LOJER OY, attaches utmost importance to sustainable, organic growth. Founded 95 years ago in Vammala, Finland, LOJER has been consistently owner operated. The company’s development was spurred on above all by reliability and flexibility. LOJER evolved from a metal-working operation for agricultural machinery to a foundry and then to a leading medical-equipment manufacturer. Premium operating tables, senior care equipment and medical wellness tables have been the supporting pillars of the portfolio for some 30 years now.

LOJER has always valued in-house production. Involvement in the entire manufacturing process is one of the company’s core competencies. “We are facing tough competition in Russia and Europe,” explains Ville Laine, CEO and owner of LOJER. “We can only achieve the necessary growth with sophisticated design and quality according to European standards.” To ensure the high-quality standard, the majority of parts are produced in-house: “Here in Finland we have control over the entire production process. This is our core competency. We seek out partners for performance-defining components and systems very carefully. In addition to an excellent quality standard, they must have high development expertise for innovative products of tomorrow.”
“I WAS IMMEDIATELY CONVINCED BY WHAT I SAW DURING MY VISIT TO HOERBIGER IN BARBING.”

Ville Laine

The Barbing location of HOERBIGER Automatisierungstechnik GmbH is an important supplier of LOJER. The site, which specializes in powerful micro-hydraulics, supplies the lifting columns for the operating tables made by LOJER. Ville Laine states: “HOERBIGER is our first choice in this market niche.”

INVESTMENTS IN THE FUTURE

On entering the production plant in Sastamala, located approximately 30 miles southwest of Tampere, LOJER’s manufacturing expertise becomes apparent. State-of-the-art laser cutting machines, a new multi-axis machining center and a recently delivered welding robot are the latest investments in even more efficient production.

LOJER, however, not only invests in ultramodern and efficient equipment: training and continuing education for the skilled staff working in production are also important to the company’s managers, who put emphasis on sustainability. Since Finland does not have a dual education system such as in Germany, the company takes charge of training all the skilled staff on its own. In this process, the German education system serves as a model: “When you are an employer in a thinly populated area, you have to be creative and offer more than just job security. As a result we continually invest in our personnel and in our machinery,” underscores CEO Ville Laine.

Despite high wages and extensive investments in production equipment, the business model of comprehensive in-house manufacturing pays off for LOJER. With its high standards, the company meets customer expectations in regard to quality and reliability. In the competition for innovative solutions for operating tables, the Finns are always leaders in the industry.

THE CORE: LIFTING COLUMN

Important competencies that LOJER is not able to cover with its in-house process are contributed by reliable partners. The core of an operating table is the lifting column; during surgery, it moves the table and patient with precision and reliability – and it does so in six possible axes. This requires specialized knowledge – expertise that LOJER found in HOERBIGER.

The first contact between LOJER and HOERBIGER came in 2006 at MEDICA in Düsseldorf, the leading international medical trade show. LOJER CEO Ville Laine visited HOERBIGER’s Production and Development in Barbing just a few weeks after learning about the compact design of the lifting column at the HOERBIGER trade-show booth. Ville Laine: “I was immediately convinced by what I saw during my visit to Barbing. It was important to me to find out how HOERBIGER assured the quality that we need. We had to see for ourselves on-site that we can trust HOERBIGER to supply the core of our product.”

HOERBIGER has since delivered hundreds of lifting columns for operating tables made by LOJER. In total, the Barbing location of HOERBIGER Automation Technology has shipped more than 70,000 lifting columns used in operating tables worldwide.

A SMART COMBINATION GEARED TOWARD BENEFIT AND RELIABILITY

Operating tables must be designed to last a minimum of 15 years, which necessitates maximum reliability. HOERBIGER ensures this reliability with the core of an operating table, the lifting column. This is made possible by intelligently combining and perfectly tuning standard components, such as hydraulic cylinders and connectors, control blocks and other fluid components. This combination of tried-and-tested components results in a performance-defining operating table system, which is primarily geared toward the needs of the surgical teams and patients.

An operating table must not stand in the way of physicians and nursing staff. During surgery, the patient must be virtually free-floating, which is ensured by the central attachment of the lifting column. The operating table must be easy to use, allowing the medical staff to focus on their responsibilities instead of having to undergo protracted training on the technical use of the table. Finally, the lifting column must be able to securely position and move patient weights of up to 990 pounds.

The patient weight specifications vary depending on the target market. Worldwide, there are vast differences between maximum patient weights that must be considered when it comes to dimensioning operating tables. While operating tables must be designed for weights up to 450 kilograms (770 pounds) in the United States, the required maximum figure in Asia, notably in China, as well as in South America, is 180 kilograms (396 pounds) at most. HOERBIGER therefore now offers specific lifting columns for the respective markets.

SPECIFIC DELIVERY PEAKS

Over the years, a close partnership evolved between LOJER and HOERBIGER that is marked by flexibility and versatility. Flexibility is needed because, in the market for operating ta-
bles, many clinic operators act as public contracting authorities. The release orders for the operating tables are issued throughout the year according to a pattern to which manufacturers and their suppliers inevitably must conform.

An extreme peak in demand always occurs during the last quarter of every year. “This sets in toward the end of September and results in a virtual run on shipments just before the end of each year,” explains Ville Laine. The reason behind this is simple, the government sector sets annual budgets. Clinic administrators know that a budget that has not been exhausted before the year is up will very likely be cut in the following year. Since nobody wants to start a new year with a diminished budget, orders come pouring in at the end of the year. “And we not only have to produce, but in fact deliver by December 31,” Ville Laine adds.

To be able to ship punctually, system suppliers such as HOERBIGER play a very special role. They must be able to meet these extraordinary requirements on time, without compromising quality. LOJER has an elaborate master supply agreement in place with HOERBIGER for this purpose, which allows flexible adjustments to the extreme demand in October, November and December. This flexibility in action is crucial across the entire supply chain.

FAST IMPLEMENTATION OF GOVERNMENT-MANDATED FUNCTIONAL ADJUSTMENTS

Another example of flexible cooperation can be found in regulatory error reporting and error auditing, which is extensive in the health sector. Any malfunctions of technical devices that occur or become apparent during surgery must be promptly reported to the health authority in charge. An advance notice is even mandatory in the case of emerging malfunctions or defects. These notices are collected, for example by the authorities in the EU, evaluated and passed on to clinic and hospital operators as well as manufacturers together with a directive for action.

The message is clear: a corrective measure must be developed and implemented promptly in the case of faulty medical devices. A short response time is very important. If defects are identified in LOJER’s product sectors, the manufacturer – even if not affected directly – must take precautions to quickly make adjustments.

This again requires expertise on the part of the suppliers of these performance-defining key components. If the coordination as well as the development, production and supply chains work well, it creates a competitive advantage for the supplier. LOJER therefore attaches great importance to integrating such processes at its suppliers.

DEVELOPMENT PARTNERSHIP AS THE OBJECTIVE

Innovation is not possible without development. LOJER plans to attain even more loyalty from its buyers and users of operating tables by offering added value.

In this process, the suppliers of key components will play an important role. Ville Laine: “In my former companies, I was not so much involved in product development. Sales and production were my priorities. It was not until I took over LOJER that I developed a sense for this.”

This is why the visit to HOERBIGER in Barbing was so important to Ville Laine: “I wanted to see where and how these key technological systems were being developed. I now know a great deal more about our own products and the interrelationships with performance-defining components such as the lifting column. This gives me a great number of features and benefits to highlight – I have become a true R&D fan.”

A comprehensive development partnership between LOJER and HOERBIGER is intended to cut development cycles almost in half, and thus the time until a new product is ready to launch. “This will help us a lot in the future,” adds Ville Laine.

CHALLENGING MARKET ENVIRONMENT – THE FUTURE CALLS FOR ADDED VALUE

In the coming years, LOJER’s marketing efforts will aggressively rely on the added value of the products manufactured in-house: “To be able to compensate for the additional costs resulting from the development and high-end manufacture of a quality product from Finland through higher prices in the market, we must always guarantee our customers added value compared to our competition. To accomplish this, we also take advantage of the expertise and standing of our partners, and HOERBIGER has an outstanding reputation when it comes to lifting columns.”

LOJER consistently bases the added value offense on the benefit for the customer – ease of use along with maximum reliability and functionality of the operating tables.

The next generation will have a more convenient design, notably in terms of control and maintenance aspects. Both are creating exciting tasks for HOERBIGER in the ongoing development of its lifting columns.

In the future, the surgical team must be able to determine the exact position of as many as six positioning cylinders in the lifting column at a glance. This will allow the patient’s position to be fine-tuned quickly and precisely. For the next generation of lifting columns, HOERBIGER is already working on an integrated positioning control unit as well as on an option for continuously visualizing the positions of key axes.
The reactivation of systems from earth is a significant milestone. After waking up from a deep sleep of 31 months, the probe is ready to carry out scientific missions. While the Philae lander was prepared to be put in place on the comet to carry out scientific missions, it will follow in November when the Philae lander is on its way to the comet 67P/Churyumov-Gerasimenko. Arrival on January 21, 2014, at 7:18 pm, the artificial celestial body is million miles away. Also on board of the artificial celestial body is technology made by HOERBIGER.