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# 1 | 2016 A Magazine for Voithians



Cover Story

## Keep the wheel running

### Corporate News

Interim report 2015/16: Voith holding its ground in a difficult environment

### Face to Face

Papermaking 4.0, leading the future of papermaking industry

### Focus

Half-year highlights of fiscal year 2015/16 in China

## Cover Picture:

The cooperation between Voith and CRRC started as early as in 1990s. Voith has supplied the nation's several major railway lines with its state-of-the-art technologies and products such as high-speed train gear units, couplers and front-end systems.

<b>03 Editorial</b>	<b>16 Corporate News</b>	<b>24 Focus</b>
<b>03 Koko Sheng</b> Director of Group Communications & Marketing, APAC	<b>16 Voith Digital Solutions officially began operation</b>	<b>24 Half-year highlights of fiscal year 2015/16 in China</b>
<b>04 In Brief</b>	<b>18 Voith and Triton reach an agreement: contract of sales of Voith Industrial Services is signed</b>	<b>30 Panorama</b>
<b>04 Business News</b> News from the Voith Group and Group Divisions	<b>19 Interim report 2015/16: Voith holding its ground in a difficult environment</b>	<b>30 A quarter century of devotion to the hydropower industry — The story of Fu Hongbin, chief field service engineer of Voith Hydro Shanghai</b> As of 2014, a historical 300 million KW was hit among hydropower capacities in China. The industry has transformed from an economy of scale to comprehensive strength, something that would not have been possible without people like Fu, who have devoted their youth, sweat and effort as they are accompanied by the growth of China's hydropower industry.
<b>08 Cover Story</b>	<b>20 Face to Face</b>	
<b>08 Keep the wheel running</b> Manufacturing stands as a key pillar of a nation's economy. The global trend for manufacturing companies is a transformation from product or service providers to full-line solution providers. Having embarked on the journey to Industrie 4.0, Voith is attaching more importance to customer satisfaction and service than ever before.	<b>20 Papermaking 4.0, leading the future of papermaking industry</b> In 2015, Voith introduced Papermaking 4.0 concept, a concept to achieve digitalized and smart manufacturing in the papermaking process by combing Industrie 4.0 and the papermaking industry, into China's papermaking market. Mr. Thomas Holzer, President of Voith Paper Asia, took the interview to elaborate this concept.	

## Dear Voithians in China,



With the arrival of summer, a time of growth and lushness, Voith has released its interim report for fiscal year 2015/16. While maintaining its business momentum, Voith has steadily advanced its transformation and is actively working on engineering technologies that are essential for the digital era.

The past six months have seen Voith continue its amazing performance in the Chinese market, achieving a series of firsts and bests. Meanwhile, the Group's commitment to this region stays as firm as always. The project Lotus, Voith Turbo's new facility in Shanghai is progressing as schedule. In this edition's "In Brief" (page4-page7) and "Focus" (page24-page29), we capture some of the most exciting highlights.

How will Voith approaching its 150th anniversary, manage to be more vigorous in the fourth industrial revolution? Even as we reshape our development strategy, we will continue to maintain our customer focus. Our customers are the motivation for Voith initiating a series of innovative changes, and Voith has always regarded our customers as one of our most precious strategic resources. In "Cover Story" (page8-page15), we explore how Voith is strengthening its customer focus and aligning itself with China's strategies on smart and service-oriented manufacturing so as to expand our service business and improve service quality. In "Face-to-Face" (page20-page23), Mr. Thomas Holzer, President of Voith Paper Asia, sheds light on how Papermaking 4.0 is helping customers and the papermaking industry realize intelligent transformation.

Voithians are the driving force behind the successful transformation of Voith Group. In "Panorama" (page30-page33), we share stories about Voithians who have witnessed and grown with the great leaps in China's hydro industry.

To empower more effective communication among our people, Voith is promoting a speak-up culture. Our constant exploration of new communication approaches has yielded impressive results, including a new intranet with a fresh design and user-friendly interfaces. Voith TV provides a platform for dialogue with our top management, while Voith's active presence in mainstream social media helps us communicate around the globe. In China, our official Voith WeChat public account keeps followers abreast of the latest news from the Group.

Please give your support to the Voith WeChat account by following and sharing it, just like the sustained attention you have given to Yue magazine. I would like to extend my heartfelt thanks for your support and sincerely hope that this magazine will not merely be something to leaf through, but more like a platform for dialog. We look forward to your feedback and suggestions.

Finally, I wish you all the best. Enjoy the summer!

Best Regards,

A handwritten signature in black ink, consisting of the Chinese characters '盛茵' (Sheng Yin).

Koko Sheng  
Director, Group Communications & Marketing, APAC



The first runner of the Pakistan Tarbela 4th Extension Hydropower Project was delivered.

## The First runner of the Tarbela 4th Extension Hydropower Project delivered

Significant progress has been made in the Tarbela 4th Extension Hydropower Project. On April 18, 2016, the first runner manufactured and assembled by Voith Hydro Shanghai (VHS) was delivered on schedule, measuring 8.1m in diameter and 4.12m in height and weighing 216t. As its first major overseas EPC project undertaking, VHS supplies three 470 MW Francis turbines, automation system as well as the electrical and mechanical balance-of-plant systems to this project according to the contract.

Voith has been awarded with this major contract by the Water and Power Development Authority (WAPDA) of Pakistan on

February 14, 2014, with a total value of around 1.6 billion RMB. The major project has been equipped in a joint effort of Voith Hydro's Operating Units in Shanghai and Heidenheim. Upon its completion and operation planned in September 2017, the extension will increase the capacity of the existing Tarbela dam by 40%, reaching 4888 MW. This will support Pakistan to shift its energy mix away from imported fuels and in its efforts on optimizing the nation's overall structure of power supply.

## Construction of Voith Turbo new facility in Shanghai entering into final phase

The construction of Voith Turbo new facility in Shanghai of China is entering into the final phase. The project named Lotus, a vital part of Voith Turbo global footprint and Asia Pacific regional strategy, was launched in March 2014 and construction commenced with the groundbreaking in December 2014.

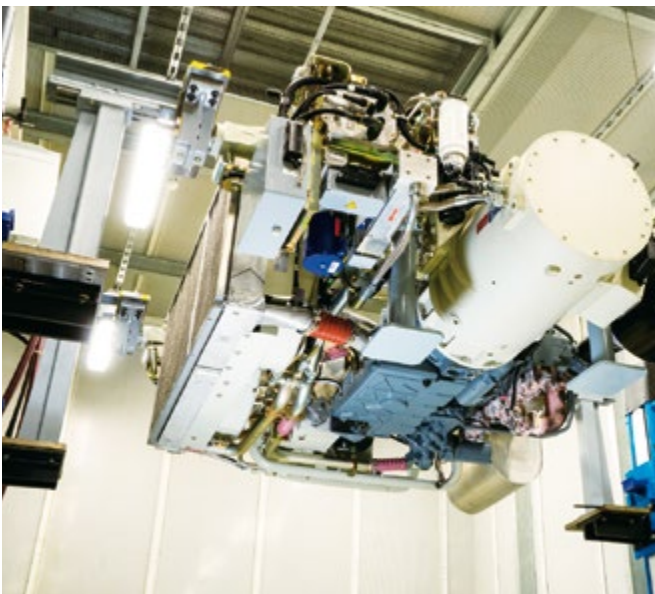
Voith Turbo is investing a total of €48.6 million in this important project, an effort to be truly local to our Chinese customers, and establish a production and engineering hub for the Asia Pacific Region. Once completed, the new facility, with a 34,000 square meter floor plan, will house both newly formed Mobility and Industry Divisions aiming for optimal use of consolidated resources and streamlined, OPEX oriented processes.

Employees will be equipped with an upgraded working environment along with the inauguration of the new facility. Most of the production facility will be air-conditioned. The office building with space for more than 200 people will offer more functional areas and meeting rooms. The new canteen will be able to seat up to 240 employees. Other new infrastructures include an information center and walkways for visitors, more parking space, larger social facility, and expanded locker-rooms.



The future Voith Turbo facility in Minhang, Shanghai, China.

## First Hybrid Rail Vehicles in China drive with Voith RailPack 400DE



Before delivery, the RailPack 400DE was extensively tested.

Voith once again made its contribution to write the history of China rail industry. The three-part vehicles of China's first hybrid rail vehicles are driven with two RailPacks 400DE, both with a 375 KW diesel engine and a 345 KW generator. The first three RailPacks have already been delivered to the customer Changchun Railway Vehicles Company Ltd.

The Chinese vehicle manufacturer has planned 30 of these hybrid vehicles. This is an absolute first for China. They are to be used in the routes in the city suburbs that have not yet or have only partially been electrified. Outside these areas, daily service runs smoothly with the Voith RailPack 400DE, while inside towns and cities the operator can run the vehicles with electrical drive, with zero emissions. The hybrid vehicles reach top speeds of up to 120 km/h with diesel-electric drive. The RailPacks 400DE also feature a quick switch system from electric to diesel-electric. The Voith drive system is also designed to withstand extreme climate demands: it can handle temperatures down to minus 40°.

## Huatai Paper's PM10 starts up successfully



Chinese Premier Li Keqiang and German Chancellor Dr. Angela Merkel witnessed the signing of Voith and Huatai.

On January 17, 2016, Huatai Paper's PM10, upgraded by Voith, started up successfully. PM10 can be connected seamlessly with the system of Papermaking 4.0, marking a major step forward for the implementation of Papermaking 4.0 by Voith and Huatai Paper together, as well as a milestone for Voith in facilitat-

ing the papermaking industry's ongoing efforts to achieve smart manufacturing.

Established in July 2014, Huatai's PM 10 involves an investment of RMB 200 million. In addition to key parts modernization and core system equipment, Voith also worked on the modernization of the paper machine's automation system. All the equipment and systems had been installed before the end of December 2015 with testing already finished.

The two companies will further strengthen collaborations in a number of areas to implement Papermaking 4.0, following an agreement to forge a strategic partnership signed in October, 2015. The signing of the agreement was witnessed by Chinese Premier Li Keqiang and German Chancellor Dr. Angela Merkel during her visit to China. The agreement involves the upgrade of existing production lines, the expansion of R&D activities, and the implementation of Industrie 4.0, which will be supported by a total of investment of RMB 840 million from Huatai.

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## Voith Papermaking 4.0 launched in Chinese market

In September 2015, Voith unveiled Papermaking 4.0 at the China International Paper Technology Exhibition. As the fourth industrial revolution is happening across the globe, Voith's Papermaking 4.0 concept aims to increase efficiency, productivity, and quality to make the entire paper production process more intelligent, cost-effective, and sustainable.

"With the Chinese economy entering the 'new normal', the country's papermaking industry is facing new requirements to bolster competitiveness and create new growth engines by achieving the transformation to smart manufacturing. Papermaking 4.0 has provided a clear roadmap. By adapting to the requirements of the 'Made in China 2025' plan, Voith is providing customers in the country with customized Papermaking 4.0 solutions so as to help the whole industry achieve smart manufacturing and sustainable development," said Mr. Thomas Holzer, President of Voith Paper Asia.



China Paper Association President and paper industry leaders visited Voith booth at CIPTE.

## Voith awarded Wudongde Hydropower Station contract

Construction at Wudongde hydropower station, the fourth largest of its kind in China, are now fully under way. Voith is supporting the Wudongde project with the supply of six hydroelectric turbine generator units and auxiliary parts with a total installed capacity of 5,100 MW. The contract has a value of around €365 million.

Voith has supplied more than 240 power units to 80 Chinese hydropower stations during the past over two decades. Following Three Gorges or Xiluodu the project marks yet another breakthrough for Voith in supporting the development of large renewable energy projects in China. The turbine generator units for Wudongde will, in terms of power output, be amongst the largest worldwide and the largest Voith has supplied in its history.

Wudongde is located in the lower reaches of the Jinsha River, the region of Huidong County, Sichuan Province and Luquan County, Yunnan Province. With its total 12 units of 850 MW Francis power generating machines, Wudongde will have a total installed capacity of 10,200 MW, nearly half of that of Three Gorges.

The Chinese government approved the construction in December 2015 with the commissioning of the Wudongde project planned to be in 2020. When finished, the Wudongde hydropower plant will have an estimated annual generating capacity of 38.9 billion KWh, and will contribute to savings of 12.2 million tons of standard coal and 30.5 million tons of CO<sub>2</sub> emissions each year.



Voith Turbo holds Accelerate project roadshow in Shanghai.

## Voith Turbo starts new organization — Accelerate project roadshow held in Shanghai

Voith Turbo is progressing on its Accelerate project according to plan, with its new organization effective as of June 1st. Aiming to provide employees with deep understanding of and involvement into the Accelerate journey, roadshow sessions where Voith Turbo management team dedicated themselves to showcase the new organizational design in all major global locations, in person, have been rolled out since May.

On May 18th, Voith Turbo organized its Shanghai roadshow session during which Dr. Uwe Knozter, President and CEO of Voith Turbo, and Mr. Bodo Klein, Voith Turbo Executive Vice President, shared the 2015/16 business updates, and communicated to employees regarding the new organization

with open conversations. The goals of Accelerate were delivered and received loud and clear: Customer Focus, Technological Leadership, and World Class Performance.

The Shanghai roadshow session was held in the soon-to-open new Voith Turbo facility. Posters were set up to give the participants clear view of the organization, and VT China management were standing in front of posters to answer questions from employees. In the following months, the new organizational structure and business processes will be implemented as planned schedule, and deep-dive meetings and dialog sessions will be held to facilitate the implementation.





The cooperation between Voith and CRRC started as early as in 1990s.

# Keep the wheel running

Manufacturing stands as a key pillar of a nation's economy. With the development of information technology, industrial enterprises are becoming increasingly aware of the importance of customer satisfaction, as well as placing more emphasize on service in the manufacturing value chain. The global trend for manufacturing companies is a transformation from product or service providers to full-line solution providers.

Having embarked on the journey to Industrie 4.0, Voith is attaching more importance to service than ever before. Service doesn't only stand as a by-product of traditional business, it also offers an opportunity for business to grow by improving the customer experience and innovation.



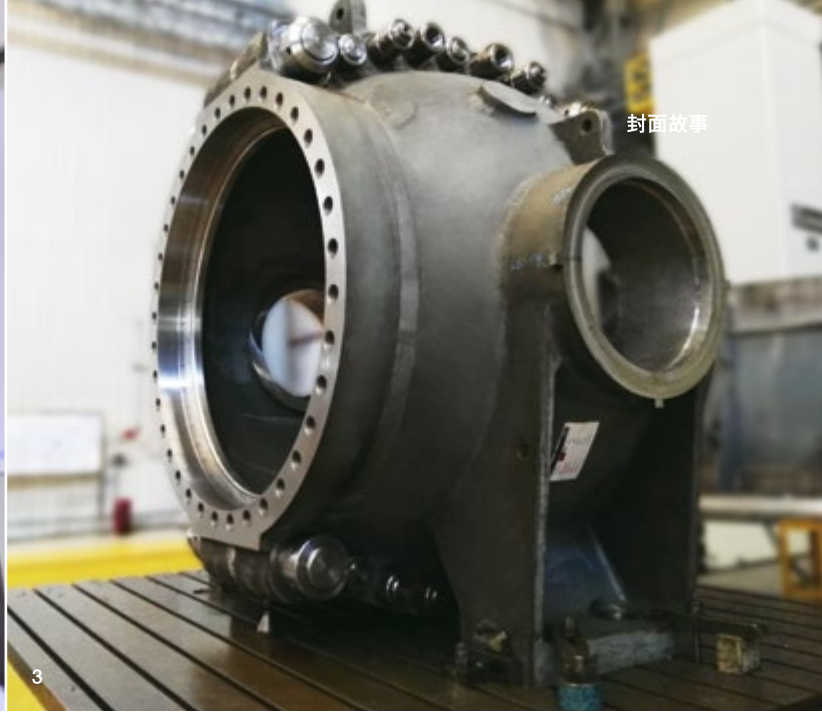
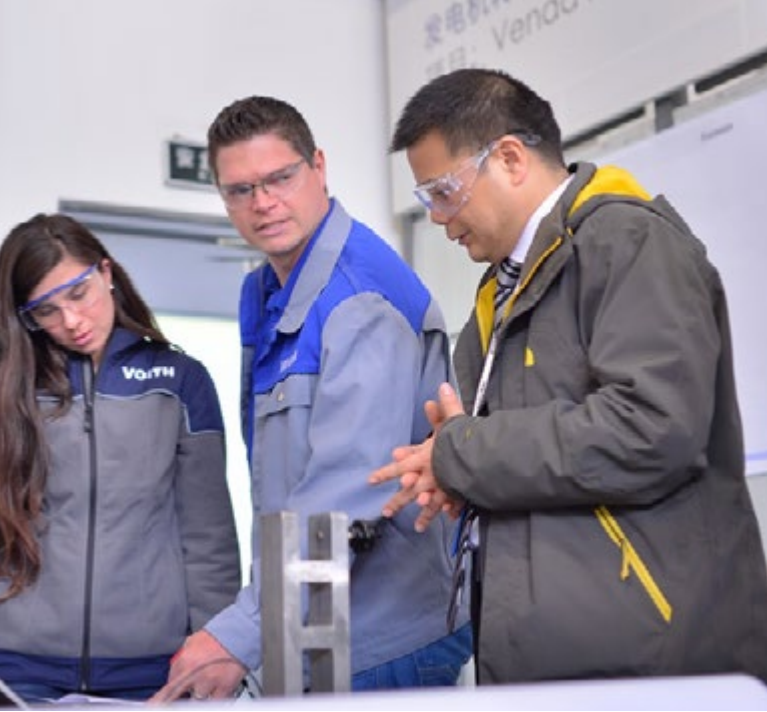
1. Voith Hydro Shanghai has developed with a history of more than 20 years since 1994.
2. At Voith Hydro, international communications support the growth of local talents.
3. Voith will provide a new valve ball to Beijing Ming Dynasty Tombs Pumped Storage Power Station.

## HyService, the Highly Efficient and Professional Hydropower Service

As a growing number of hydropower projects have been put into operation around the world, the importance of a hydropower after-market business has become more obvious. HyService, a hydropower service business, is claiming an increasingly larger share of the industry.

There are approximately 40,000 hydropower stations around the globe, and Voith has installed equipment in nearly 10,000 of those facilities. Ensuring high safety standards and optimal availability at these facilities is crucial for Voith to beat the competition. In 2010, Voith Hydro Shanghai (VHS) set up its HyService business, which has since expanded in both scale and strength, contributing to the growth of VHS.

“HyService is dedicated to providing customers with highly efficient and professional services, including routine inspec-



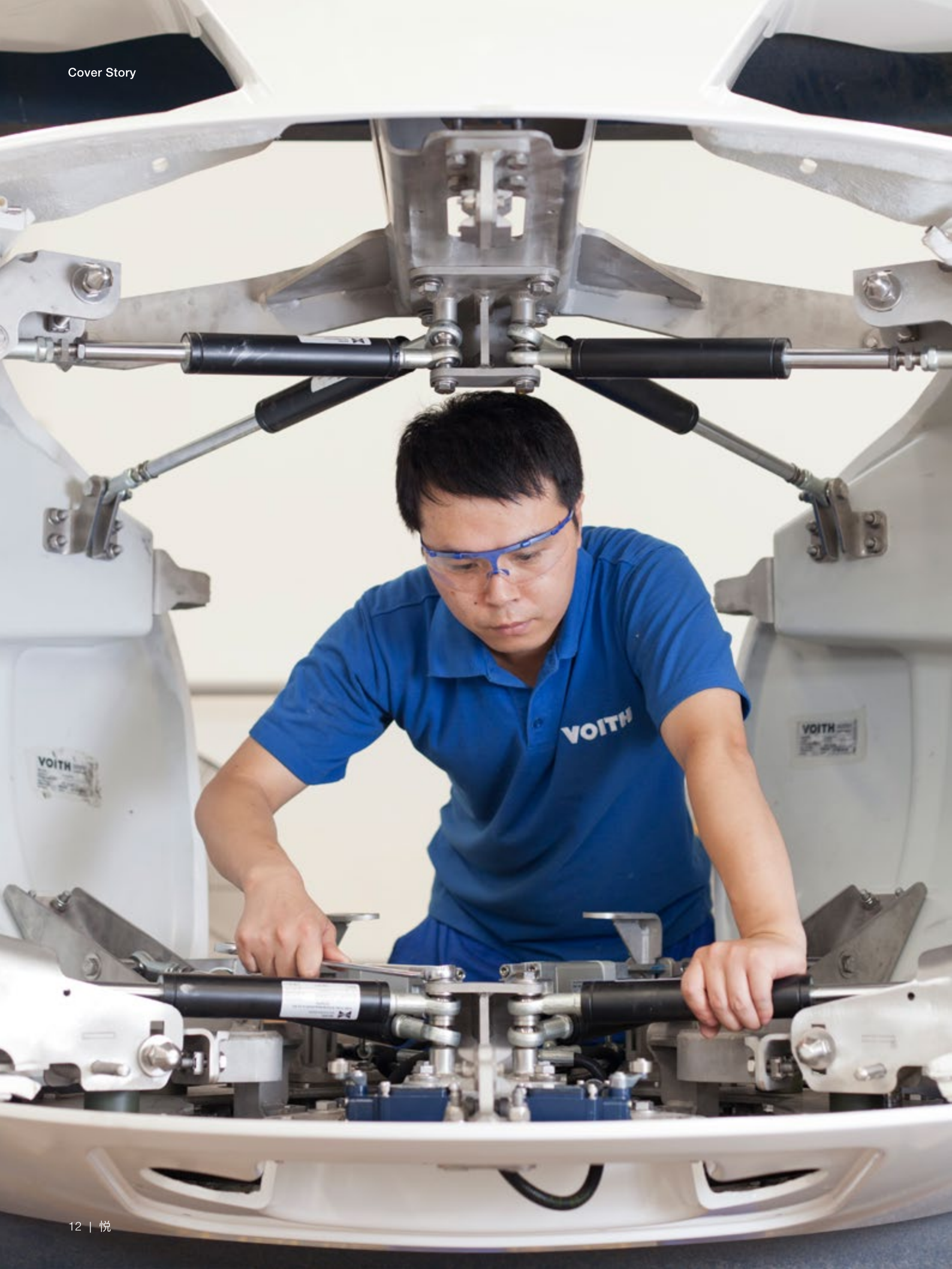
tion and preventive maintenance, repair, the supply of parts and components, and inspection and evaluation of facility and equipment. We spare no effort to make sure customer demands are met as swiftly as possible by leveraging the cutting-edge technology of Voith Hydro,” said Manager of HyService Business, VHS. “Established in 2010, HyService now has 7 people on the team and we are expecting more as the business is growing fast. The volume of orders we received in 2015 exceeded €9.5 million, which increased almost four times from the €2.5 million in 2009/10 fiscal year. The booming after-market business of China’s hydropower industry is bringing us new opportunities as well as challenges.”

In 2015, State Grid Xinyuan Company awarded VHS the HyService project for Beijing Ming Dynasty Tombs Pumped Storage Power Station. The contract included the provision of a new valve ball with a total value of RMB 10 million. This win opened business opportunities for follow-up projects, such as the modification of four more existing valve balls at

the station. It was after comparing and evaluating numerous service providers, the customer finally awarded the project to VHS for its professional technology and detailed-oriented service.

The sustained development of HyService requires the team to have both market insight and attention to detail, to be highly responsive to the market and an excellent problem solver. “Efficient and professional service is what makes Voith Hydro stand out, and this makes us very proud.”

Voith Hydro Shanghai has benefitted greatly from the rapid development of HyService. The one-stop full-line service convinces customers that Voith is capable of supporting their future business development. At the same time, effective communication helps better understand the customer’s specific requirements, which contributes to developing new hydropower projects and international projects.



Adhering to its German heritage, Voith is focused on localization so as to fully tap into the potential of local markets.

## “Customer-Focus” Principle, the Power to Further Drive Localization

The 13th Five-Year Plan (2016-2020) creates a great deal of potential in China's mass transit industry. In the next five years, China National Railway plans to invest RMB 2.8 trillion into developing the country's rail transport and urban metro systems.

In 2015, the nationwide investment toward mass transit totaled RMB 300 billion. Today, metro systems are available within 22 cities in China, totaling 2,764 kilometers in railway. In the meantime, 39 other cities have obtained approval for building their own systems, adding another estimated 7,300 kilometers, and by 2020, around 50 cities plan to be equipped with an overall 6,000 kilometers, with an estimated 30,000 rail vehicles expected to fill the demand.

Voith has continually contributed to expand China's urban metro systems by providing technical and service support for infrastructure construction. One such example is the Scharfenberg coupler, the most widely used coupler system in the world. The first time this component saw active use in China was in 1995, when Line One of the Shanghai Metro went into operation. Since then, Scharfenberg couplers have been extensively used on many metro lines in tier one cities in China.

In January 2014, the Beijing Subway Rolling Stock Equipment Company placed an order with Voith for the development of a

prototype low-floor tram in Beijing. The tests of this low-floor vehicle have been conducted through technical cooperation between Germany and China.

A clear focus on customers is one of the key aspects of Voith Turbo's strategy. Since 1996, Voith Turbo has regularly carried out customer satisfaction surveys in order to gain a better understanding of the particular needs and challenges of customers and to assess their satisfaction with Voith's products and services. Feedback has played an important role in fine-tuning the way Voith does business and makes measureable improvements in specific areas. The goal is a genuine culture of customer orientation, which is the reason behind the new facility that Voith Turbo is currently building in Shanghai.

Adhering to its German heritage, Voith is focused on localization so as to fully tap into the potential of local markets. Voith Turbo China has made an effort to strengthen its localization to respond to market changes in a faster and more targeted fashion. That includes building up the local management team and integrating a local mindset into the production and product design. Leveraging the enhanced infrastructure and local technology capability along with the new facility, Voith Turbo is in a better position to further drive localization with a more rapid and comprehensive response to customer needs.

## Smart Service, New Service Module under Papermaking 4.0 Concept

The fourth industrial revolution is happening across the globe, underlined by Industrie 4.0. In the era of the Internet of Things, with the development of technologies such as big data, mobile technology, and cloud computing, the integration of information technology and manufacturing is becoming a trend. In September 2015, Voith launched the Papermaking 4.0 concept in China, with the goal to increase efficiency, productivity, and quality to make the entire paper production process more intelligent, cost effective, and sustainable.

The concept of Papermaking 4.0 covers control equipment and software, featuring “OnEfficiency,” “OnCare,” and “SmartServices,” which will deliver connection, efficiency, predictability, intelligence, and sustainability to the papermaking industry. In the internet age, the power of big data can never

1&2. In September, 2015, Voith launched Papermaking 4.0 concept in Chinese market.



be underestimated. Take the data of a world-class board machine as an example: At its installation and commissioning, about 260 work weeks of labor are needed to conduct data analysis and maintenance, and over 1,000 metric tons of cable are needed in the field to realize the connectivity of the signals. In the future, with the help of big data and intellectual connectivity, signals can be connected through the sensors and automation systems of the paper machine, thus saving labor and field cables.

Smart maintenance ensures both the intelligence and reliability of processes through continuous process optimization driven by big data. The self-diagnosing functions of the paper machine can seamlessly integrate with the Papermaking 4.0 product, rendering high predictability, automated services and highly efficient material management within the plant. And the highest possible equipment usability can be achieved at the lowest total maintenance cost. These all need to be backed by strong service and technical capabilities.

The smart service model under Papermaking 4.0 provides tailor-made service through customized analysis, remote consultancy, system upgrade, and relevant training. Online services, remote diagnosis, and a 24-hour hotline are also available. Remote, field, and phone services supplement each other, providing customers with round-the-clock service, while data analysis, diagnosis, and real-time process optimization help customers ensure optimal performance and usability of facilities.

The papermaking industry is in the midst of transformation as market trends keep evolving. Papermaking 4.0, driven by digital solutions and smart services, will further boost customer recognition of Voith.




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The “Made in China 2025” strategy explicitly states that China will prioritize service-oriented manufacturing and the manufacturing-oriented service industry. Voith is deservedly proud of its long-held “Customer-Focus” philosophy, reflected by the rapid response to local market demands, the efficient resolution of issues, and the delivery of added value to customers by leveraging innovative technologies and business models. The Group has also been making adjustments to its organization structure, and this has allowed for more targeted and professional services for customers at the regional level. By doing so, not only is Voith able to better satisfy customer needs, but it also stands out from the fast-changing market and delivers added business value.

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# Voith Digital Solutions officially began operation

The new Group Division Voith Digital Solutions (DS) officially began operation on April 1, 2016. The integration of Voith IT Solutions (VOIS) is the first of the future units to be transferred to DS. The new Group Division will consolidate all of the Group's know-how in the field of automation and digitalization. The focus will be on the development of new digital business models for industries that Voith currently serves as well as for completely new ones. With this Voith is now positioned for a digital future within the Internet of Things.

Dr. Roland Münch, Chairman of the Management Board of Voith Digital Solutions, is excited about the future: "I'm looking forward to working with an excellent team of experienced colleagues who are making the new Group Division into an important pillar for Voith."

The first step was being taken by the employees of the former VOIS: they have been organizationally assigned

to the new Group Division, where they will work with current and future DS colleagues to drive ahead the development of digital products and solutions. The top management level team of DS has also started their responsibility for their Business Lines since April 1.

Following negotiations between the CBoM and the Works Council in Germany, there has been an agreement on the compensation in early July for the effected German employees. By July 2016, employees in the automation units of Voith Hydro, Paper and Turbo and their respective sales and service units in Germany will be assigned to the new Group Divisions. In autumn, colleagues from other countries will follow. The process will be completed by early 2017.

DS will initially begin operations in the four Business Lines with already existing digital applications. With this in mind, the management team has concretized the product portfolio of the new Group Division. The new organizational and

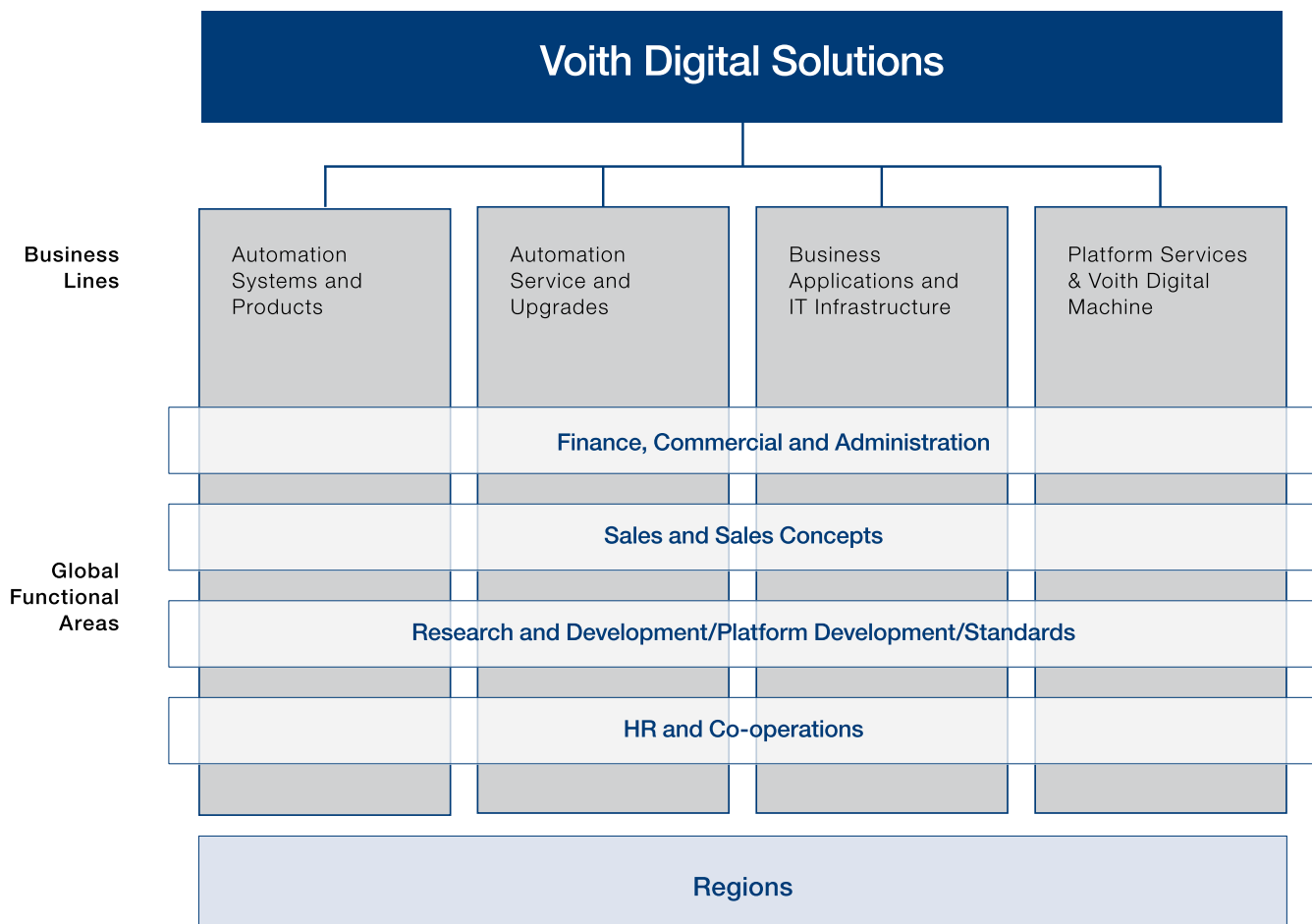
management positions have been defined – first in Germany and then gradually throughout other countries and regions.

Other important organizational processes that will be put in place by the start of the coming fiscal year on October 1, 2016, include:

- Further development and implementation of interfaces and project structures with Voith Hydro, Paper and Turbo
- Integration of Voith DS within financial reporting
- Creation and expansion of a process landscape made up of the relevant logistics and ERP systems
- Finalization of a roadmap for the DS Research and Development unit



The headquarters of the new Group Division have been located in the "Powerhouse" (building 225) and building 403 at the Heidenheim site.





In China, Voith Industrial Services has been supporting companies in the automotive industry with its comprehensive range of services for the entire production process. Today, with an employee base of over 1800, Voith Industrial Services is serving more than 50 customer sites at more than 20 cities across China.

## Voith and Triton reach an agreement: Contract of sale of Voith Industrial Services is signed

In May 2016, Voith and funds advised by the private equity company Triton have reached a basic agreement on the sale of the Group Division Voith Industrial Services and signed a corresponding contract.

The two sides have agreed that Triton will acquire a majority interest in the entire Group Division and continue it under a new name with new branding. Voith will retain 20 percent in the form of a financial investment and will accompany the transition. The parties have agreed not to disclose any further details of the sales contract. The completion of the sales contract is still subject to approval by the relevant antitrust authorities.

Within the framework of its Group-wide success program Voith 150+, Voith had

announced in 2015 that it would focus its portfolio on its technology and engineering competency for the digital age. For this reason, the company has been looking for a new owner of the business covered by Voith Industrial Services and its related activities that are mainly based on the process know-how of the customers, for example in the automotive industry.

“With today’s agreement we have taken another big step within our restructuring towards making our company a shaper of digital change in the industry,” said Dr. Hubert Lienhard, President and CEO of Voith Group, “Through this sale we have cleared the way for Voith to focus on its engineering competency in the digital age and have opened up new opportunities.”

The Group Division showed very good growth during the last fifteen years under the umbrella of the Voith Group. Since then its sales have more than tripled and its business has been clearly focused on key industries and services. For this reason, Voith Industrial Services is currently the world’s largest service supplier for the automotive industry.

“Voith Industrial Services owes its success above all to its more than 18,000 employees. On behalf of the Corporate Board of Management and the entire Voith staff, I would like to thank all VI colleagues for their longstanding loyalty and dedication,” said Dr. Lienhard.

# Interim report 2015/16: Voith holding its ground in a difficult environment

In the first half year of fiscal 2015/16, Voith positively maintained its operative business in important industries, despite a consistently subdued investment climate. Voith has also steadily pressed on with its strategic refocusing on its technology and engineering competence for the digital age.

In the first six months of the fiscal year the Voith Group and its continuing operations, (excluding Voith Industrial Services) received orders worth a total of €2.16 billion. This is equal to an increase of 19 percent compared to the same period last year. Orders on hand rose to €5.49 (5.29) billion compared to the end of the previous fiscal year.

"Apart from the non-recurring effects occurring in the first half of the year, our Group-wide success program Voith 150+ is having an impact. The Voith Group's fundamental earnings power is noticeably improved", said Dr. Hubert Lienhard, President and CEO of Voith Group explaining the development of the overall Group during the first six months.

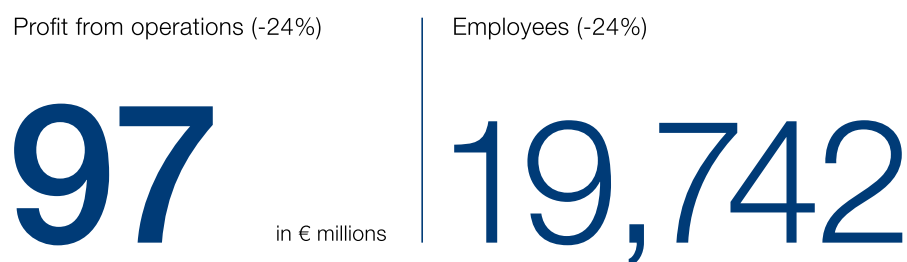
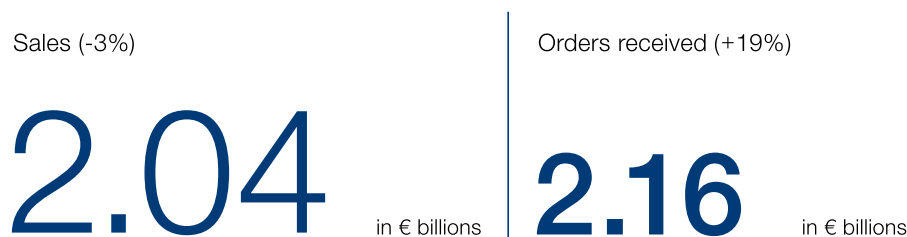
Voith recorded nearly stable sales by continuing operations of €2.04 billion compared to the previous year. Around half of the slight decline of 3 percent compared to the previous year is due to negative currency effects. Total profit from operations of the Group Divisions was up slightly on the previous year. Owing to one-time valuation effects for certain foreign currency effects on foreign currency items at the holding level, the Group's profit from operations fell,

however, year after year from €120 to €97 million. The Group net result improved significantly in the half year period from minus €131 million to minus €48 million, in part owing to the elimination of high restructuring costs. Without the impairment charges of €71 million, including on securities, the Group would have posted a net income for the half year period of €23 million.

What can we now expect in the second half of the year? Voith Digital Solutions currently remains in the ramp-up phase.

We expect to be in the black in the three existing Group Divisions in terms of profit from operations. For the Voith Group as a whole our expectations are unchanged: we expect stable sales and orders received to be at approximately the same level as in the previous year. Contrary to our original expectations, the profit from operations at Group level, however, is likely to fall as a result of valuation effects on foreign currency items. The Group net result is expected to improve on a year-on-year basis however.

## 2015/16 half-yearly figures (changes compared to the adjusted results of the previous year)



\*Excluding the discontinued Voith Industrial Services Group Division

# Papermaking 4.0, leading the future of papermaking industry

Interview with Mr. Thomas Holzer, President of Voith Paper Asia

In 2015, Voith introduced Papermaking 4.0, a concept to achieve digitalized and smart manufacturing in the papermaking process by combining Industrie 4.0 and the papermaking industry, into China's papermaking market. Mr. Thomas Holzer, President of Voith Paper Asia, took the interview by Chinapaper.net to elaborate this concept.

**Chinapaper.net: In what kind of context was the concept of Papermaking 4.0 put forward? What lies behind this concept?**

**Mr. Thomas Holzer:** With the Internet of Things or Industrie 4.0, there is a new round of technological revolution and industrial reform coming round. Being one of the important pillars of the national economy, the paper industry is facing the tendency of sustainable development and the upgrading and transformation of Chinese manufacturing industry. To respond to the trend of Industrie 4.0, Voith has introduced the

concept of Papermaking 4.0 in the first half of 2015 and built a team dedicated to the promotion of this concept in Asia.

With Papermaking 4.0, Voith is making an intelligent contribution to increase the efficiency, productivity and quality of the entire paper production process supply chain, even in existing systems and equipment.

This concept is the sum of three big talents in a "system of systems": OnEfficiency: Reduced complexity and stabilized processes to meet KPIs, OnCare: Intelligent condition based and predic-

tive maintenance, and SmartService: The service you need before you know it.

We provide our customers a clear insight in the processes running in their paper machines and help to stabilize them by means of actuators and controls. A logical consequence of this is that we are then able to also optimize processes that are stable. Connecting lots of sub-processes with one another to utilize quality data in stock preparation through to the finished product, for example, results in a measurable monetary benefit. In this context, dispensing with the excessive use of valuable re-



Mr. Thomas Holzer, President of Voith Paper Asia.

sources plays a crucial role. Energy, chemicals, fibers and time are all opportunities for this added value.

**Chinapaper.net: Is Papermaking 4.0 applicable to Chinese paper industry at present?**

Nowadays, China's paper industry is facing slowing growth and increased production costs. It has become a primary task for domestic enterprises to foster transformation and enhance their competitiveness in the market. Papermaking 4.0 aims to increase the efficiency, productivity and quality of the entire paper production process so as to

make the whole process more intelligent, cost-effective and sustainable.

Furthermore, the great efforts of the Chinese government in promoting the transformation of the paper industry have created a favorable environment for its application. In the first half of 2015, the Chinese government launched the "Made in China 2025" plan which set the directions for the future development of the Chinese manufacturing industry, namely digitalization, intellectualization and informatization, with smart manufacturing at the core. Meanwhile, the plan emphasizes green growth, focusing mainly on traditional manufacturing

industries, for example, papermaking, steel and non-ferrous metal. The goals that "Made in China 2025" plan set for the paper industry perfectly fit to those of Papermaking 4.0.

**Chinapaper.net: Up to now, has there been any actual application of this concept in either global or Chinese market?**

With more than 60 Voith paper machine references in this region over the past 20 years, we have a longstanding experience in the Asia-Pacific market. After ten years of fast development, China's paper industry is now going through the

transformation of becoming a leading high-end industry. More and more enterprises are exploring efficient and cost-effective ways of production. Therefore, highly efficient paper machines will take an important role in the future market. Papermaking 4.0 will lead the future in five aspects, namely Connected, Efficient, Predictable, Smart and Green, which suit the future development trend of Chinese paper industry very well.

We already have references around the world which clearly show the benefit and added-value of Papermaking 4.0 for our customers. In order to promote this concept in the Chinese and Asian market, a team with rich professional knowledge and experience in sales has been built dedicated to the promotion of this concept in this region.

**Chinapaper.net: In the new era of “Internet Plus”, what are the major market trends from your point of view? What should traditional papermaking companies do to stand a chance in the ever-changing market?**

In the era of “Internet Plus”, the integration of cloud computing, big data and Internet of Things into manufacturing industry have become an inevitable trend, especially for traditional industries such as the paper industry. The integration of “Internet Plus” into the paper industry has made digitalization, intellectualization and informatization an inevitable trend in this market. Papermaking 4.0 brings the benefits of these new technologies into the paper industry. Our goal is to support our customers and increase

the efficiency, productivity and quality of their entire paper production process.

To remain competitive in the future paper market, papermaking companies should take the chances offered by the Internet of Things into their consideration when making strategic plans and stepping up their efforts in transformation and upgrading. Papermaking companies should explore new ways of production which are more efficient and cost-effective in order to embark on a path leading to sustainable development. In this process, Voith's Papermaking 4.0 will definitely lend these enterprises a hand and help them gain competitive edge in the ever-changing market.

**Chinapaper.net: As we know, there are many small and medium-sized paper-**



**making companies in China. What suggestion would you have to help these companies achieve Papermaking 4.0 and smart manufacturing?**

A very important message is that our Papermaking 4.0 portfolio is truly modular. This means that we have small solutions which can be implemented just for one section of the paper machine and can be combined and connected if needed. A single module can already significantly support the paper producer and increase the efficiency of the machine. If the modules are connected, the potential is enormous.

**Chinapaper.net: What benefits can the promotion of Papermaking 4.0 possibly bring to the industry or the society on the whole?**

Voith's Papermaking 4.0 adds enormous potential economic value for its customers in order to lower the operational costs and increase productivity.

With the implementation of sensors and controllers, processes cannot only be visualized, but also stabilized and optimized. By the connection of different systems we bring the Internet of Things to life: the systems communicate with each other and by use of the gathered data they make sure that everything is running in an optimal way. This does not only reduce the complexity of the process for the papermaker – a paper machine can produce up to 50,000 signals per second – but also makes sure that resources are used efficiently.

Energy conservation, emission reduction

and pollution control in paper industry will greatly facilitate the sustainable development of the whole society. “Made in China 2025” plan clearly requires to propel green transformation of traditional manufacturing industries such as papermaking, steel and non-ferrous metal. The introduction of the concept of Papermaking 4.0 will help the paper industry achieve smart, efficient, energy-saving and sustainable development, and finally promote the sustainable development of the whole society.

The original interview article was published on Chinapaper.net in Chinese.




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In October, 2015, Huatai Paper and Voith signed an agreement to forge a strategic partnership. The signing of the agreement was witnessed by Chinese Premier Li Keqiang and German Chancellor Dr. Angela Merkel during her visit to China. The agreement involves the upgrade of existing production lines, the expansion of R&D activities, and the implementation of Industrie 4.0, which will be supported by a total of investment of RMB 840 million from Huatai.

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# Half-year highlights of fiscal year 2015/16 in China

## > October

Mr. Xu Huimin, **deputy mayor of Suzhou City and secretary of Kunshan CPC committee**, led a delegation of Kunshan Municipal Government to visit Voith's headquarters in Heidenheim. In the Kunshan - Germany Investment Promotion Conference held during the visit, Dr. Hubert Lienhard, President and CEO of GmbH, joined Huang Jian, member of Kunshan Municipal standing committee and officials from Kunshan High-tech Zone, exploring the prospect of cooperation and development.

Secretary Xu expressed his appreciation of Voith's contribution to economic growth and social prosperity in Kunshan. "For years Voith has been relentlessly expanding market presence in China and other countries. The Asia Pacific headquarters equipped with full-fledged R&D, production, commercial, and operation facilities is a living example of what can be achieved by solid cooperation and communication." (1)



2

The first unit of **Da Gang Shan Hydropower Station** successfully completed the 72-hour trial operation after one time start up, and had been directly put into commercial operation. Voith Hydro Shanghai was awarded with the Da Gang Shan contract in 2008 to provide four 665 MW turbines and accessories. Da Gang Shan is another giant station with ring gate following the project of Xiao Lang Di, Xiao Wan, Jin Ping II and Nuo Zha Du. The runner was manufactured on site. (2)

**The new fisheries research vessel** of the Shanghai Ocean University will be a first for Voith in several respects: It is the first fisheries research vessel world-wide to use the proven Voith Schneider Propeller (VSP) propulsion concept. And it is the first offshore order Voith has received from a Chinese customer. The research vessel with a length of 81.6 meters and a beam of 14.2 meters reaches a maximum speed of approximately 15 knots. Voith will deliver two 28R5 ECS/234-2 VSPs, two shaft couplings, the Roll Stabilization and the entire electronic control system including four control stands. (1)

Voith Paper joined heavyweight customers and leaders of China papermaking industry in **the 8th Paper & Pulp Industry Development Conference**, exploring issues concerning the industry's development. Mr. Thomas Holzer, President of Voith Paper Asia, delivered an opening keynote speech and shared his insights with other distinguished guests on the topic "Powerful of Equipment—business restructuring and efficient improving" in a high-end panel discussion. During the event, Voith Paper also presented a themed report — "Papermaking 4.0 – Leading the future of Papermaking industry".



On October 29 and 30, 2015, **German Chancellor Dr. Angela Merkel** visited China with a delegation of leading representatives from the German business community for talks with the Chinese government and entrepreneurs on financial and trade issues and the subject of innovation. Dr. Hubert Lienhard, President and CEO of Voith GmbH and Chairman of the Asia-Pacific Committee of German Business, accompanied the German Chancellor on her trip to China.(2)

The city of Kunshan distinguished Mr. Thomas Holzer, President of Voith Paper Asia, as an **honorary citizen of the city**. With the Honorable Citizen Award, Kunshan government recognized Mr. Holzer's contribution to the city's sustainable economic and social development as well as to fostering economic exchange between Germany and China. Thomas Holzer has worked for Voith in China since 2011. During this time, he has made sustained progress on the implementation of Voith Paper's investment plans and large-scale projects for the Kunshan location. As part of the award presentation ceremony, he expressed his

thanks for the honor and said, "For about 20 years, Voith Paper has been serving not only the Chinese market, but also the entire Asian market from this location. Voith Paper City is setting standards today in the areas of production quality, service, technology and sustainability."<sup>(3)</sup>



## > November

Voith Turbo exhibited at **the 16th China Coal & Mining Expo** introducing the highlighted products of CPC700 and CPC1000 fluid couplings. A product launch was held for the new CPC700 fluid coupling, together with a technical workshop titled "Voith Fluid Couplings, Driving the Mining Output", where Voith presented the technical features and indicators of Voith fluid coupling to technical experts of the industry.

## > December

The first set of the two Governor System for the **Hong Ping Power Station** passed customer acceptance test. This acceptance marks another milestone of governor system completely designed, manufactured and tested by Voith Hydro Shanghai (VHS), and highlights the growing competence of VHS in Hydro Power automation. These governors mark the very first one of its kind from VHS to be installed into China's pumped storage power station.

In August 2012, VHS won the order from State Grid Jiangxi Hong Ping Pumped Storage Power Station for four 300 MW complete units and its auxiliary facilities.

Voith is supporting **Wudongde** project, China's fourth largest hydropower station, with the supply of six hydro-electric turbine generator units and auxiliary parts with a total installed capacity of 5,100 MW. The contract has a value of around €365 million.

Wudongde will have a total installed capacity of 10,200 MW with its 12 units of 850 MW Francis power generating machines. The Chinese government approved the construction in December 2015 with the commissioning of the Wudongde project planned to be in 2020. When finished, the Wudongde hydropower plant will have an estimated annual generating capacity of 38.9 billion KWh.



1

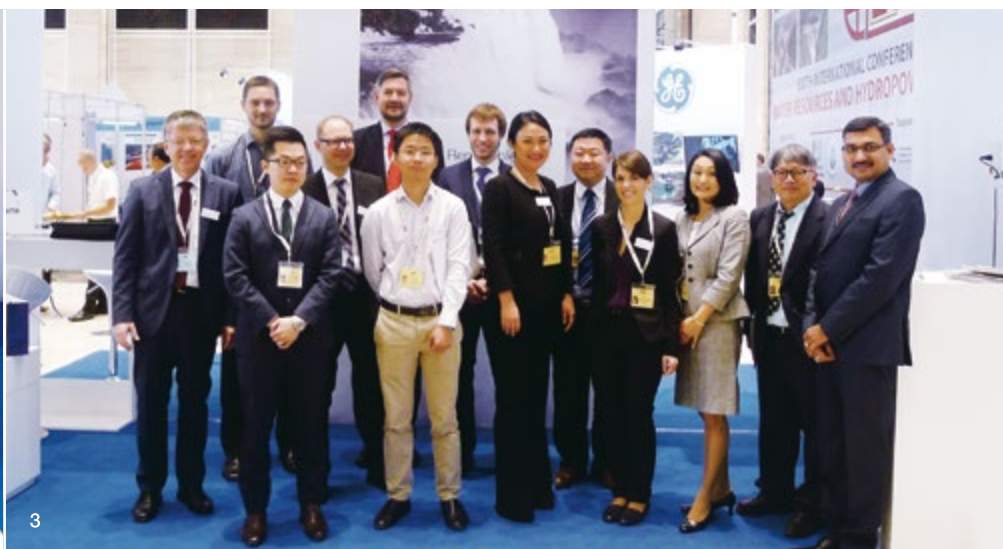
## > January

**Huatai Paper's PM10**, upgraded by Voith, started up successfully. Established in July 2014, Huatai's PM 10 involves an investment of RMB 200 million. In addition to key parts modernization and core system equipment, Voith also worked on the modernization of the paper machine's automation system, making it connected seamlessly with the system of Papermaking 4.0. All the equipment and systems had been installed before the end of December 2015 with testing already finished.

## > February

Voith VR115CT hydraulic retarder was awarded the title “**2016 Chinese Truck Users’ Most Trusted Retarder**” by chinatruck.org. Designed especially for the local market, VR115CT is developed in considerations of the working environment of heavy-trucks in China with targeted technical improvements. With a compact profile and small volume weighing 48kg, this parallel hydraulic retarder is expected to be installed matching different transmission systems and a wide range of vehicles.(1)

Voith Paper China (VPC) has received two awards for “Green Ecological Development Advanced Company” and “Safety Development Advanced Company” by government of Kunshan. With the two regarded awards the Kunshan government expressed its high appreciation for the consistent efforts and the implementation of numerous measures of VPC and honored the company as “**Top Ten Foreign-Invested Company**” of the region. (2)



## > March

Voith showcased its leading hydropower technologies at the **2016 International Conference and Exhibition on Water Resources and Hydropower Development in Asia** held in Vientiane, Laos. The spotlight came on Voith’s displayed centerpiece — the StreamDiver turbine. StreamDiver is a new compact and eco-friendly turbine from Voith, designed to step in where conventional hydropower plants may not be viable, with capacity reaching as large as 800KW. Among the numerous visitors drawn to Voith’s booth was Laotian Minister of Energy and Minerals, who talked with Voith’s staff during his visit.(2&3)



Voith Hydro Shanghai celebrated its 20th anniversary in 2014, when Fu Hongbin and his team returned after four-and-half year on-site service of the Xiluodu project.

# A quarter century of devotion to the hydropower industry

The story of Fu Hongbin, chief field service engineer of Voith Hydro Shanghai

In August 2013, the first generator unit Voith Hydro delivered to Xiluodu Hydropower Station successfully completed its trial operation. Voithians who had been devoted at the construction site day and night for weeks on end were deeply encouraged after hearing the news. The giant project finally completed in June 2014. Fu Hongbin, the chief field service representative, went back to Shanghai together with his team, having spent four and a half years altogether at the construction site.

25 years ago in the 1990s, Fu Hongbin was assigned to the SinoHydro Bureau Six Co., Ltd after graduating from college. Back then, there were not too many large-scale hydro power projects to be built in China. However, when the total installed capacity of hydro power stations hit 100 million KW in 2004, China surpassed the U.S. and became the largest hydro power production nation. It was in October of 2004, Fu joined Voith Hydro Shanghai as a field service engineer.

“Baise Hydropower Station in Guangxi was the first project for which I was part of the field service team after joining Voith. With generating unit capacity of 135MW it was a medium-scale project back in 2004,” said Fu, who still had vivid memories of 11 years ago when he first provided field service to the client.

The “field service” Fu is referring to includes technical supervision, quality

management, equipment inspection, on-site coordination and equipment checking, communication with the power station owner and supervisor, and collaboration with other departments of Voith. And the field service starts right from delivery of the first part, and lasts until the complete delivery, installation and handover to the client

Since he became a field service engineer with Voith Hydro Shanghai, the 50-year-old Fu Hongbin has spent almost the whole past decade on site, working for Guangxi Baise project for two and a half years, Qinghai Laxiwa project for three years and Yunnan Xiluodu project as the chief field service representative for four and a half years.

“As the chief field service representative, his proficiency in business is unrivaled. Leading by example, he pursues perfection in each task with a sincere, detail-oriented and responsible attitude.

He has won recognition from various stakeholders,” the power station owner said, complementing Fu Hongbin and the whole Voith project team. Still, in order to earn such praise, the men had to go through unimaginably difficult and lonely times.

As we all know, hydropower stations are normally located in remote areas in the mountains with poor transportation. In many projects, Fu found himself with no fixed office, forcing him to rent a place from the installer as a temporary working area instead. When containers were needed for large projects, a converted office could be created within them.

When asked to talk about life and entertainment on the construction site, Fu said, “Let me give you an overall picture of a typical day on the field instead. Take my experience at Xiluodu as an example. A normal work day starts with checking my e-mails before going to the





construction site. We should get to know anything the power station owner was seeking our solutions for and feedback it to the company. If something were to happen at the construction sites, we would try our best to resolve it on site, but outstanding issues we are not able to tackle would be reported to the company." Fu continued to describe what it was like working day to day on a construction site, which was something he could not be more familiar with. "Many sites are located underground in caves with extreme conditions. And the field work can be very intensive, and weekends and holidays are hardly expected. We are often so tired after a whole day's work that the only thing we'd like to do is have a good sleep. "

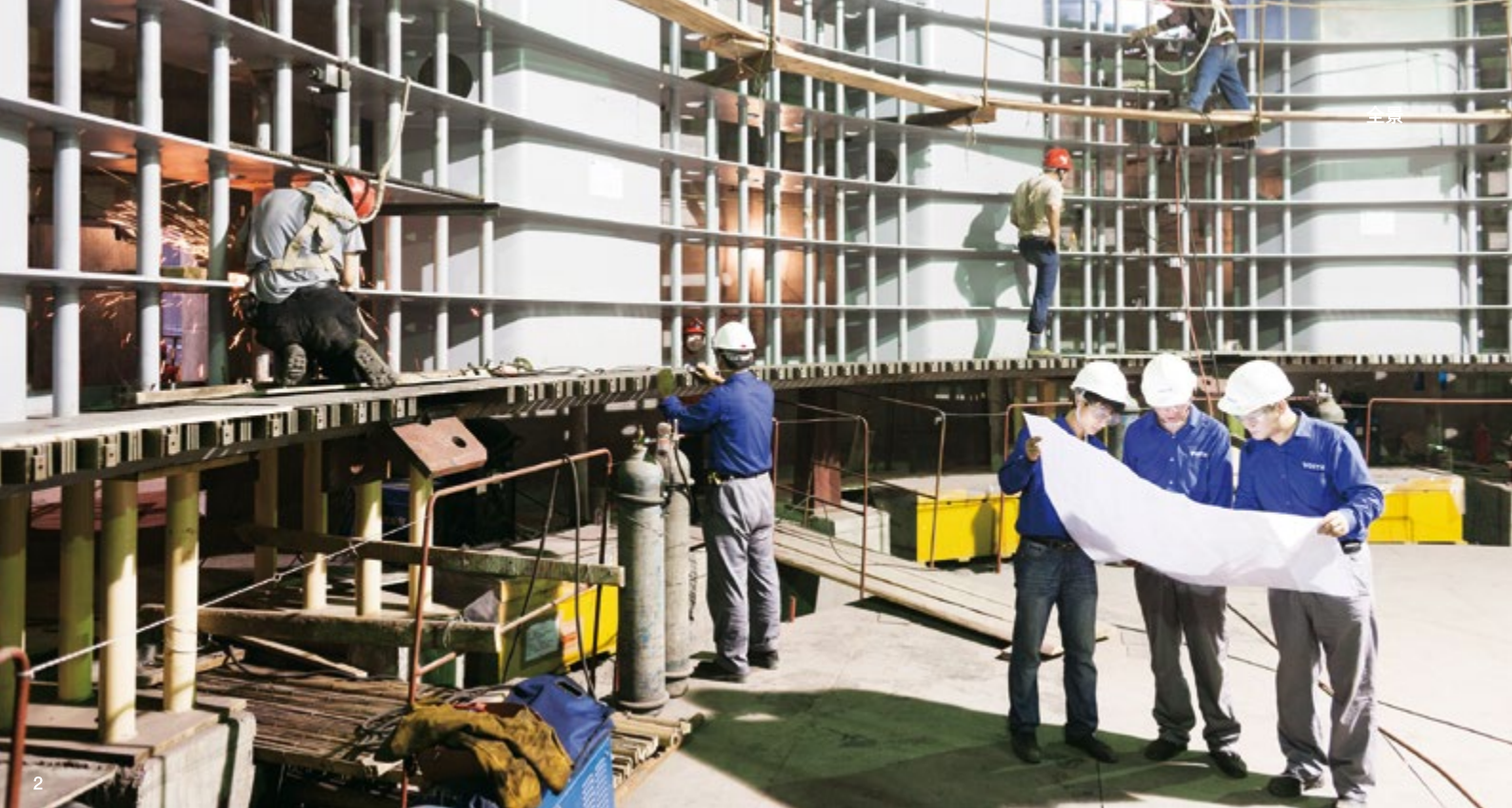
Qinghai Laxiwa Hydropower Station is located at an attitude of 2,240 meters,

so people from low attitude areas visiting there would gasp for breath merely stepping up a couple of stairs. Fu, however, worked a full load every day and kept a line of steady communication going with the power station owner. "We have made it through several hurdles, big and small, during these years. Communicating and building a harmonious relationship with the owner on the site is absolutely essential." Field service representatives have to communicate with the owner most frequently during the execution of a hydropower project. "Besides communication and collaboration, whatever support and effort we can get from the entire Voith Hydro team is also indispensable for us to gain the client's recognition."

With the indispensable support from Voith Hydro and the loving tolerance of his family, Fu Hongbin was able to fully

dedicate himself to the brutal work on site for over a decade. Fu's wife completely understood his position, as she shared the same major in hydropower in college, but Fu still could not manage to hide his regret as he talked about his family who does not see him all that much. "It's too much for my wife to take care of our family all alone," he said. "I hope we can be together more." After the completion of Xiluodu project in 2014, considering his long-time field service dedication, the company has arranged Fu another position.

2014 is a milestone for both China's hydropower industry and Voith Hydro Shanghai. During that year, a historical 300 million KW was hit among hydropower capacities in China, allowing the country to rank first in the world. Also that year, Voith Hydro Shanghai celebrated its 20th year anniversary of establishment.



China currently has five hydropower stations ranking among the world's top 10 in terms of capacity. Over half of the world's super-scale hydropower units with a capacity equaling or exceeding 700 MW, are located in China. In December 2015, the Chinese government approved the construction of the Wudongde Hydropower Station on Jinsha River. Wudongde will have a total installed capacity of 10,200 MW. With its commissioning planned to be in 2020, China will continue to refresh its record of maintaining the largest single hydropower unit capacity in the world.

From planning and design, equipment manufacturing, development and construction to operation and maintenance, China's hydropower industry has evolved into a leading position and has formed an advantage in providing full-line solutions. The industry has transformed from

an economy of scale to comprehensive strength backed by quality, something that would not have been possible without people like Fu Hongbin, who devote their youth, sweat and effort as they are accompanied by the growth of China's hydropower industry.

"If your son were to become a field engineer like you, do you think you would support him?" Fu, who obviously did not expect this question, paused and said, "Well, there are a lot of other functions in the hydropower industry he can choose from. Being a field engineer is valuable experience, but not his only option," showing his 25 years dedication and deep attachment to the hydropower industry.

1. In 2012 Voith provided the most powerful generator-turbine unit ever built to Xiloudu Hydropower Station on the Jinsha River.
2. The construction site of Xiloudu Hydropower Station.

## **Masthead**

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