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SHANGHAI ELECTRIC 上海电气

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DRIVEN BY NEW INFRASTRUCTURE, SMART TRANSPORTATIONON THE WAY

上海电气 SHANGHAI ELECTRIC

FULFILLING YOUR DREAMS THROUGH TRANSPORTATION; CREATING YOUR PATH THROUGH YOUR OWN FOOTSTEPS

It's another Monday morning with similar pouring rain. I was held up for more than 10 minutes before getting on the road in front of the entrance of my residential district. Since Songhu Road went into construction, the original 5-minute drive would take over 30 minutes. At this moment, how I wish my vehicle were equipped with a pair of "invisible wings" which would take me out of despair.

I still remember my profound astonishment at the manned aircraft when I first watched Star Wars. I showed my admirations on several occasions that Star Wars simply harbors a pompous ambition in predicting the future of human existence, a future that might be too remote to reach. Innovation requires looking up into the cosmos, but it needs more practical, down-to-earth actions as well. In today's world of rapid developments of science and technology, the airbuses crisscrossing the universe in "The Fifth Element" and the omnipresent Sakaaran spacecrafts in "Thor: Ragnarok" are no longer science fiction. Even scenes of three-dimensional urban transportation network are approaching us in big strides.

Three-dimensional transportation sounds indeed like an extremely bold idea, judging from the current transportation. After all, the current self-driving zest is still at an experimental stage, and smart interconnection depends on the development of 5G. But technology always strikes us out of the blue. In recent years, relying on new technologies like ETC, electronic parking guidance, electronic self-service payment, China's smart traffic construction has entered the "express way." In addition, the promotion of intelligent transportation systems is extending into railway and civil aviation areas.

The year 2020 is a crucial year for the implementation of intelligent transportation system. The investment in and construction of the corresponding areas of intelligent transportation will drive market demand from both upstream and downstream industries, and provide the basic conditions and environment for applications of additional industries to develop. Thus, sectoral growth spurring industrial development will become a trend. Many enterprises have accelerated the development in the field of intelligent transportation. Shanghai Electric is one of them.

The year 2020 is destined to be an extraordinary year. The rich get richer and the poor get poorer. The Matthew effect of the market will become further intensified. And amid all of the uncertainties, opportunities may actually lurk, which await to be seized timely.

Fulfilling your dreams through transportation; creating your path through your own footsteps.

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ELECTRIC NEWS
BRIEF NEWS

Shanghai Electric Won Top of Top 20 Listed Electrical Equipment Companies Consecutively

On May 29, Energy magazine and "Pilot Think Tank" jointly released the "Top 20 Listed Companies of Electrical Equipment in 2020" list. Shanghai Electric won the top spot in this list for the third consecutive year.
As of the first quarter of this year, there were more than 250 Chinese electrical equipment companies listed in the mainland, Hong Kong and the United States, including some traditional electrical enterprises, as well as many new energy enterprises in terms of energy storage, photovoltaic and wind power. Among the top 20 listed companies in the electrical equipment sector, Shanghai Electric took a dominant and absolute leading position in terms of revenue scale, far exceeding other listed companies. In addition, Shanghai Electric is also at the top of the list in several key indicators such as market capitalization and net profit, with a comprehensive ranking at the top.

Shanghai Electric at "China Brand Day" on the Cloud

During May 10-12, with the theme of "Chinese brand, shared by the world; A well-off society in an all-round way and a quality life; Global epidemic fighting, brand power", the fourth "China Brand Day" was held in the form of online exhibition for the first time, meeting with the audience on the cloud.
As a model of "Made in Shanghai" brand, Shanghai Electric and many Shanghai time-honored brand enterprises have been invited to enter Shanghai Cloud-based Exhibition Hall.
This year's activities will take full advantage of the Internet platform. By using three-dimensional virtual reality and other technologies, adopting the form of online exhibition halls, and present in various forms such as VR experience halls, short videos and graphic presentations, the visitors can have in-depth cloud experience and in-depth interaction. During the cloud activity, Shanghai Electric, as the representative of the "national team" of China's equipment manufacturing industry and an attractive business card of "Made in Shanghai", actively demonstrated a series of achievements it has made to the whole society and presented its brand concept of "Green, environmental protection, intelligence and interconnection; Leading, reliable, energy-gathering, value-added".

National Demonstration Project: Successful Hydrostatic Test of Pingshan Boiler

On May 31, the hydrostatic test of the boiler of Shenneng Anhui Pingshan Power Plant Phase II Project was successful. During the test, all welded joints did not leak, and the pressurized parts of the boiler did not deform, rupture or leak. The completion of the hydrostatic test also marks the basic completion of the installation of boiler equipment.
Pingshan Phase II 1×1350MW Project is the world's largest single-unit high-low split-axis ultra-supercritical secondary reheating unit, with Shanghai Electric providing a complete set of main equipment. The boiler of this project adopts a double-shaft secondary intermediate reheat coal-fired generator set with world-class high-low arrangement, which is listed as a "national demonstration project" by the National Energy Administration.

Shanghai Electric High-speed Elevator Test Tower Structure is Roofed

On May 27, the construction project of Shanghai Mitsubishi Elevator's high-speed elevator test tower and core technology test platform was roofed. Upon completion of the project, it will become Shanghai's tallest elevator test tower with a height of 236 meters, which is also the tallest building in Minhang District.

The construction project of high-speed elevator test tower and core technology test platform is of great significance to Shanghai Mitsubishi Elevator. Upon completion, the new height of Shanghai Mitsubishi Elevator will be refreshed at one stroke. It provides a better hardware foundation for high-speed elevator research and development, technological innovation and sustainable development. Compared with medium and low-speed elevators, high-speed elevators involve more engineering disciplines, have high technical capability and are difficult to develop. They represent the commanding heights of elevator technology development and the comprehensive embodiment of elevator enterprise technology and strength.

The Design of Domestic Maximum Power Two-pole Motor Completed

Recently, Shanghai Electric Machinery Co., Ltd. has independently developed a 10000kW 10kV high-voltage and high-efficiency two-pole asynchronous motor with a maximum power in China, which has completed its overall design and is about to enter the manufacturing phase. The development of this motor fills the gap in the field of domestic high-power two-pole motors, realizes the localization substitution of imported products, and effectively seizes the market and technical commanding point.

The high-power two-pole motor is mainly suitable for the vast majority of loads such as compressors, fans, water pumps and the like, can be widely applied in the fields of air separation, steam-electricity dual-drive and the like, and has wide market space in overseas countries. After power-on optimization, the rotor design of this type of motor has made the motor efficiency reach the world-class level. Its vibration, noise and other indicators are assessed according to the national standards on special motor, and all key indicators reach the international leading level.

Shanghai Electric Wind Power Group Co., Ltd. Participates in Evaluation and Research on Implementation of Renewable Energy Law

A few days ago, the Renewable Energy Special Committee of China Energy Research Society sent a letter expressing gratitude to the Shanghai Electric Wind Power Group Co., Ltd. for its contribution to the "Evaluation and Research on Implementation of Renewable Energy Law".

Last January, the China Energy Research Society undertook the project of "Evaluation and Research on the Implementation of the Renewable Energy Law", a key strategic consulting project of the Chinese Academy of Engineering, to support the inspection of the implementation of the Renewable Energy Law by the Standing Committee of the National People's Congress. Shanghai Electric Wind Power Group Co., Ltd. participated in the preparation of the wind energy assessment report, gave strong support to the research on the implementation of the financial incentive mechanism, provided technical support and professional reference for law enforcement inspection, and played a positive role in further implementing the law and revising and improving the law in the future.

Shanghai Electric won the bid again for Zhejiang Petrochemical Phase II Seawater Desalination

After undertaking the 200,000-ton/day thermal seawater desalination project of Zhejiang Petrochemical Phase II, Shanghai Electric recently acquired another 960,000-ton/day seawater desalination pretreatment project of Zhejiang Petrochemical Phase II, which includes seawater desalination pretreatment in two stages of thermal process and membrane process.

The membrane process for the seawater desalination pretreatment project for Zhejiang Petrochemical Phase II will apply for the first time the large horizontal sand filter manufacturing technology developed by Shanghai Electric. The scale of global seawater desalination project is gradually developing from small and medium-sized to large-scale or even super-large-scale. Horizontal sand filtration, as a pretreatment process for large-scale membrane seawater desalination, has absolute advantages in cost over ultrafiltration process. This technology fills the blank of horizontal sand filtration design capability in large-scale membrane seawater desalination projects.

Shanghai Wuxi Turbine Blade Co., Ltd. High Pressure Turbine Guide Vane Developed Successfully

On May 14, the high-pressure turbine guide vane project developed by Shanghai Wuxi Turbine Blade Co., Ltd. successfully passed the expert review. The successful development of the blade is a milestone for Shanghai Wuxi Turbine Blade Co., Ltd. to transform into a "two-machine" hot-end turbine blade manufacturing industry player.

It is learned that the design requirements of the high-pressure guide vane assembly are very high, covering the whole set of hot parts processing technology, and it is recognized in the industry as one of the turbine guide vanes with the most difficult processing technology. Relying on the "National Energy Large Turbine Blade Research and Development Center" and the "National Enterprise Technology Center", Shanghai Wuxi Turbine Blade Co., Ltd. has set up a research team for hot component blade processing project, breaking through many technical bottlenecks such as grinding, electro-machining, welding and coating, marking a new step in the manufacturing capacity of Shanghai Wuxi Turbine Blade Co., Ltd.'s "two machines" turbine blades.

Star's Unmanned Rice Machine Sows Country Garden's Farm

Recently, the unmanned rice direct seeding machine developed by Shanghai Star successfully sowed the first batch of rice seeds at the "unmanned farm" of the Country Garden. The unmanned direct seeding machine can realize automatic field operation , pure field straight line operation unmanned driving, on-site monitoring of field turning unmanned driving and other operation testing through positioning, path planning, tracking, vehicle control, machine tool cooperative control and other technologies.

Shanghai Electric Power Generation Group won the bid for four 660MW electromechanical equipment for two power plants in Inner Mongolia

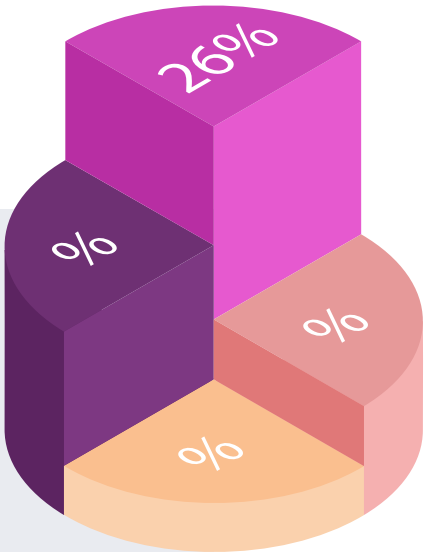
Recently, Shanghai Electric Power Generation Group has successively won the bid for two sets of 660MW ultra-supercritical steam turbine generators of SPIC Baiyinhua Kengkou Power Plant in Inner Mongolia and two sets of 660MW ultra-supercritical steam turbine generators in Inner Mongolia Mengtai Dongsheng Phase II. The Baiyinhua project is one of the four power supply points for the transmission of extra-high voltage direct current from Inner Mongolia to Taizhou, Jiangsu Province. It is also the first ultra-supercritical air-cooling model to be tendered for this year's coal and electricity project. Mengtai Dongsheng Phase II project is the first cooperation project between Shanghai Electric and Inner Mongolia Mengtai Group.

The Largest Lifting Appliance for Wind Power Engine Room in China Successfully Developed

The first engine room lifting appliance with maximum rated load developed independently by Shanghai Electric Wind Power Group Co., Ltd. has recently successfully lifted 6.25-172 units in Zhugensha project, completing the design transformation of lifting appliance from import to localization. This not only greatly reduces the cost of slings, but also breaks through the bottleneck of localization of large engine room slings and installation of small peak site slings.

The lifting appliance is independently developed by Shanghai Electric Wind Power Group Co., Ltd. based on technology-based cost reduction and accumulated years of offshore lifting experience through the joint efforts of departments such as quality, procurement, logistics center and labor service, and has obtained the national utility model patent certificate. The lifting appliance can realize the lifting weight of 500 tons, and the PLC closed-loop control can realize the function of automatically adjusting the lifting center of gravity, thus realizing the integral lifting of the engine room hub generator in only 30 minutes and greatly reducing the offshore lifting time.

Shanghai Electric Reports 26% Rise in Gross Revenue in 2019 Annual Results



Shanghai Electric, the world's leading manufacturer and supplier of power generation and industrial equipment, announced its audited results for the fiscal year ended December 31, 2019.

Key 2019 Financial and Operating Metrics Compared with the Preceding Year

- Gross revenue increased by 26% to RMB 127.509 billion
- Profit attributable to shareholders of the parent company increased by 24.83% to RMB 3.72 billion
- New orders increased by 30.6% to RMB170.79 billion
- Basic earnings per share is up 25% from RMB 0.20 to RMB 0.25
- Staffing in R&D increased to 3,124 personnel from 3082 with the total investment in R&D being RMB 4.102 billion

New orders for energy equipment, industrial equipment, and integrated services accounted for 33.2%, 26.7%, and 40.1% of the total new orders, respectively.

Rising by 12.1% in sales to RMB 45,944 million, the Energy Equipment Business Segment has continuously maintained steady performance, comprising coal-fired power generation equipment, power transmission and distribution equipment, gas-fired power generation equipment, nuclear power generation equipment, wind turbines and components, energy storage equipment, and high-end chemical equipment among others.

The sales derived from the Industrial Equipment Business Segment including elevators, medium and large-sized electric motors, intelligent manufacturing equipment, industrial basic parts, environmental protection equipment among others are up by 11.6% at RMB 46,409 million.

The Integrated Services Business Segment, encompassing the Energy Engineering Services, the Environmental Engineering Services, the Automation Engineering and Services, the Industrial Internet service, the Financial Services, and the International Trade Services, has an 83.5% increase in revenue up to RMB 44,316 million.

One of the notable highlights is the Company's achievement in its wind power equipment business, which has clinched the world's largest onshore wind turbines order for Inner Mongolia's Wulanchabu wind power base. Another significant accomplishment is the order for 39 sets of 4MW onshore wind turbines and towers from the NORINCO International Croatia project, marking its formal entry into the European wind power market.

As a project representative in the coal-fired power generation business unit, the Anhui Pingshan Power plant is poised to operate in late 2020 with its world record-breaking thermal efficiency at 48.92%. The breakthrough 1,350 MW ultra-supercritical double reheat power generation unit has helped in controlling global emissions of greenhouse gases for a more sustainable future by reducing the coal consumption for power generation to 251g/kWh.

To maintain the Company's leadership in energy-related products, Shanghai Electric has diversified

its business and invested into production of new types of batteries. The Company's independently developed and manufactured lithium iron phosphate battery is used at Beijing's Daxing International Airport, mobile energy storage system in Xiong'an New District that connects the grid, and power battery system for new energy bus are testament of strong demand in its order book.
In 2019, Shanghai Electric has launched the Industrial Internet to push the boundary of minds and machines. With the "Industrial Internet SEunicloud Platform", the Company is now providing a one-stop solution for wind power intelligent operation, thermal power remote operation and machine tool maintenance through the convergence of the global industrial system with the power of advanced computing, analytics, low-cost sensing and new levels of connectivity permitted by the Internet.
Shanghai Electric has been expanding its global reach with major progress of projects in the Middle East (Thar Coal Field and Power Plant Project), (Dubai 700 MW Concentrated Solar Power Plant Project), South Asia (Combined Cycle Power Plant (CCPP) Project in Bangladesh),South Australia, among other regions. The Company has also announced that it is to join the Expo 2020 Dubai as the official partner of the China Pavilion, demonstrating its global ambition.

The Construction Period of Suixi Biomass Thermal Power Project in Anhui Province is Advanced

When the Suixi biomass thermal power project in Anhui, which is contracted by Shanghai Electric Environmental Protection Group, resumed construction, while doing a good job in on-site epidemic prevention, it raced against time to complete the structural roofing of the main plant 15 days in advance. At present, all units in the site are under construction as planned, and grid-connected power generation is expected to be realized by the end of the year. The project was signed in August 2019 and officially launched on December 7 of the same year. The project has a construction scale of 130t/h high temperature and high pressure grate straw furnace, equipped with a 1×30MW extraction turbine generator set, and is the second biomass power plant built by Shanghai Electric Environmental Protection Group.

DEVELOP NEW MEDIUM-TRAFFIC-VOLUME VEHICLES TO MAKE TRAVELLING SMARTER

Shanghai Electric's Annual Corporate Social Responsibility Report Highlights 2019 Milestones

Shanghai Electric, the world's leading manufacturer and supplier of power generation and industrial equipment, released its 2019 Corporate Social Responsibility Report highlighting its commitment to corporate social responsibility and key advancements in 2019. The company's CSR strategies are designed not only to minimize the potential unfavorable impact of its products and operations, but also to activate the brand's purpose "Empower global industry, Make life smarter."

"It is a remarkable year for Shanghai Electric as the company has made major technological breakthroughs in many fields such as gas turbines, nuclear main pumps, high-efficiency clean coal power, offshore wind power, 3D printing, and flow batteries," said Shanghai Electric's Chairman and CEO Zheng Jianhua, "Our employees are always the primary driving force behind this and it is vital for us to strengthen the bond with our employees worldwide through effective reforms in profit sharing mechanism and human-centered management."

INNOVATION IN PROFIT SHARING MECHANISMS

To attract and retain talents, Shanghai Electric has adopted an equity incentive plan since May 2019. This consists of A-share restricted stock units, which have functioned as a supply-side stimulus to economic growth that benefits both employers and workers. Through the Plan, 2194 Shanghai Electric staff would receive performance incentives of a total of 134 million restricted stock units in the hope of reinforcing team effort and commitment.

DIGITAL TRANSFORMATION

Shanghai Electric has launched its Industrial Internet " SEunicloud Platform" to push the boundaries of minds and machines. The platform represents a significant step in the company's digital transformation. The emerging business units of Shanghai Electric, including storage batteries and intelligent manufacturing, have also scaled up by 30% through leveraging mergers and acquisitions, joint ventures, venture capital and increased R&D investment.

EHS PRACTICE

Aiming at protecting the safety of employees, Shanghai Electric has established a health and safety management system that benchmarks a variety of global occupational health and safety regulations. Eighty percent of the affiliated companies of Shanghai Electric had been certified with the Occupational Health and Safety Management Systems (OHSAS18001) by the end of 2019.
The Environmental Protection Committees have also been assembled in various regional markets worldwide to enhance the execution of the Environment Health Safety (EHS) guidance. They facilitate the company's ability to respond swiftly to risks such as the outbreak of coronavirus (EHS practice in Dubai 700 MW CSP + 250MW PV Hybrid project concentrated solar power plant). They have resulted in a proven record of success: fatal accidents and serious injuries rate in construction sites remain at zero throughout the previous year.

STRONGER COMMUNITY

With the "Employee Home" established in seven International engineering project sites outside China, Shanghai Electric has provided a communal arena for employees from distinctive cultural backgrounds to

communicate, socialize and entertain. It has also strengthened the bond between the company and the local residents as a multi-functional international community space.

GREEN & ENVIRONMENTAL PROTECTION

Shanghai Electric has implemented the "SEC-LOVE" system within the company to ensure all departments are aligned with an eco-friendly position. So far, 80% of the affiliated companies of Shanghai Electric had been certified with the ISO14001 Environmental Management System (EMS). Projects such as the Nantong waste incineration power project in Jiangsu, the Dongtai wind power station-in Jiangsu and the photovoltaic power station in Anhui Huaibei demonstrate the company's firm belief in the future of clean energy.

SOCIAL RESPONSIBILITY

In November 2019, Shanghai Electric donated teaching materials to the Managile Elementary School in Zubaidiya Town, Wassit Province. This represented another milestone in the company's progress toward being an active and enthusiastic force in development efforts that help the local community. At the end of 2019, Shanghai Electric's overseas business have employed over 4200 local workers worldwide. Following the pandemic outbreaks in January, Shanghai Electric has donated surgical masks to Fuji Electric Japan, the Wassit Thermal Power Plant in Iraq and the Thar Block-1 Integrated Coal Mine-Power Project, among others.

Shanghai Electric Guoxuan New Energy Technology Co., Ltd. Ranks 7th among National Energy Storage Integrators

The White Paper on Energy Storage Industry Research 2020 was officially released on May 20. Shanghai Electric Guoxuan New Energy Technology Co., Ltd. entered the top 10 national energy storage system integrators and ranked 7th. Shanghai Electric Guoxuan New Energy Technology Co., Ltd. has been focusing on the research and development, sales and service of lithium battery energy storage system products, realizing the full industrial chain coverage from battery raw materials to energy storage system, and providing customers with a one-stop intelligent energy storage system solution with high safety, long service life, high efficiency and intelligence since entering the field of energy storage in 2017.

The pilot application of prototype of intelligent steam turbine at Wuhe Power Plant

Li Lisha Xu Jiawen

"If you are equipped with a device, you can monitor various health indicators in real time. If there is any abnormality, it will be immediately fed back to the background system and the doctor will treat you immediately. Is this not only easy but also reassuring?" At present, the prototype of intelligent steam turbine with such a "Device" as its development concept has been successfully tested in the intelligent operation and maintenance project of Wuhe Biomass Power Plant.

The device can improve the operation efficiency and quality of operation and maintenance of the unit through on-line real-time monitoring and diagnosis of the unit system and key equipment, and finally realize the goals of high reliability, high safety and high efficiency of power plant operation.

Shanghai Electric Gas Turbine Co., Ltd. will install intelligent terminals on the user side of each power plant one after another in the future. All operation and maintenance data of the power plant will be stored in the intelligent terminals, which will be linked to Shanghai Electric's "nebula intelligence exchange" industrial Internet platform through communication means such as 5G network. The intelligent transformation of equipment operation and maintenance links will be realized through local or remote deployment of APPs.

It is learned that Shanghai Electric Gas Turbine Co., Ltd., relying on the "black technology" of the intelligent operation and maintenance application module, has achieved a sales amount of over RMB 10 million in more than one year from 2018 to 2019. It has opened the door to future smart power plants in the fields of large thermal power and biomass power generation.

Customers can know the real-time life of key components of steam turbine at any time by loading various applications. The optimal operation mode can be automatically calculated when the data is imported. When the data is abnormal, according to the cases in the database, it can identify the problems in time and provide maintenance suggestions; even before the failure occurs, users are informed in advance of the possible failure and the expected time through the trend of data change and the previous failure data samples of units, thus realizing the condition-based maintenance of the equipment.

The selection results of the 2019 Shanghai Science and Technology Award were unveiled at the Shanghai Municipal Science and Technology Award Conference on May 19. The conference commended the scientific and technological workers who have made outstanding contributions to Shanghai's scientific and technological innovation and modernization. Shanghai Electric won 8 awards, including the Special Prize for Scientific and Technological Progress.

Shanghai Science and Technology Award Unveiled & Shanghai Electric's 8 Awards This Year Have Super High Gold Content

Lu Le

Different from previous years, the award-winning projects this year further highlight the achievements Shanghai Electric has made in accelerating the industrial restructuring and the transformation of new and old kinetic energy under the guidance of the "Three-step" strategy, and vigorously cultivating strategic emerging industries. Shanghai Automation Instrumentation Co., Ltd., a subsidiary of Shanghai Electric (Group) Corporation, has won one of the city's two special awards for scientific and technological progress this year for its application of "Safe and reliable support technology for core control software of major industrial equipment". This project focused on the theory and technology of domestic intelligent control system for major equipment, aiming at promoting the quality of industrial software and ensuring the safety and credibility of high-end equipment control software. The results of this project have successfully supported a large number of important scientific research missions at the national level, such as the launch of "Fengyun-4" satellite, "Docking of Shenzhou-8 with Tiangong-1" and the "Lunar and terrestrial high-speed reentry vehicle" of the lunar exploration project. The project has not only successfully broken the foreign technological monopoly in this field, but also will greatly support China's economic transformation and upgrading in the future. It will play an important role in China's aviation, aerospace, rail transit and power control fields.

What is even more noteworthy is that all Shanghai Electric's awards this year are the first and second prizes with high gold content, which is the first time over the past decade. This also reflects from another aspect that Shanghai Electric has taken the national needs as a strategic pursuit, bravely undertook the important responsibilities and missions of national strength and national industry revitalization, and achieved remarkable results in promoting a new round of development with technological development, technological guidance and technological leadership.

It is learned that with the examination and review of the Shanghai Science and Technology Award Committee and the approval of Shanghai Municipal Government, there are 308 prizes (people) for the 2019 Shanghai Science and Technology Award.

Shanghai Electric Wind Power Group Co., Ltd. 8MW Black Start is Coming

Huang aiguo

At 11:08 on June 8, China's first 8.0 offshore wind turbine used “Black start" technology to generate its first power energy at Shantou Smart Base of Shanghai Electric Wind Power Group, marking the successful commissioning of the Group's smart energy demonstration project.

This is not only another new miracle created by Shanghai Electric, but also a milestone in the field of offshore wind power in China.

This project is China's largest and Shanghai Electric's first industrial park-level "energy Internet plus" demonstration project integrating wind, light and storage.

The project consists of one 8MW offshore wind turbine and one 4MW offshore wind turbine, 2.42MW roof photovoltaic, 2MWh energy storage, charging pile equipment, intelligent building monitoring, 5G+ industrial Internet system, microgrid control system, energy dispatching management platform, etc.

It is learned that the first prototype of Shanghai Electric's 8 MW offshore wind turbine was hoisted early this year. The COVID-19 epidemic has had certain impact on the construction progress of the smart energy demonstration project's delivery line and the overall project's formal integration into the network.

To realize the early commissioning and power generation of 8MW turbine, the Shanghai Electric Project Team boldly tried and carefully verified. Based on system modeling and simulation, it worked out detailed control strategies to overcome various world-class problems such as multi-voltage level conversion, power flow variability, voltage and reactive power control, power balance, etc., and started power generation with "Black start" technology.

The so-called “Black start” technology refers to the use of photovoltaic and energy storage systems in the smart energy project to power the fan without relying on the power grid to realize zero-start boosting and complete the first generation of the wind turbine.

Shanghai Electric won the first batch order of 8 MW offshore wind turbines in China in the 200 MW project in Area C of offshore wind farm off Changle, Fujian this March. The successful generation of the first unit has provided a necessary and timely prerequisite for the era of large-scale offshore megawatts.

Minhang Industrial Smart Energy Project Enters Trial Operation

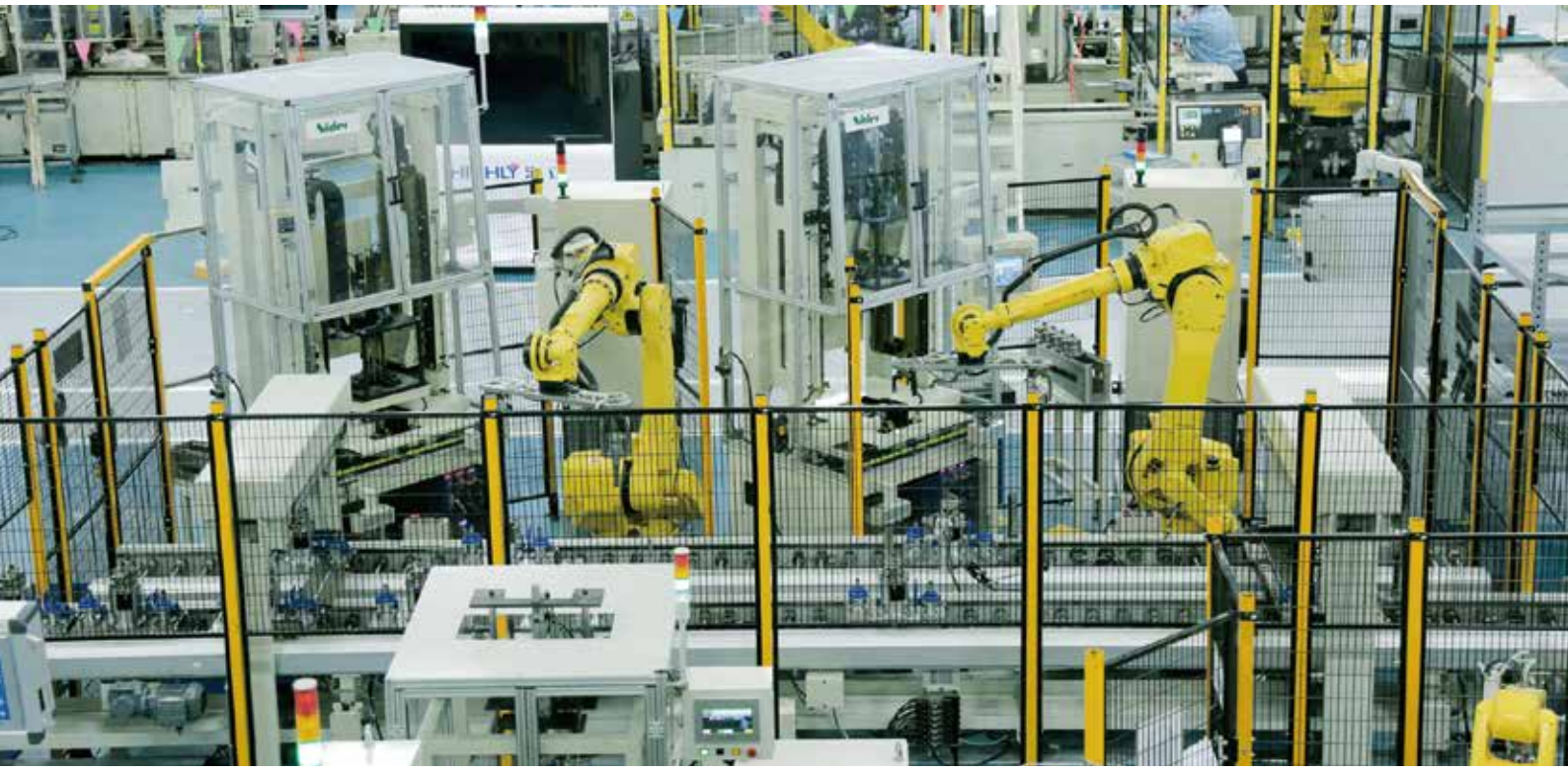
Guan Wanjin Fang Yuan

On May 18, Minhang Industrial Zone Smart Energy Demonstration Project (Phase I) was officially put into trial operation, making a final push towards full-scale commercial operation. This is the first industrial smart energy demonstration project of Shanghai Electric Power Station Group after the completion of the "Internet plus" smart energy demonstration project of Chongming Sanxing Rural Complex.

It is learned that the project consists of distributed power source, energy storage device, wind, light, integrated storage and charging pile, integrated energy intelligent management platform, etc., aiming to build a large-scale intelligent, green and low-carbon "wind, light, storage and charging" integrated energy model project in the industrial park.

In response to the rectification requirements put forward by the construction organization and the project supervision organization since the project started a complete set of supervision and inspection on May 14, the general contractor Shanghai Electric Power Generation Engineering Co., Ltd. acted quickly to overcome the impact of the epidemic on the work, effectively implemented the deployment of various tasks, and finally passed the inspection and acceptance by the start-up committee.

The project, jointly invested and constructed by State Grid Shanghai Integrated Energy Service Co., Ltd. and Shanghai Electric Group Co., Ltd., was located in the Shanghai Electric Power Plant Park and launched on September 25 last year. Renewable energy utilization, peak cutting and valley filling, demand control, etc. can be realized after the completion of the project, thus saving energy and increasing efficiency for the industrial park. D



Intelligent Factory of Shanghai Highly (Group) Co., Ltd. Won Two Annual Awards

Wang Qi

A few days ago, the domestic digital intelligent manufacturing professional portal e-works announced the results of the annual intelligent manufacturing excellent enterprise and practice case selection. The Intelligent Factory of Shanghai Highly (Group) Co., Ltd. under Shanghai Electric (Group) Corporation won the 2019 Best Practice Award for Intelligent Manufacturing and the 2020 China Benchmark Intelligent Factory.

In recent years, Highly Group has taken a firm step in the process of implementing intelligent manufacturing and summarized some valuable experience, thus improving the comprehensive competitiveness of enterprises. Since 2017, Highly has systematically carried out the construction of intelligent manufacturing on the basis of automation and informatization, developing towards digitalization, networking and intelligence, with the establishment of Nanchang Highly Intelligent Factory in 2018 as an important symbol. As a practitioner of corporate digital transformation, in the future, highly will use the data from "manufacturing" to "intelligent manufacturing" to create new growth driver, improve the enterprise industrial internet system, practice the compressor digital twin system, and realize the digital management of the whole process of Highly products.

It is learned that e-works Digital Enterprise Network is an influential enterprise information professional media and third-party service organization, focusing on knowledge dissemination, consultation and training, industrial research and international exchange in the field of intelligent manufacturing.

Shanghai Electric Enters Medical Waste Disposal Field for the First Time

Li Bo

On May 29, Shanghai Electric Environmental Protection Group won the bid for Foshan Medical Waste Disposal General Contracting Project (Phase I), which is also the first time that the Group enters the medical waste disposal field.

The total construction and disposal scale of the project is 35 tons per day, consisting of 25 tons per day in the first stage and 10 tons per day in the second stage. In the first phase of the project, a new medical incineration line with a daily disposal capacity of 25 tons and supporting facilities such as a main factory building with a daily capacity of 35 tons, a flue gas purification system, a sewage treatment station and other supporting public and auxiliary facilities will be built.

The bidding scope covers all engineering design, process design, equipment procurement, installation, commissioning, acceptance and other related services.

The project is located in economically developed areas of Guangdong Province, with a large scale and fierce competition in bidding. Shanghai Electric Environmental Protection Group has been investigating relevant technologies and equipment for medical waste disposal since 2015. In recent years, technical solutions have been formed for high-temperature cooking of medical waste, mixed burning of medical waste and hazardous waste, and separate pyrolysis, gasification and incineration of medical waste. To win the Foshan medical waste project, the Group began to carry out technical exchanges with the construction organization at the end of last year, especially several rounds of in-depth discussions around the technical route of "pyrolysis, gasification and incineration of medical waste" determined by the project, demonstrating Shanghai Electric's technical strength in this field. Meanwhile, the bidding documents were fully detailed to ensure that the whole proposal met the requirements for the bidding technology and construction period, and finally won the bid with great strength.

The winning of this project is of great significance to the development of Shanghai Electric's follow-up projects, the accumulation of achievements and the reserve of relevant technologies. The Environmental Protection Group will actively respond to the requirements of the construction organization for engineering construction based on the concept of "customer orientation" and strive to turn the project into a top-quality project.

It is learned that the project is planned to be commenced at the end of this month, ignited at the end of December and completed by the end of March 2021. D

DRIVEN BY NEW INFRASTRUCTURE, SMART TRANSPORTATION ON THE WAY

Planner | **Shen jin** **Tu min**

Since the beginning of 2020, "new infrastructure" has been under heated discussion. Guided by new development concepts, China has issued a number of policies to boost digital infrastructure construction based on information network with technological innovation as a main driver. Smart transportation has risen to be a focal point of attention as "new infrastructure" creates enormous opportunities. The future of smart transportation lies in how to build a closed loop linking passengers, vehicles, road and network by digital and information technologies to efficiently digitalize transportation infrastructure and intelligentize operation and maintenance.
Smart transportation, a major part of Shanghai Electric's digital strategy, has entered a "fast track" backed by multiple supportive factors.

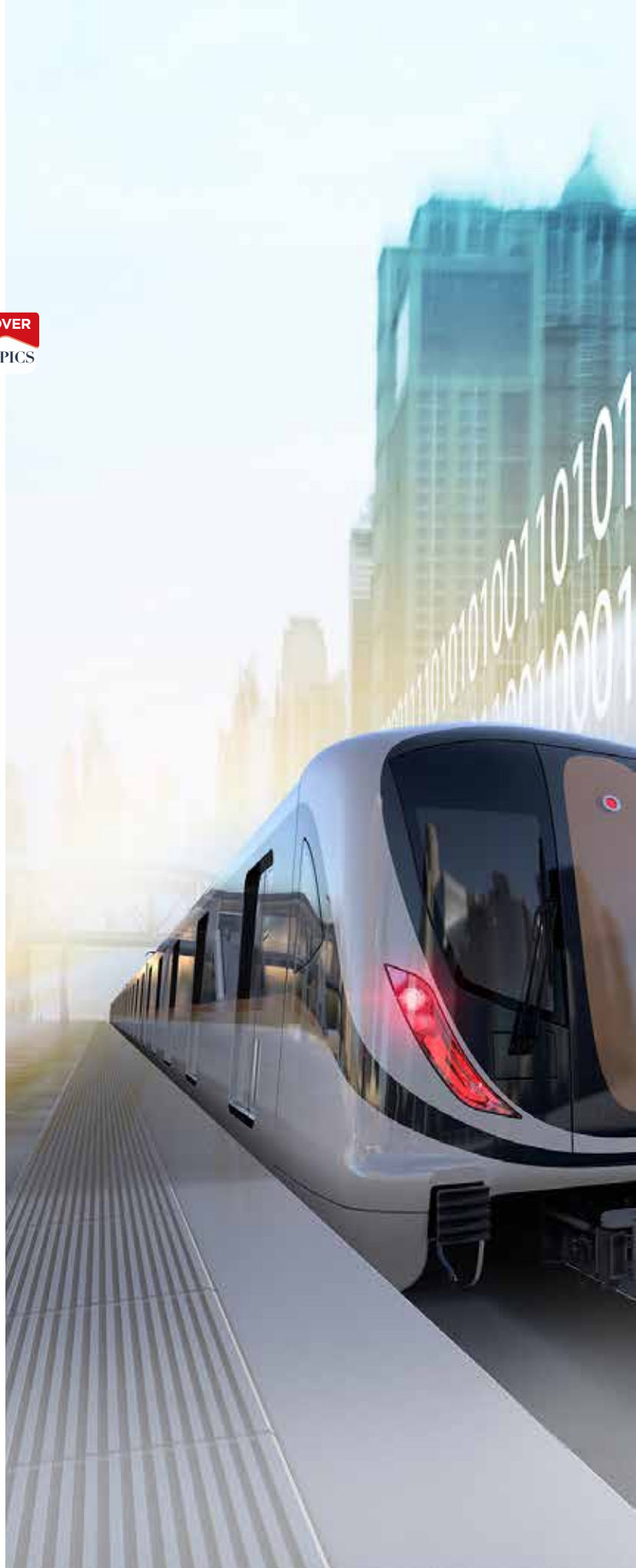
COVER TOPICS

DATA DRIVES SMART TRANSPORTATION

As more “new infrastructure” projects are launched, the smart transportation represented by “internet of city rail transit” is widely embraced by urban development in the internet age.

As a veteran in rail transit, Shanghai Electric is committed to explore new application of electricity via new green electricity, smart and digital technologies. It has placed great emphasis on driving industrial development in smart manufacturing and smart transportation sectors by new technologies like smart operation and maintenance, and unmanned driving, which enables itself to provide turnkey system solutions in terms of rail transit signaling system, comprehensive monitoring system, strong and weak electricity integration and general contracting of electromechanical equipment. In recent years, by leveraging its existing strengths in hardware production for subway and tramway and related software system development, Shanghai Electric has played an active role in developing rail transport comprehensive maintenance and significantly improved its system integration performance by making unpiloted driving, IERT, commuter rail, intercity transit and other new rail transit forms smarter.

In line with the national scheme of the “Yangtze River Delta integration”, Shanghai Electric has established close partnerships with urban planning, civil construction, design and electromechanical bodies with an open mindset. In addition, Shanghai Electric has progressively furthered its influence to the Zhujiang River Delta, Greater Bay Area (also known as Guangdong-Hong Kong-Macau Greater Bay Area), and even countries and regions in Southeast Asia, Africa and Latin America along the “One Belt One Road” Initiative, aiming to build its industrial chain and ecology of smart transportation.



DIGITAL CONTROL ENHANCES TRAINS WITH A "SMART BRAIN"

On 05:40 in the morning, the staff at Huinan Station on Line 16 activates the smart subway station interface on the computer on time after entering the controlling office. He/She clicks the "confirm" button for lighting, system self-check, communication self-check and other functions in sequence, and after about 5 minutes, the light is on, systems begin to run and the rolling door is opened. The station is started.

By leveraging big data, user experience has become a "touchstone" for the new operation model. In the past, staff had to arrive at the station more than an hour earlier before its scheduled opening time to inspect the station thoroughly and activate equipment. Today, the work efficiency is improved by around 20 times when all facilities are controlled by the computer. In addition, Huinan Station, a smart station on Line 16 in Shanghai, is able to limit the traffic and perform 360° monitoring simply by clicking a button.

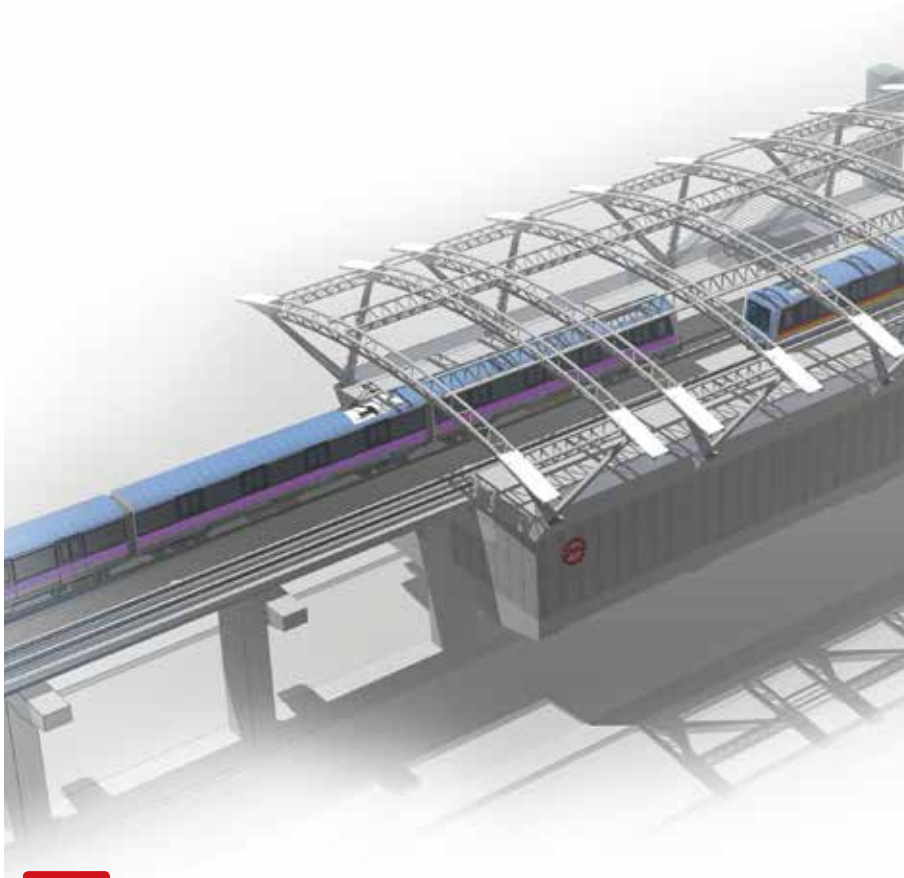
The smart station increases its operation and maintenance efficiency, and the smart signaling system secures the subway operation. The soaring number of trains has posed a huge challenge for the traditional signaling system. Shanghai Electric's automatic driving signaling system serves as a perfect solution, which is developed on basis of CBTC 2.0 signaling system. On top of existing signaling system embedded in trains, the new system supports real-time collection of accurate data in running trains by adding devices of sensors, GPS data collectors and high-performance cameras and data transmission to the calculation system of the smart station via IoT (Internet of Things) technology, allowing the algorithm to generate the maximum transportation capacity of line to ensure operation security.

Meanwhile, the visualized "housekeeper"-type management model is realized in subway operation and maintenance through wholly upgrading the monitoring system. The smart operation and maintenance system constructs accurate simulation 3D model of the station by information modeling (BIM) technology covering all devices including monitoring cameras, gate machines, ticket machines, elevators at the entrance and exit and facilities related with train operation, and displays the real-time equipment status on screens. Once a failure or fault occurs, the smart platform will give alarms, allowing staff to check the cause and shortening the repair time.

"Smart transportation empowers staff's sensory capabilities by breaking away from physical constrains, allowing them to detect failure in an earlier, faster and more accurate way." LU Xuezhong, Vice President of Shanghai Electric Automation Group/Shanghai Electric Rail Transit Group, explained with an example: "As for a set of bulbs, we are able to monitor how each bulb works and replaces it one day before it expires to ensure that all lights are on in the next day."

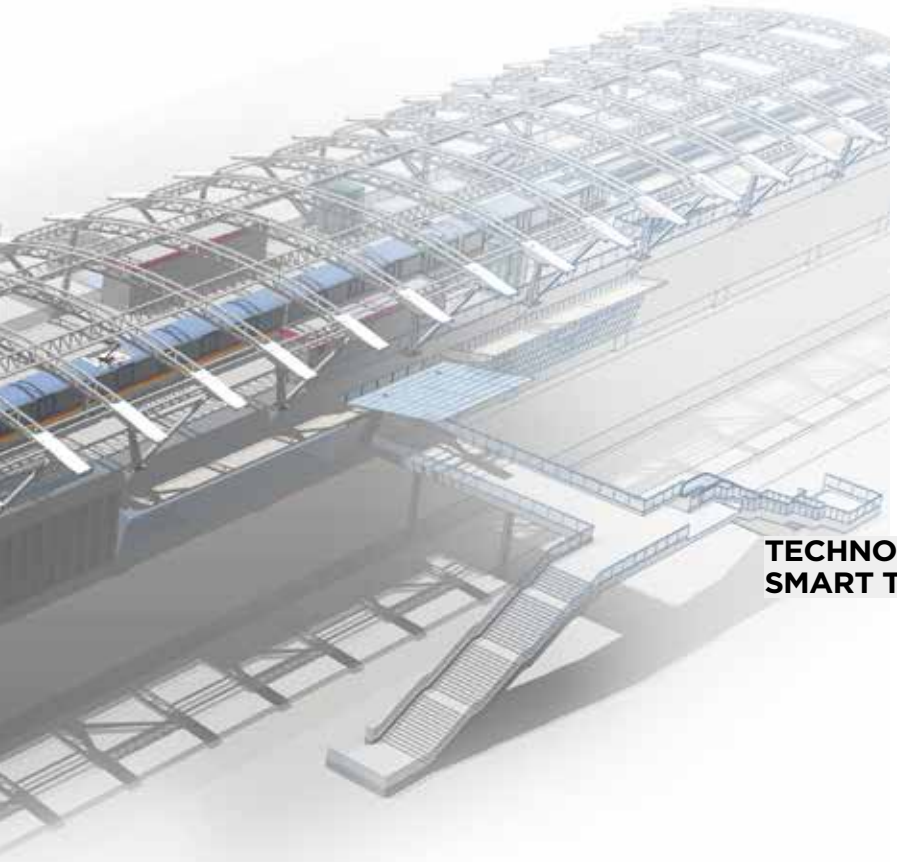
As the signaling and comprehensive monitoring system are becoming more and more smart in subway stations, an "smart brain" has come into being in rail-based trains.

REINFORCE COMPREHENSIVE MAINTENANCE TO ENSURE WHOLE-LIFE RAIL TRANSIT SECURITY



COVER TOPICS

With recent wining of the bid for smart operation and maintenance of Line 5 in Shanghai Metro network, Shanghai Electric is to provide whole-life smart comprehensive maintenance for special equipment including subway train, power supply and communication signal facilities in Line 5.
As of now, Shanghai Metro has over 5000 trains in operation, and the number would exceed 7000 by 2020. There are roughly 2000 subway trains requiring extensive repairing every year. Shanghai Municipal Rail Transit Development Plan (2035) has stated the goal of "Three 1000-kilometer" comprehensive rail transit networks in terms of subway, inter-city rail and tramcar (medium traffic volume). In this way, there would be more than 5000 trains in need of extensive repairing every year in the future, and the industry size will grow beyond 10 billion Yuan per year. It is estimated that the annual market value of rail transit equipment (including trains, communication signal, power supply and station facilities) maintenance in Shanghai is more than 15 billion Yuan, and this number for the Yangtze Delta (Shanghai included) reaches 40 billion Yuan, and China 200 billion Yuan.
In view of the huge market potential, Shanghai Electric Rail Transit Group has seized the strategic opportunity of building China into "a strong power in transportation", and deepened integration of big data, internet, AI (artificial intelligence), blockchain, supercomputing and other advanced technologies with the rail transit industry to transform from "production only" to "big data-based services".
Having accumulated rich experiences and expertise in urban rail transit sector, Shanghai Electric has developed a comprehensive industrial system incorporating trains, tractors, signal control system, comprehensive monitoring system, escalator, shield doors/ safety doors, power supply system, environmental control system and key components (bearings and high-strength fasteners), and all-rounded capacity in product design, production and services.
Based on its experiences in developing and applying Industrial Internet, Shanghai Electric has implemented online monitoring and remote operation and maintenance programs in multiple areas like wind power, thermal power, environmental protection, elevator and machine tool. Shanghai Electric has built an industry-leading line-level smart maintenance and health management network that integrates multiple professional segments and shares information from multiple sources, and connected "isolated islands" of operation and maintenance data scattered in train, power supply, rail, communication and signal systems. By removing all clogs in the data artery of the smart maintenance system of rail transit and



SMART TRANSPORTATION

TECHNOLOGY ACCELERATES SMART TRANSPORTATION

Smart city is widely seen as a combination of digital city and IoT (the Internet of Things). As a green, safe and convenient travelling method, urban rail transit plays an important role in facilitating the development of smart city.

On an early morning, the train fully loaded with passengers on Line 5 heads towards Shanghai Minhang Economic & Technological Development Zone, a comprehensive industrial base of smart manufacturing that integrates smart R&D, production and services. Line 5, orienting at a smart base, actually marks the first metro line in Shanghai.

"People working in Minhang are all familiar with Line 5, the only line leading to Shanghai Minhang Economic & Technological Development Zone. As our first project, it has been running for nearly 17 years since its pilot operation in 2003." The first project has left a deep impression on SONG Yinchuan, Deputy Chief Engineer of Shanghai CRC Rail Transportation Equipment Co., Ltd ("CRC Rail" for short), an affiliate of /Shanghai Electric Rail Transit Group.

Line 5 embarks the close collaboration between Shanghai Electric and Shanghai Shentong Metro Group. After more than a decade of effort, a new smart train is developed, which is also a ground breaker in terms of safety, comfort, energy conservation and environmental protection and smart operation performances.

Regarding travelling safety and comfort, Shanghai Electric adopts a range of state-of-the-art technologies including non-contact obstacle and/or derailment detection, radar-based protection system, smart monitoring and warning system in transit, operation and maintenance and tract detection to ensure operation security, and provides smart services to passengers via adding air purifiers, carriage temperature and carbon dioxide (CO_2) monitors, smart train windows and digital passenger service devices to provide

integrating IoV (the Internet of Vehicles) with digital image processing, Shanghai Electric performs real-time digital and visualized monitoring on key equipment, such as the travel unit, line, pantograph, signal system and station equipment, to ensure early warning, accurate detection and fast response against failures and faults, which reduces operation and maintenance cost, increases operation efficiency and provides comprehensive smart maintenance services to rail transit system in a secure and reliable manner.

Starting from Shanghai Metro networks, Shanghai Electric is committed to grow into a major supplier of maintenance services for the "Three 1000-kilometer" rail transit networks in Shanghai to meet goals of "local, independent and controllable" set in its corporate smart transportation strategy. While implementing daily maintenance by line and extensive repair of trains on a large scale, Shanghai Electric aims to guarantee secure operation of hyperscale rail transit networks in Shanghai, the Yangtze River Delta and even nationwide.

smart services to passengers. Regarding energy conservation and environmental protection, Shanghai electric introduces light complete carbon fiber body for trains, environmentally-friendly brake pad, smart lighting, permanent magnet traction and energy-saving air conditioning systems to largely enhance environmental performance. What's more important, it uses "four major" travel technologies for trains, which are smart operation and organization, smart environmental detection, smart control and smart status detection and adopts a number of sensors collecting audio, vibrancy and visual signals to formulate flexible train schedules and perform real-time monitoring, analysis, assessment and warning on travelling conditions including clearance, pantograph and catenary and wheel rail, which reinforces train operation security and maintenance efficiency. So far, CRC Rail produces trains and related equipment, and provides maintenance services to Line 1, Line 2, Line 3, Line 4, Line 5, Line 6, Line 8, Line 9, Line 10, Line 11, Line 15 and Line 17 and tramcars in Zhangjiang Hi-Tech Park. Besides its business in Shanghai, it also provides products and services to customers from other domestic provinces, and Argentina and Singapore.

"A manufacturer is expected to deliver satisfying services to customers, instead of selling products only." LU Xuezhong said candidly. Selling products is no more than one transaction with the customer, but at Shanghai Electric, buying products is only the beginning of the customer journey. On basis of product delivery, Shanghai Electric offers many additional services concerning product performance and maintenance. Due to IoT enabled by RFID and QR code, manufacturing data and process can be tracked across the whole production procedure. Therefore, Shanghai Electric is able to provide data-driven guidelines and suggestions to customers in the product's whole life cycle.

COVER TOPICS

SMART TRA

DEVELOP NEW MEDIUM-TRAFFIC-VOLUME VEHICLES TO MAKE TRAVELLING SMARTER

Smart transportation cannot be developed without taking passengers' experience into consideration. However, the subway network is not able to cover every location, especially in suburban areas and new development zones. Therefore, the connection between bus and subway systems often decides whether or not passengers can finish the "last mile" in a safe and convenient way. Such connection is expected to reduce running intervals in downtown areas as much as possible to enable passengers to travel in an easier and greener manner with the help of smart transportation.

The Intelligent Electronic Rail Transit, also known as IERT, is a system that uses advanced onboard sensing and control technology to deliver efficient automatic transport solution based on accurate navigation and positioning enabled by digital virtual track. In this way, it

NSPORTATION

achieves high security and efficiency for urban public transportation and accurate match between driving guidance and deployment and upgrades transportation control with a faster speed and lower cost.

With a sharp perception of the potential of this new technology, Shanghai Electric has built a joint team with TTT, a company based in the US, and Shanghai Urban Transport Design Institute Co., Ltd. to co-develop programs with regard to popular car models in China, right of way in mixed traffic, variation characteristics of passenger flow, intelligent deployment system and signal control system since 2013, and has formulated all-rounded solutions covering technology research, project design, construction and operation. In December 2017, the Lingang pilot electric rail line in Shanghai Electric Lingang Base started its trial operation after fulfilling the project completion and acceptance, indicating that the new IERT system, embracing advantages of both rail transit and buses, was successfully inaugurated.

At present, IERT system has emerged as a strong competitor in medium-traffic-volume transportation due to its strengths in construction, operation, maintenance and ongoing costs. Compared with tramcars, traditional steel rails are replaced by digital virtual rails since IERT has few new infrastructure, wide choice of vehicle systems and less damage to original municipal facilities, shows adaptability in project construction, flexibility in operation and low construction and operation cost; In addition to agile scheduling and remarkable compatibility with passenger flow, it occupies less road resources under same conditions, which makes traveling more reliable, comfortable and secure; At the same time, the IERT system, an important application of AI (artificial intelligence) technology in transportation, is embedded with core technologies of autopilot and vehicle infrastructure integration to make vehicles, roads and operation smarter with optimized costs. In the future, IERT will develop into the mainstream of smart transportation and provide best and most convenient services to customers for daily life, business and production purposes regardless of weather or ground condition.

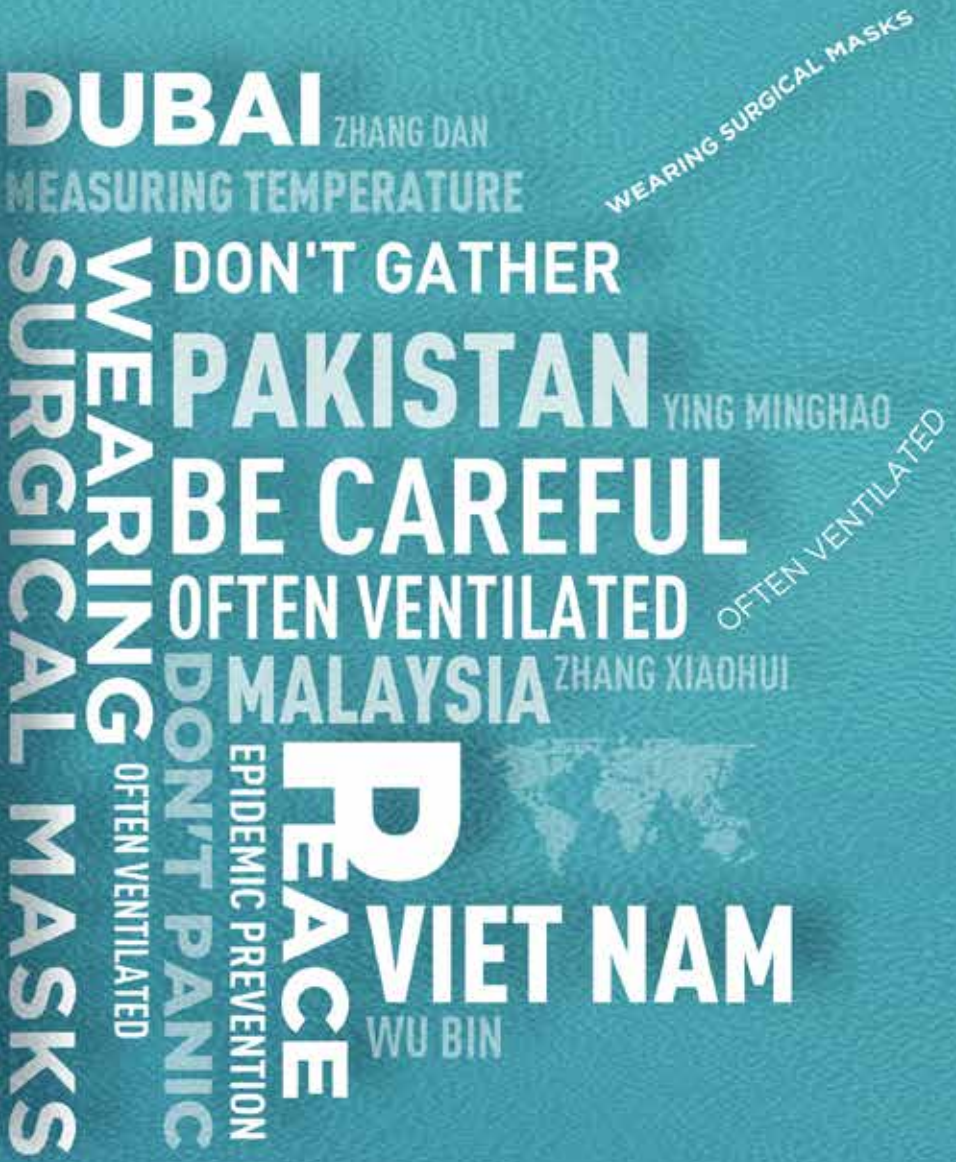
As “new infrastructure” strategy is being implemented, it is foreseeable that Shanghai Electric is evolving to “high-quality transit service provider” from “infrastructure construction operator” in line with its “data”-centered and “service”-driven smart transportation landscape. Meanwhile, Shanghai Electric makes significant contributions in leveraging transport structure and urban space structure through continuous concept innovations and technological breakthroughs to revolutionize rail transit.

Pleasant traveling for people and smooth transportation for goods. The age of smart transportation, accelerated by data, is within our sight.

SHANGHAI ELECTRIC: OUR COWORKERS, AS EXPATS IN OVERSEAS OFFICES OR SITES,

MAKE A DIFFERENCE DURING THE PANDEMIC

Planner | **Tu min**



Many of our coworkers working as expats remain at the front line although the Covid-19 has disrupted the construction progress in many overseas sites. Facing up to all kinds of challenges tenaciously and responsibly, they have achieved personal-realization and become exemplary figures, thus epitomizing the Chinese saying: "A person's tenacity is revealed through difficulties, just like a perfect jade is finished off through polishing".

Ying minghao

PIONEER IN THE UNDEREXPLORED PAKISTAN MARKET

China and Pakistan, bonded by a comprehensive strategic partnership, celebrated the 69th anniversary of the establishment of diplomatic relations on May 21, 2020.

On this day, Ying Minghao, assistant general manager of the Thar Project under the Power Plant Engineering Company of Shanghai Electric, was overwhelmed by a plethora of text messages, WeChat messages, and emails on the inter-state amity. He said that "As an expat, I'm representing Shanghai Electric, a Chinese company."

Under a development contract entered into in 2019, this Thar Block-1 Coal-electricity Integration Project will build a 2*660MW supercritical coal power plant and a 140 km2 lignite open-pit coal mine with an estimated reserve of about 3.8 billion tons, producing 7.8 million tons of lignite annually.

The coal mine is located in the Thar coalfield, near the Thar Desert in the southeastern Sindh province. Three hundred and sixty kilometers away from the country's biggest city, Karachi, the coalfield is the largest one ever discovered in Pakistan. Its 9,100 km2 coal area has around 175 billion tons of lignite reserves. Currently, 13 development blocks have been designated here.

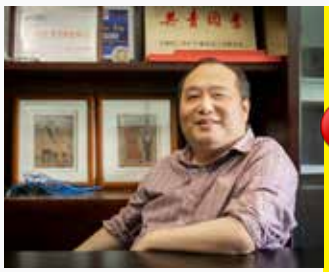
The Thar Coal-electricity Integration Project, as a flagship energy project promoted by Shanghai Electric under the umbrella of the China-Pakistan Economic Corridor (CPEC), helps to expand the company's international energy investment and development market, as it is the first coal-electricity integration project that involves investment, development, EPC, operation, and maintenance.

This overseas project is a signature project for Shanghai Electric and is relevant to the company's overseas fame, which is why Ying Minghao highly regards his participation in it. "I was among the first to contact the local authorities, including Pakistan's Central Power Purchasing Agency (CPPA), and communicate between them and the headquarters in Shanghai. I am confident because I have done something similar in China." The pandemic, unexpectedly, brought about a curfew that forced foreigners to self-isolate. "I came to Islamabad on February 19, which is far away from the Thar coalfield, and I do not have colleagues by my side." Fortunately, with sufficient knowledge of epidemic prevention, Ying self-isolated as soon as possible, and contacted with the company to prepare the application materials for the extension of the "dalutiao" (the approval issued by the General Office of the National Development and Reform Commission for the preliminary work of projects) of the Thar project and materials for financing closure...

To deliver a good result, Ying decided to focus

on his language proficiency and knowledge about Pakistani culture. On the one hand, he made great efforts to learn English expressions involved in the project, especially those related to financing and legal affairs. With better English proficiency, he has communicated with local authorities and regularly reports the project progress to the Economic and Commercial Counsellor's Office of the Chinese Embassy. He regularly submits project progress reports to local authorities, such as the Ministry of Energy of Pakistan, the Private Power and Infrastructure Board (PPIB), and the CPPA.
On the other hand, he is familiar with the knowledge about local culture, he said: "In this month of Ramadan, business communication may as well be avoided. During this period, they will not eat or drink from 3 am until 6 or 7 pm. Because of fasting, they do not have the energy to work, nor are they in the mood to do so."
After the curfew was lifted, Ying has been maintaining a balance between work, living, and studying. His application to the PPIB on the extension of LOS has been confirmed; he submitted relevant financing documents to the PPIB applying for financing closure confirmation and Pakistani sovereignty guarantee; he also coordinated the approval of project interface drawings with the Distribution Company (DISCO). Besides, he has set out to establish a project office in Islamabad and started to recruit new employees. "Ying is a pioneer that plays many roles," remarked Meng Donghai, chief of the Division of Commerce of Power Plant Engineering Company of Shanghai Electric.
Ying has been encountered with numerous difficulties ranging from communicating with local authorities to preparing for setting up an office, and even maintaining health during the pandemic. Every day there are new problems, new challenges and he overcome them. "As an expat in Pakistan, I represent the company, and the country as well." he said.
Just as what he said when he chose to join Shanghai Electric "Shanghai Electric is an enterprise integrating advanced technology and high-end talents., and his life goal is the same as the company's corporate values, which is to constantly pursue excellence and surpass himself.

DEDICATION TO EXPANDING THE VIETNAM MARKET



Wu bin

Wu Bin is the general manager of Shanghai Electric Vietnam Co., Ltd. When the epidemic swept China, he was spending the Spring Festival in Shanghai.
Considering the operation of the Vietnam office, he decided to leave for Vietnam.
After booking a plane ticket to Hanoi for February 2nd, he canceled it on February 1st for fear that the flight might be canceled in no time, and planned to go via the Youyi Guan checkpoint in the border province Guangxi. After arriving at the capital city of Guangxi by air, he took a cab and headed to the checkpoint, only to find many people stranded there because it was closed half an hour ago. He opted to follow two businessmen to go through a less-known checkpoint, but an unexpected accident caused another delay: this checkpoint was closed 10 minutes before their arrival. He was obliged to take the last flight of that day back to Shanghai. Compared to the short annual leaves during the past 20 years, his stay in Shanghai this year is the longest.

Joining the company 32 years ago, the 55-year-old Wu started to work in the Vietnam office 20 years ago, when his child was only 3 years old. Six years later, he got the first EPC power engineering project in Vietnam, which is also the first overseas EPC project of the company. As the third chief representative in the Vietnam office, he knows that exploring a new market in Vietnam requires full preparation and that overseas projects call for long-term efforts. "The first representative contracted Parkinson's disease and had a linguistic disorder after spending a long time in Vietnam without anybody to talk to."

Previously working for the Shanghai Electric Import and Export Corporation, Wu managed to open up the market in Vietnam through flexible marketing methods. This know-how won him the title of the company's "Excellent Exporter". In October 1999, he was designated to explore the market in Vietnam as the chief representative of the Vietnam office.

In the first year, to understand the market in Vietnam faster, he visited many customers in the power industry and seek business opportunities from the predecessors of the power industry. He concluded that mutual understanding is key to launching projects and that the knowledge of commodities of both sides is key to exploring the market in Vietnam. "The year 2000 coincided with the Sydney Olympic Games, but I was too busy to know anything about it, let alone the number of gold medals the Chinese team won." In 2001, Wu found a profitable opportunity when he visited clients and governmental promotion fairs: the transformation of thermal power plants. The first project of this kind was on the 20-year-old Pha Lai plant, fully financed and built with the Soviet money and experts. The plant needed an overhaul and equipment replacement, and Wu won the project for two reasons: 1. Lower freight costs, as Shanghai is geographically closer to Vietnam than Russia. 2. Preparation in advance. Wu knew the tender at a business conference and had more time in preparing the bid than other Chinese competitors who started to translate the jargon-loaded Vietnamese tender after it was officially issued. Winning the bid helps to expand the market in Vietnam for the company. The owner of the project not only recognized the reliability and stability of the company's products, but has also introduced other clients to Wu, making it possible for him to win projects of large-scale power plants.

In 2003, as Ruan Jinyong, the then Prime Minister of Vietnam would visit Shanghai in his state visit to China, Wu sought to make the company known among Vietnamese senior officials by recommending the company to the Chinese Embassy in Vietnam. Meanwhile, Shanghai Electric was recognized by the Shanghai Overseas Office of the Vietnamese Embassy, and was included in the itinerary of the Prime Minister's delegate team. In late October, the Prime Minister's visit to the company's steam turbine plant, boiler plant, generator plant, and Wujing Power Plant was broadcast live by the Vietnamese Television, and the Prime Minister also expressed his intention to introduce the company's products into Vietnam, which was seen by Wu as boosting the company's presence in Vietnam. Later on, progresses seemed to come by with less difficulty. In 2005, the Vietnamese Prime Minister designated Shanghai Electric as the EPC contractor for the 300MW*2 coal power project, phase I and II, in Tinh Quang Ninh. In September 2009, the company won the bid for the EPC project of the 622MW*2 coal power project phase II in Vinh Tan, which is the first 600MW-level power plant that Vietnam has ever constructed. It indicates that China-made power plant and engineering construction technology began to occupy the high-end power technology market in Vietnam, and that the Chinese technology and standards of power plants are generally welcome in Vietnam. In September 2019, Shanghai Electric signed the first overseas EPC photovoltaic project, in Vietnam again: Forte PV Project.

The 20-year arduous work in Vietnam has made Wu prudent, reliable, wise, pioneering, adventurous, and mindful of lessons and experience. As an explorer of the market in Vietnam, he aligns his decision with the goals of the company's development and exudes great dedication to the company and its future growth.

Zhang tong

AN ARDENT YOUNG EXPAT IN DUBAI

Zhang Tong is the regional manager of the Middle East and North Africa office of the company. Coming from Chuzhou, Anhui, the 27-year-old is one of the female employees in the company's NE1-700MW CSP+250MW PV Hybrid Project. She is a typical Generation Y: talented, and has a wide range of interests.

As a university student of the School of Arabic Studies at Beijing Foreign Studies University (BFSU), Zhang Tong participated in arranging the visits, talks, and banquets attended by Arab officials studying in China and served as an interpreter in Rwanda and the UAE before she graduated in 2019. "What I did at BFSU prepares me for exploring the Middle East market and participating in business negotiations." As a clear-minded, logical, and candid person, Zhang is interested in not only the Arab language but also law, travel, jogging, and yoga. She can fully leverage her language proficiency while enjoying her interests in her post as a business manager.

Zhang has been staying in the project in Dubai for the past 3 months or more since February 26. To be sure, spending a long time overseas is common among expats, but the only difference for her is that her once fair skin has been irradiated by the passionate Mediterranean sun. "The company is the EPC contractor of this project, in which I communicate with the owner to compile the contract and attachments. My preparations are key to its construction. I am also tracking the progress of another project and preparing for the tender, as the owner has decided on the deadline for bidding." Because of the outbreak, Zhang has been residing in the project office and usually visits the construction site. "The pandemic allows me with more time to visit the construction site and know about the construction, which helps me to be more realistic in bidding and negotiations."

Because of this, Zhang has known the complexity of obtaining a certain license before the construction starts: it may take 1 to 2 months to collect documents

and data drawings, and to coordinate with the authorities and the owner, before the license is issued. Zhang thus has better knowledge about how to ensure the project progress is on track by properly dealing with the relationship with colleagues from different sectors and that with the owner, clients, and suppliers.

Bored and nostalgic as she feels, Zhang is unaffected by the downside of working abroad. Her willingness to learn and diligence is also recognized by her coworkers, who find Zhang's professionalism, candidness, and enthusiasm respectable.

"Staying in Dubai makes me aware of how distinct the Chinese and Arab cultures are. The experience of working and living here is conducive for me to becoming a better self."

When asked, by a friend, about if she regrets choosing this job, Zhang responded by quoting Thoreau: "I went to the woods because I wished to live deliberately, to front only the essential facts of life, and see if I could not learn what it had to teach, and not, when I came to die, discover that I had not lived."

MAKE MALAYSIA MORE BEAUTIFUL

Luxuriant vegetation characterizes the Sarawak state of Malaysia, which is home to hornbills. In a country where the temperature regularly tops 25 or 30 celsius degrees, Zhang Xiaohui usually investigates and patrols the construction site and check materials with on-site engineers under the burning sun or by breaking through jungles. With such a terrible working condition, the occasional occurrence of rare vegetation or birds is soothing for him.

Zhang Xiaohui has been responsible for the start-up, design, procurement, and implementation of two projects owned by Sarawak Energy Berhad (SEB) in north Miri province in northeast Sarawak: 1. the 73-kilometer-long 275kV transmission line projects from Marudi to Bunut, part of the main transmission network, in which he serves as

Zhang xiaohui

the project deputy manager, and 2. the Bunut 275/33kV substation, an important hub of the main transmission network in the region, in which he serves as the project manager. However, the construction progress of the two ongoing projects was affected by the national lockdown since March 18.

Despite the lockdown measures and the construction suspension, “we should fully prepare for the resumption of work.” Considering that most of the materials were stored at the on-site material station, Zhang and the on-site engineer have been paroling and checking the site and the materials every day, while ensuring that the site camp and the material station are closed. “Wasn’t it for the outbreak, the substation should have been near completion.”

Zhang Xiaohui started working in Malaysia in 2014, when he joined the 500kV line project, that is, the first 500kV high voltage line project of Shanghai Electric Power Transmission & Distribution Group. Zhang was particular about the details of the project, including the construction process, progress, on-site safety, quality assurance, communication with the owner, market inquiry, contract clause, and archiving. Spending 4 years in a row on the project site, he has become a project manager by combining what he learned at university and what he experienced on the site.

Zhang’s aspiration and audacity help him become an experienced and capable manager, and he still recalls Chairman Zheng Jianhua’s words: hard work makes a difference. He aspires to become a better self and fully unleash his potential through concrete efforts.

Zhang is looking forward to the lift of lockdown measures when people are as free as the local hornbills. He believes that it would not be too long before he can cast off the mask, enjoy the green mountains and lush vegetation, and make Malaysia more beautiful.

Chen shenglu

SUCCESS BELONGS TO THOSE WHO STICK TOGETHER THROUGH THICK AND THIN

"Chen Hao from the on-site office sent an email today, and he detailed the content of the company's video conference yesterday." While watching the content of the video conference in the email, Chen Shenglu lamented the convenience of the Internet. Chen Shenglu joined the Shanghai Electric Power Transmission & Distribution Group in 2017, and, aspiring for a richer experience, he joined the first overseas project in his life: the company's BDWC substation project in Ethiopia. Grateful to the company for offering young employees opportunities for personal development, he has become a backbone in the company during the past three years.

Chen works in the EPC project of the BDWC-1/LOT3A substation, a supporting power supply project for an industrial park. The project will build a 400/230/33/15kV Woldiya II substation and a 400/230/33kV Combolcha III substation, and will expand the two-line intervals of the 400kV Bahir Dar II substation and the two-line intervals of the 230kV Combolcha II substation. Chen had been tirelessly working on the project site before the outbreak, with the sole hope to complete the project as soon as possible, and he has since spent nearly half a year on the site. In March, faced with the difficulty of having no forklifts to unload the 32 containers of equipment racks sent from China, he resorted to his coworkers in China and managed to unload the cargos with a loader. He led the unloading work in the stuffy container in order not to cause damage, lower the unloading costs, and ensure the safety and integrity of the cargos.

After the pandemic fanner out, Chen has concentrated on the health of all coworkers and focused on epidemic prevention and control by suspending the construction work from April 6. The project department adopts closed management, prohibits personnel entry and exit, and cuts off the path of viral infection.. "The headquarters has sent us masks and thermometers, and our coworkers managed to buy 84 disinfectant liquid and hand sanitizer from Ethiopia-based Chinese pharmaceutical manufacturers." Chen is thus grateful to the company's support, which makes his

colleagues devoted to epidemic prevention and control."
Every day, Chen joins his colleagues in collecting epidemic-related information and policies, reminding each other and their family to maintain good personal hygiene, registering personal information in case of contact tracing, distributing masks, monitoring body temperature, disseminating knowledge of epidemic prevention among all coworkers, and regularly disinfecting offices and residence.
To Chen's surprise, the company also sent a package of epidemic prevention materials to his family. "I was worried about my family because I was not by their side and not able to look after them, but the company is so kind that it sent them epidemic prevention materials. Although my flight to China in April has been canceled, I can at least feel at ease." For this reason, he believes that success belongs to those who share, from top to bottom, in one purpose, and to those who stick together through thick and thin.

WHAT IS A SURGICAL ROBOT?

Surgeries by robots, as perceived by many people, are somewhat a "high-end" medical technology only found in science fiction movies. It is novel and also fills our mind with questions: "Are such surgical robots also used in daily surgeries? Would the operation be as accurate as manual ones?"

Actually, with multidisciplinary developments such as computer technology, minimally invasive surgery technology and medical imaging technology, the research and application of surgical robots have become rather extensive. In clinical practice, robots are used to perform basic operations covering all surgical fields, with satisfactory application cases in general surgery, cardiac surgery, urology, gynecology, otolaryngology, plastic surgery, neurosurgery, and orthopedics, etc.

Surgical robot is an application that embraces a variety of technical means such as precision medicine and mechanical engineering and serves to assist doctors in clinical surgeries. It is usually composed of a doctor console, a robot arm system and 3D imaging software. By operation objects and functions, there are two kinds of surgical robots: da Vinci surgical robots for soft tissues and Mako orthopedic surgical robots for hard tissues.

Traditional surgeries, even the simplest ones, usually require two to three surgeons, an anesthesiologist and several nurses, let alone some large-scale operations, such as craniotomy, which may need nearly more than 10 medical staff. Yet the application of robots can greatly reduce the number of operators in operating rooms, thereby cutting down surgical costs. Meanwhile, surgical robots can relieve the terminal tremor through a sophisticated control algorithm, helping to solve accuracy problems caused by doctors' hand quiver in traditional surgeries; the end actuator carried by a surgical robot can be very delicate, and may enter narrow spaces that cannot be accessed by traditional surgeries. Thus, featuring smaller wound surface and improved recovery speed, surgical robots have won wide popularity among patients.

Through decades of application, surgical robot's economic and medical value have been generally recognized. According to relevant data, its market size has reached USD 3.2 billion in 2014, and is expected to be USD 20 billion by 2021. The da Vinci surgical robot developed by the robot giant, Intuitive Surgical, for example, has performed over 5 million operations worldwide. Although North America is the main market for surgical robots currently, the market shares in emerging markets such as Asia will grow increasingly in the future. The research and development of domestic surgical robots has also won support from an array of scientific research institutes and enterprises at home. The "TiRobot®" orthopedic robotic system developed by Beijing TINAVI Medical Technology Co., Ltd. and the "Remebot" navigation & orientation robot for neurosurgery offered by Beijing Remebot, as representative results in this field, have all passed the CFDA inspection and been approved to enter market. Following the trend of domestic surgical robots, the surgical robot team of Central Academe of Shanghai Electric Group Co., Ltd. focuses on the development of surgical robots for joint replacement. And the products developed have passed the medical device testing, which are in the stage of clinical research.

Surgical robots, varying from one to another, have made themselves a ready helper for doctors, and shown their value in the medical field. With the increasing aging of society and people's more intense demand for medical quality, there will be more robot-assisted surgeries. In the future, more high-tech surgical robots adopting 5G technology, AR technology and other new and high technologies will be applied in clinical environment to provide higher quality medical services for patients .

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