SIEMENS

Siemens R&D in China

Siemens is one of the world's most innovative companies. The company aims to be a trendsetter in all its business sectors, and to shape its technologies with a clear focus on delivering tangible and valuable benefits to customers and stakeholders for their sustainable growth.

Siemens has been increasing investment to enhance R&D capabilities in China, which is one of the most important R&D bases for the company. The company has over 2,300 R&D staff, 19 R&D hubs and 4,314 patents active in China as of Fiscal Year 2013 (October 1, 2012 - September 30, 2013). The emphasis is to locally design and develop the right products and solutions for the Chinese market to meet local customers' needs, and also to use China's advantages to develop technologies in the country for global application.

Corporate Technology

As an indispensable part of Siemens Corporate Technology global innovation network, Siemens Corporate Technology China (CT China) was established in 1998 and started significant expansion in 2004 with a mission to develop unique innovations for Siemens business in China and worldwide.

With diverse market needs and customers who are willing to try new things, China is an ideal place to develop world-class innovations. To best use these strengths, the innovation strategy of CT China is to lead in high-end markets with Mainstream Innovation, and change the games in emerging markets with S.M.A.R.T. (Simple, Maintenance-friendly, Affordable, Reliable, and Timely-to-market) Innovation, which is a new way to do an old thing, and good enough for a group of initial customers in emerging markets with the potential to move up into mainstream and change the games. CT China is also working on Cost Innovation, which can sustainably reduce

the cost without sacrificing the value to the customers. The research fields of CT China cover Industry, Energy, Healthcare and Infrastructure & Cities to address the main challenges facing China.

In 2005, Technology-to-Business China was established in Shanghai with the outside-in model to work with external innovation sources to systematically bring their innovations into commercial usage. CT Corporate Intellectual Property (CT IP) bundles intellectual property strategic functions on a corporate level. CT IP provides professional services and governance in the areas of intellectual property, including patents, trademarks, technology transfer and licensing issue. In 2009, CT Development Center China was established in Nanjing and Shanghai to provide efficient product development and service for Siemens Sectors.

Now, about 380 top-notch innovators are working in world-class CT China innovation labs in Beijing, Shanghai and Nanjing. As a responsible citizen in China's innovation society, we also work closely with Chinese universities and research institutes to create win-win situation to contribute to China's "Indigenous Innovation".

Industry Sector

As a pioneer in innovation, Siemens Industry Sector has been consistently investing in research and development to maintain world-leading position in technology to address the changing demands of the industrial customers. Innovation has been a DNA in the Sector, and it has been inspiring us to develop cutting-edge technology in China, and even in the global markets.

Currently, the Sector has established eight R&D hubs in China. To better serve the Chinese market and answer the government's call for greater energy efficiency and sustainable development, the Sector has developed and launched a number of products that have been highly recognized by the markets and customers, ranging from automation to drive products, including Smart Line HMI, SINUMERIK 808D CNC controller, SIMOTICS GP 1LE0 high efficiency motor, SIRIUS Local control and protection products.

The Sector will continue to focus on R&D to help Chinese customers to achieve both business and sustainability objectives.

Infrastructure & Cities Sector

Siemens Infrastructure & Cities Sector has dedicated its R&D force to providing innovative technologies for city infrastructure construction. At present, the Sector operates six R&D hubs across China to research and develop products and systems of building technologies, power automation, rail automation, circuit protection devices, gas insulated switchgear, etc.

Beijing Siemens Cerberus Electronics Ltd. (BSCE) was founded in 1995 and is a wholly owned Siemens subsidiary. BSCE is located in Beijing Zhongguancun High-Tech Development Zone. As a high-tech company with about 600 employees including more than 200 R&D engineers, BSCE is a key global Center of Competence of Building Technologies for S.M.A.R.T. fire safety and HVAC (heating, ventilation, and air conditioning) products. Its advanced products and systems combine the highest comfort and safety with energy efficiency in an intelligent way.

BSCE develops, manufactures and markets more than 1,200 products to more than 60 countries in Asia Pacific, America and Europe. Its R&D team has been established since the foundation of BSCE. After more than 20 years' development, and by sharing advanced technologies, expertise, development processes and platforms with the European and US counterparts, BSCE's R&D team has strong capabilities in software and hardware development as well as testing. Its innovative, reliable and cost-efficient products are also contributing to global projects in Europe and United States.

Siemens Power Automation Ltd. (SPA), established in 2004, is part of Siemens Smart Grid Division under the Infrastructure & Cities Sector. SPA has its own R&D set-ups in its value chain from the beginning. As an integrated part of the Siemens Energy Automation (EA) worldwide global research and development network, SPA R&D creates local products and solutions tailored to the Chinese customer's needs, and also works on EA international R&D projects and

products. The team, including project managers, product lifecycle managers, developers and testers, passed CMMI (Capability Maturity Model Integration) level 3.5 in 2008. With its own hardware and software development projects and complete responsibility for the R&D projects, SPA R&D has become one of the leading teams among the Siemens' worldwide R&D organizations. SPA R&D is joining hands with local universities to develop high-tech and state-of-the-art solutions in the areas of protection algorithm and energy automation applications. SPA R&D has around 130 people currently and plans to expand the team to nearly 160 people by 2014. With innovative technologies and excellent R&D processes, the team develops high-quality protection and energy automation products to guarantee that the businesses of customers are successful from the very beginning.

Siemens Signalling Co. Ltd., Xi'an (SSCX), a joint venture of Mobility and Logistics Division (MOL), has been dedicated to the technology import and local R&D since its foundation. The innovation hub of SSCX, as an important R&D hub of MOL Rail Automation (RA) in China, is integrated into the global R&D strategic system of RA, taking the related responsibilities in product and system management in RA global business strategy. By September 2012, SSCX had been awarded 15 utility model patents and one invention patent by China's State Intellectual Property Office. Currently, S700 K-C electric point machine, S 21 Balise system, Az S 350 U axle counting system, all introduced and adaptation-designed by SSCX, are widely used in China's speed-up lines, passenger-dedicated lines, high-speed lines and metro lines. Besides, the JM2 end position detector and SRT6 contact group, independently developed by SSCX, passed the technical audit by the Ministry of Railways. Now, they are widely used in passenger-dedicated lines and high-speed lines.

Siemens Circuit Protection System Ltd., Shanghai (SCPS) is a joint venture established by Siemens Ltd., China and Shanghai Power Transmission & Distribution Co., Ltd. SCPS produces circuit protection devices with outstanding performance. Its R&D hub was established in 2006, and has 45 people so far. It focuses on competitive circuit protection products, which perfectly fulfill customers' needs with smart design and reliable quality. In October 2011, SCPS R&D hub became a global development center for low-voltage electronic safety devices.

The R&D hub of Siemens Medium Voltage Switching Technologies (Wuxi) Ltd. (SMVS) is responsible for new products development and localization of whole portfolio of medium-voltage gas insulated switchgear (GIS). It has 44 R&D engineers and well-equipped test labs. To better serve the Chinese market, this R&D team has implemented projects for primary and secondary products just after launch of the new product SIMOSEC 12, which was tailor-designed for the Chinese market.

The integrated air insulated medium voltage R&D team is made up of Siemens Switchgear Ltd., Shanghai (SSLS) R&D hub and the SMVS Vacuum Interrupter R&D hub. As part of the global R&D hub of Medium Voltage & Systems Business Unit (MS) under the Low and Medium Voltage Division, the team undertakes various projects based on requirements of customers worldwide. The R&D hub in Shanghai is responsible for designing and developing medium-voltage air insulated switchgear, vacuum circuit breaker and vacuum contactor, while the R&D hub in Wuxi is committed to designing and developing medium-voltage vacuum interrupter. With more than 100 people, the entire R&D team aims to develop customer-oriented medium-voltage products based on latest IEC, GB and DL standards.

Energy Sector

Siemens Energy is the world's leading energy technology and solutions provider. With its service spectrum and innovations, the Energy Sector is shaping development of the global energy systems. As a committed partner of China's energy industry, the Sector has established comprehensive R&D set-ups in China to better serve the needs of local market.

Siemens Power Plant Automation Ltd. (SPPA), located in Nanjing, Jiangsu Province, is the main supplier of Siemens' power automation control system and optimization management system in China. With the rapid development of China's power industry and higher demands for green power in the country, in order to provide safe, economical and optimized operational products and services with overall solutions to power plants, SPPA devotes itself to promoting the concept of modern digital power plants in China. In the field of power plant automation, Siemens power automation control systems such as SPPA-T3000, SPPA-R3000 and SPPA-E3000, equipped

with the most advanced software and hardware, are able to offer various automation control strategies and optimization control software for supercritical and ultra-supercritical units, environmental protecting units (air cooling, desulphurization and deNox cycle units) and combined parameter operation, so as to meet the requirements of the integration of management and control for modern power plants, for example, the SPPA-T3000 for Shanghai Waigaoqiao Power Generation Co. Ltd. Phase III (2X1,000MW). Moreover, SPPA has already achieved rich experience in automation control system for nuclear power plants to generate power with cleaner energy, for example, Jiangsu Tianwan Nuclear Power Generation Co. Ltd. Phase I (2X1,000MW). Meanwhile, automation digital control systems have also been applied to the integrated gasification combined cycle (IGCC) power plants in recent years. To create an excellent and flexible digital platform for the modern management in power plants, SPPA develops research and development in optimization management software for power plants, such as SPPA-D3000 power plant advanced intelligent diagnosis system and SPPA-M3000 power plant production management system.

As one of the first global R&D hubs of Siemens Energy in Shanghai, Siemens Steam Turbine R&D Hub aims to build up steam turbine expertise in China, transfer leading steam turbine technology from Germany to China and develop advanced steam turbine products for China and other Asian markets. In order to support establishment of supply base in China, the hub has a special focus on component developments. At the same time, the R&D hub will also carry out R&D activities on the next generation steam turbine products development for large coal-fired power plants. These advanced products will support the ambitious goals of China in terms of increased power generation efficiency and CO_2 emission reduction, manifested in the 12th Five-Year Plan.

Siemens Gas Turbine Engineering China Hub was established in 2009 by the Gas Turbine Business Unit of the Fossil Power Generation Division (E F) and CT China. The hub has carried out a series of projects and tasks, including new gas turbine frame R&D, existing frame modification & upgrade, customer order engineering, field service support, supply chain management support and manufacturing support, etc. At the same time, with the support from CT China and E F Division headquarters, the hub has developed advanced design technologies on engineering optimization, cost

modeling and knowledge management. The hub has become an engineering center of excellence to add value to the overall gas turbine value chain both in China and globally.

As a part of Siemens global network, Siemens Industrial Turbomachinery (Huludao) Co., Ltd. (SITHCO), located in Huludao, Liaoning Province, has set up a local R&D hub with support from headquarters. The R&D hub offers engineering and manufacturing of turbo compressors and steam turbines for petrochemical and power generation industries as well as waste water treatment plants in China. Currently, SITHCO has the competence to independently design and manufacture state-of-the-art products, including the multi-shaft integrally geared compressor STC-GC, single shaft centrifugal compressor STC-SV, and steam turbine SST-150 as mechanical drive. The large-size SST-400 steam turbines for biomass power generation and SST-600 steam turbines as mechanical drives are also planned for localization.

The Power Transmission Division (E T) is well established in China. With its complete R&D and manufacturing network in China, the Division supplies tailor-made products, systems and solutions for Chinese customers. The E T China R&D and S.M.A.R.T. Development Center was established in 2011. Combining local competence and know-how with Siemens global processes, design and high quality, the center maximizes customer's benefits by developing and offering S.M.A.R.T. products. The center integrates the R&D competence of Siemens High Voltage Switchgear (Shanghai) Ltd. (SHVS), Siemens High Voltage Circuit Breaker Co., Ltd., Hangzhou (SHVC) and Siemens Transformer (Guangzhou) Co., Ltd. (ETGZ), and is strongly committed to developing innovative and customer-oriented high voltage-gas insulated switchgear, high-voltage circuit breaker and transformer.

Healthcare Sector

Siemens Healthcare is the world's leading supplier of medical solutions, with six operating companies producing CT (computed tomography), MR (magnetic resonance), X-ray, ultrasound, hearing instruments and in-vitro diagnostic equipment to meet demands from China, Asia and all over the world. The headquarters of Siemens Healthcare China is located at the Shanghai International Medical Zone.

For years, through its customer-oriented technical innovations and comprehensive healthcare solutions, Siemens Healthcare is devoted to providing high-quality medical services to more people in China.

As part of the Siemens Healthcare global CT R&D team, the Siemens Shanghai Medical Equipment Ltd. (SSME) is Siemens' only CT R&D and manufacturing hub outside Germany. In 2005, the hub launched the very successful two-slice entry-level CT system SOMATOM Spirit for global market. In 2007, the hub successfully launched the new SOMATOM Emotion 6/16 Slice CT for global market, which provides excellent performance in both routine examinations and clinical research. In 2010, an updated version of the new SOMATOM Emotion 6/16 was launched, further enhancing the product quality and cost performance. In the following two years, SOMATOM Perspective, a 128-slice CT scanner mainly developed by SSME CT R&D team, was launched at RSNA (Radiological Society of North America) in November 2011. Meanwhile, SSME CT software team has tied up with Healthcare R&D hubs in Germany for the development of advanced software for CT system.

In 2005, SSME established X-Ray R&D and manufacturing hub, which is the largest development and production base for Siemens X-Ray system outside Germany. This hub focuses on development of the entire range of X-Ray equipment such as radiography, fluoroscopy, mammography and surgery products for both domestic and global markets. SSME in October 2008 launched the remote-controlled fluoroscopy system AXIOM Iconos R100, which is Siemens' first product specifically designed to meet the demands of China's basic healthcare market. This product is an example of SSME's strategy to develop affordable and high-quality S.M.A.R.T. products. In August 2011, SSME first globally launched the mobile detector radiography system Multix Select DR. In the meantime, it announced the establishment of XP global competency center. In mid-2012, a new fluoroscopy system, Lyminos Fusion, was launched and shipped to the world and China. In the future, SSME will continue to develop state-of-the-art equipment to meet the market demands and provide comprehensive digital radiological imaging solutions.

Since 2003, the Component and Vacuum Technology Business Unit (CV) has gradually established the R&D and manufacturing hub in SSME, focusing on mechanism, electronics & control unit, electrical components, high-voltage generators, etc. It has rapidly grown to become a pillar force of Siemens in localization and cost-optimization for Siemens' high-quality products. CV provides a wide range of key components for imaging devices, such as constructions and control units for various radiography, fluoroscopy, angiography systems, patient handling tables e.g. ESSENZA PTAB and PHS1 for mid-range MR and CT systems and mid-range ultrasound system. The transfer of X-ray high-voltage generators and CT slip-ring from headquarters to China becomes another core component locally. With the newly launched "mechanical center" in early 2011, the extended fine welding and high precise CNC machining capability could further satisfy the demands for product development and manufacturing.

As the only R&D and manufacturing base for X-ray tubes and their assemblies outside Germany, Siemens X-ray Vacuum Technology Ltd. Wuxi (SXVT) was established in 2003 with a registered capital of RMB45 million, and it started delivery to the global and local markets in 2004. So far, SXVT has developed the RAY-6 and SR120. A new X-ray tube dedicated to the rapidly-growing local digital radiography market was launched to the Chinese market in March 2012 after a development period of only one year and a half, which makes this product development project one of the fastest within global Healthcare.

Located in the Shenzhen High-tech Industrial Park, Siemens Shenzhen Magnetic Resonance Ltd. (SSMR), a wholly owned subsidiary of Siemens Healthcare, was founded in 2002, occupying a total area of 30,000 square meters. SSMR is an integrated high-technology enterprise with R&D, manufacturing, sales, technical support and comprehensive services. With the global strategy support from Siemens Healthcare, SSMR has become the second biggest research & manufacturing hub besides MRI headquarters in Germany. Meanwhile, SSMR is the only base in Siemens MRI Business Unit which is able to research and manufacture all the components of MRI system simultaneously.

As an important part of Siemens' integrated MR strategy, SSMR works closely with headquarters in Erlangen, Germany and Siemens Magnet Technology Ltd. in Oxford, UK, for the development of our best-in-class magnetic resonance imaging (MRI) products, which always set the trend in the global MRI business. SSMR now supplies a wide range of MRI products with leading technology and excellent quality and has delivered more than 2,000 MRI systems to customers of North America, Europe, Middle East and Asia Pacific. Those products are: MAGNETOM Aera, the first 1.5T superconducting MRI system with Tim 4G+Dot technology, which is the breakthrough in 1.5T imaging; MAGNETOM ESSENZA, a robust 1.5T superconducting MRI system, which integrates various Siemens' patent innovative technologies; and MAGNETOM C!, the third generation 0.35T C-shaped Open Permanent Magnet MRI system of Siemens.

Additionally, as one of the three global Headquarters Support Centers (the other two are respectively located in Germany and the U. S. A.), SSMR focuses on providing high-quality after-sales services and uptime technical support for its Asian-Pacific customers.

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About Siemens in China:

Siemens AG, founded in 1847, is a global leader in electronics and electrical engineering, operating in four business areas: Industry, Energy, Healthcare, Infrastructure and Cities. For more than 140 years since its entering into China in 1872, Siemens has pioneered the cooperation with the country with its solutions, technologies and products, and has been known in the country for its quality and reliability, technological excellence and innovation. In Fiscal Year 2013 (October 1, 2012– September 30, 2013), Siemens generated revenue of €6.14 billion in China, with nearly 32,000 employees, 19 R&D hubs and 76 operating companies* across China. Siemens has become an integral part of the Chinese economy and society, and continues to partner with the country to address her pursuit of sustainable development.

* The figure is based on Siemens' continuing operation in China.

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