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SHANGHAI ELECTRIC 上海电气

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SHANGHAI ELECTRIC'S NUCLEAR POWER BUSINESS EPITOMIZES ITS HIGH-END EQUIPMENT MANUFACTURING.

上海电气 SHANGHAI ELECTRIC

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CORE COMPETENCIES

A lady in the neighborhood goes out to work early and comes home late every day, even though she is 63 years old. Once I bumped into her in the elevator and chatted with her, surprisingly knowing that she is employed by several companies. The reason she is so popular in the market is that she has been working in finance since she graduated from school and is very proficient in financial reporting. She went to night college in her thirties and graduate school in her forties, and also obtained CPA and auditor certificates. After retirement, she was still sought after by several companies as a consultant. She said she had complained about her work when she was young, thinking that it was boring to be buried in numbers in a small room every day. However, decades of serious work and continuous learning have enabled her to develop considerable expertise. That is her core competence.

I once followed my roommate to a public economics class where the professor lectured on how to run a business. He shared a concept that still sticks in my mind: core competencies.

Core competencies are long-term experience and unreplaceable advantages accumulated with focus. There are many excellent German SMEs with unique technologies that have been able to operate for hundreds of years and stand up to the competition. Several generations have dedicated themselves to running a small company and achieving global leadership in a single technology. It's a noble pursuit to not take small things lightly. They believe it's valuable and to be proud to do small things well.

We are familiar with Lei Jun's quote: "We can make pigs fly into the sky as long as we seize the opportunities given by the trends." However, we can't just rely on opportunities to run a business or our property rights. Enterprises should be concerned about how to build and strengthen their core competencies and create value with them so as to grow sustainably. Core competencies are companies' unique advantages.

Whether running a business or living a life, as long as you concentrate on one thing, it will have an irreplaceable value even if it's very small. That is the core competency.

My grandma used to say, "You have to be steady in everything you do, and don't be impatient. Be a person with true strength." She doesn't know words like "core competency", nor does she say "be a person with long-term vision". But her philosophy is the essence of cultivating core competencies. We should not be hurry to win at the beginning, because life is a marathon.

There are too many dreamy stories about overnight success in our era, that people are having illusions. Is it that not becoming famous at an early age means a wasted life? Does it imply mediocrity if a company does not enter the Fortune 500? Are we doomed to be knocked out by the times if we don't enter the profit-making industries?

I do not believe in these opinions. There are numerous companies in the world, and no matter which sector you are in, you can have your own core competencies. When you are a little better than most of your peers in a certain aspect, you have gained the core competency to ensure the survival of your business.

In his book, economist Xue Zhaofeng, a featured guest on the talk show Qi Pa Shuo, suggests that instead of waiting for others to help us, we should help ourselves; we should not demand respect from others, but ask ourselves what we can do for others.

The most important formula for success is self-improvement. We need to increase our investment in ourselves and improve our capabilities. In short, we need to keep educating ourselves and engage in lifelong learning.

ELECTRIC SHANGHAI 上海电气

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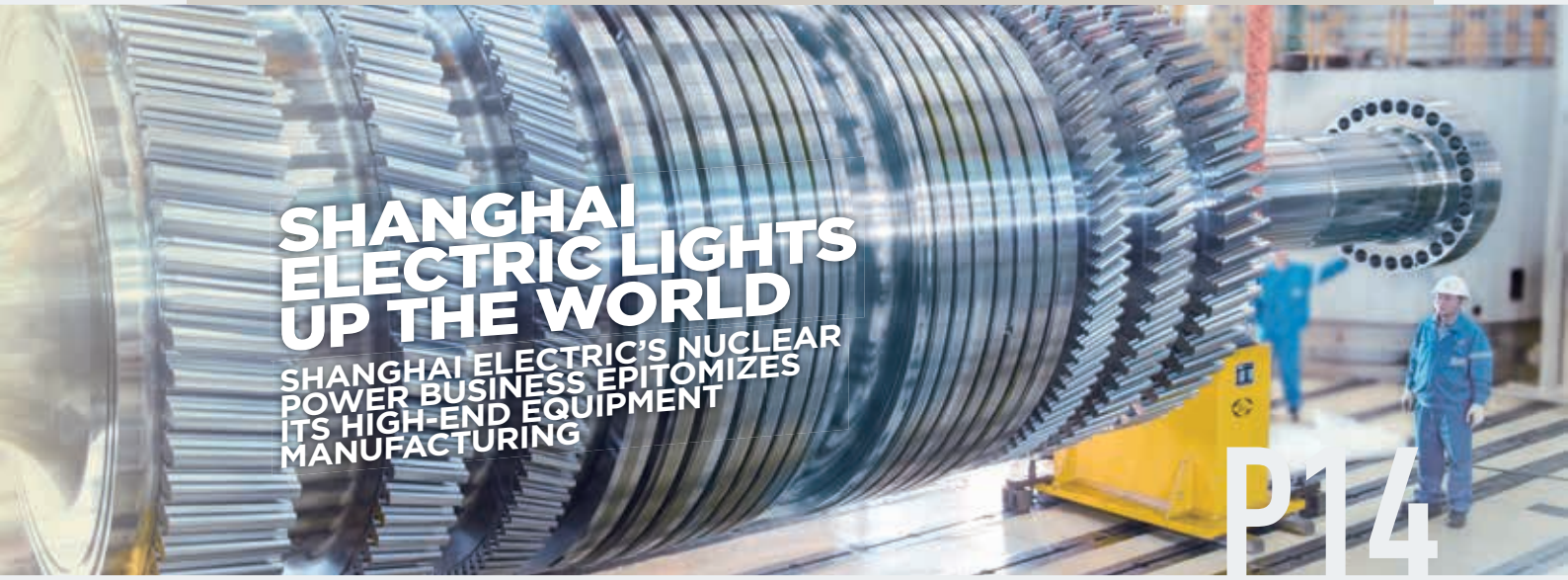

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BRIEF NEWS

Shanghai Electric Ranked 28th among 2021 China's Top Overseas Power Project Contractors

The China Chamber of Commerce for Import and Export of Machinery and Electronic Equipment (CCCME) published the "2021 China's Top Overseas Power Project Contractors". Shanghai Electric ranked in the 28th place, with 8th place in the field of solar energy (photovoltaic), 11th in power transmission and transformation, and 20th in new energy. In 2021, Chinese enterprises reportedly entered into 667 contracts for overseas power projects, with a total contract value of $50.28 billion, up 14.1% year-on-year. The ranking will further enhance the brand image and industry influence of Shanghai Electric in the power industry and effectively help it consolidate and expand its presence in overseas power markets.

Highly Nanchang* Selected as National Industrial Internet Pilot Demonstration Project

Nanchang Highly Electrical Appliance Co., Ltd. ("Highly Nanchang") was recently selected as a 2021 National Industrial Internet Pilot Demonstration Project and rated as the champion cultivation enterprise of a single event in Jiangxi Province, which fully demonstrates the company's position and technological strength in compressor manufacturing. Highly Nanchang*'s "Industrial Internet Platform & Supply Chain Collaborative Solution" successfully solves the problems of low transparency, disconnected data chain, low logistics efficiency, imbalance between material supply and demand, and uncontrollable inventory risk in the traditional manufacturing industry, meeting the requirements of procurement management, raw material product traceability, storage & logistics scheduling and tracking, inventory management and other typical scenarios for supply chain collaboration. The solution also brings together upstream and downstream procurement data, production data and sales data to create a collaborative supply chain solution with online and offline synergy covering collaborative procurement, real-time tracking, dynamic scheduling, efficient delivery and intelligent warning.

Two Companies of Shanghai Electric Become First-level Enterprise of National Safety Production Standardization

Recently, the Ministry of Emergency Management of the PRC announced the list of "2021 First-level Enterprises for Standardization of Safe Production in Industry and Trade Sector", 74 enterprises, including Shanghai Mitsubishi Elevator and Shanghai Electric Power Generation Equipment's Turbine Works, were selected after several assessments and screenings. The honor signifies that the two companies have reached a new height in production standardization. Shanghai Electric will continue to enhance the safety education for employees, strengthen the efficiency of the accountability system, increase the investment in safety and security, and promote safety production to deliver even better products and services to customers.

Shanghai Electric Nuclear Power Group Becomes a Member of Guohe One Alliance

On February 28th, China's advanced nuclear power technology brand named "Guohe One", which represents the most advanced level of Gen III nuclear power technology, was established in Shanghai. As one of the founding members of the alliance, Shanghai Electric Nuclear Power Group shared its experience and expectations for cooperation on behalf of the member companies at the event. The alliance is an unincorporated non-profit organization jointly built by domestic organizations engaged in CAP1400 (Guohe One) nuclear power technology R&D, design, equipment manufacturing, bulk material supply, civil construction, installation, commissioning and operation with independent legal personality. The alliance will play a leading role in technology and build a number of platforms dedicated to the modern industry chain to further boost China's nuclear power industry in the 14th Five Plan period.

Shanghai Electric's Several Companies and Individuals Awarded the “Shanghai Nuclear Power” Brand Contribution Award

Recently, the Shanghai Nuclear Power Office held the 2022 Shanghai Nuclear Power Work Conference and the Shanghai Nuclear Industry Party Building Alliance Work Conference, where organizations and individuals who have made outstanding contributions to the "Shanghai Nuclear Power" brand in 2021 were presented with awards. Shanghai Electric Power Generation Group and Shanghai Electric Nuclear Power Group and other 10 enterprises were awarded the "Shanghai Nuclear Power" Brand Contribution Award for Organizations, and 18 people, including Xu Longqing from Shanghai Electric Power Generation Group and Zhang Maolong and Li Tianbin from Shanghai Electric Nuclear Power Group, received the "Shanghai Nuclear Power" Brand Contribution Award for Individuals. Shanghai Electric will firmly follow the requirements of the Shanghai Municipal Commission of Economy and Informatization to "adhere to the high-quality development of nuclear power and strengthen the brand of Shanghai Nuclear Power", seeking progress in a balanced manner, innovating while inheriting the tradition, continuously advancing the construction of nuclear safety culture, standardizing the manufacturing of nuclear power equipment and improving the quality of nuclear power products.

Shanghai Electric's Thar Block-1 Integrated Project Wins Several Awards in Pakistan

The 14th CSR (Corporate Social Responsibility) Summit was organized by the National Forum for Environment & Health (NFEH) of Pakistan recently. Shanghai Electric's Thar Block-1 power project was awarded the CSR Award, while its Thar Block-1 coal mine project won the Public Health and Safety Award, Social Responsibility Award for Education, Community Service Award and Green Power Leadership Award. The Thar Power Project Department supported the local people's livelihood in various ways, provided pandemic prevention materials to local residents timely when the COVID-19 pandemic outbroke, and proactively realized the full immunization coverage of basic vaccines for Chinese and Pakistani employees. Besides, the project department also completed the relocation of nearly 500 indigenous families around Thar Block-1, providing accommodation and basic living security for the residents, and established the "Thar Chinese Teaching Center" with the Confucius Institute of the University of Karachi to provide free education of Chinese language for the residents and Pakistani employees of the project.

Shanghai Electric Power Transmission & Distribution Engineering Wins First Bid for High-end EPC Project in West Malaysia

Recently, Shanghai Electric Power Transmission & Distribution Engineering won the bid for the design, supply and installation of a 132kV substation at the Kulim Hi-tech Park in Malaysia by AT&S. The total investment in the project is the highest ever made by a foreign enterprise in Malaysia in the past 10 years; it has been given great priority by the Malaysian government. The successful bid for the project not only represents the recognition of the company by the world-renowned electronic chip and semiconductor manufacturer, but also the first breakthrough of the company in the high-end industrial market in West Malaysia. It is the first project in West Malaysia since the company entered the Malaysian market in 2014, laying a solid foundation for its full penetration into the Malaysian market.

Shanghai Electric Helps Igniting for the Boiler of Thai Binh 2 Thermal Power Plant Unit 1

On February 23rd, local time, unit 1 of the Thai Binh 2 power plant was successfully ignited, and Deputy Prime Minister of Vietnam Le Van Thanh was present to witness the ignition moment. The total capacity of the project is 1200MW, with Shanghai Electric SHMP Pulverizing & Special Equipment providing equipment including the coal mill and Qingdao Huachen Weiye Electric Power Technology Engineering responsible for debugging, performance testing, commissioning and other related work. After being put into use, the project will provide an annual power supply of about 7.2 billion kW.h to Vietnam.

Overseas Energy Storage Project Launched with Contract Signing Online

On March 28th, Shanghai Electric Guoxuan New Energy Technology, a subsidiary of Shanghai Electric Power Generation Group based in Nantong, signed a contract online with Pacific Green Technologies, a US-listed company, for the UK REP1&2 energy storage project, announcing the launch of the project.

It is the first overseas large-scale energy storage project of Shanghai Electric Power Generation Group, located in Ridgeborough Energy Park, Kent, UK. It is divided into two sites with a total capacity of 100MW/100MWH. As the energy storage integrator, Guoxuan provides the complete energy storage system solution for the project. At present, the two companies have already started the project design and expect to deliver the first batch of supplies in the third quarter of 2022. Despite the impact of the pandemic, teams of Guoxuan and Pacific Green Technologies in Shanghai and the UK actively engaged in communications of all sorts, and sealed all documents and entered the implementation phase in March. The project is an important milestone for both sides. We will devote our best resources and strive to overcome the difficulties posed by the pandemic to ensure the completion of the project on schedule.

Shanghai Electric Gains New Export Orders

Fusheng Electrical Appliance, a subsidiary of Shanghai Highly Group, has signed a long-term supply agreement with the US-based Tecumseh Products Company. After the agreement takes effect, Fusheng Electrical Appliance* will export an additional 400,000 sets of motors for commercial freezer compressors* each year, increasing sales revenue by about CNY 100 million and generating USD 16 million in foreign exchange. The cooperation will enhance the company's global influence and visibility, and diversified customers will provide a more balanced stream of orders and improve the competitiveness of the company.

Shanghai Mitsubishi Elevator Contributes to the Success of the Beijing Winter Olympic Games, Winter Paralympic Games and the "Two Sessions"

On March 11th, the national “Two Sessions" successfully concluded. With a firm political stance, a strong sense of social responsibility and a resolute corporate purpose, the Beijing branch of Shanghai Mitsubishi Elevator has successfully completed the elevator service for the Beijing Winter Olympic Games, the Winter Paralympic Games and the "Two Sessions". Since February this year, the team members strictly enforced 24/7 emergency duty, and devoted 14 people to the on-site support team for the "Two Sessions", 18 people to the on-site support team for the Winter Olympic Games and the Winter Paralympic Games, and more than 130 people to the back-office support. The company also invested nearly CNY 1.2 million worth of equipment for up to 6 enterprises stationed in the Two Sessions; a total of 110 elevators, including 86 elevators for venues of 8 enterprises such as the Winter Olympic venues, press and media center, hospital, conference center, and hotels.

Shanghai Electric Power Generation Group Wins Bids on Double Reheat Facilities for Two Projects in Zhejiang

Recently, Shanghai Electric Power Generation Group has won bids for the boiler equipment of Zhoushan Phase III 2×660MW expansion project by CHN Energy's Zhejiang branch and the steam turbine generator of Zheneng Liuheng Power Plant Phase II 2×1000MW project. The Zhoushan Phase III project is the first 660MW double reheat project in Zhejiang Province; the Liuheng Phase II project is the first 1,000MW thermal power project to start bidding in 2022, and the first megawatt double reheat project for Zhejiang Energy Group and Zhejiang Province. The signing of the two projects further enhances Shanghai Electric's leading position in double reheat technology. The projects are scheduled to be put into operation in March and October 2024 respectively.

Shanghai Electric Digital Eco-Tech Shortlisted for Top 10 Enterprises and Popularity Award at IoT Star Awards

Recently, the 2021 IoT Star Awards were announced. Shanghai Electric Digital Eco-Tech has developed a number of water quality sensors to meet the needs of the intelligent water industry for micro, digital and intelligent sensors with systematic, networked and multi-parameter integration, and obtained several core technologies based on its application platform. In this regard, the company was shortlisted as one of the "Top 10 Enterprises" and received the Popularity Award. As an intelligent water solution provider, Shanghai Electric Digital Eco-Tech focuses on the intelligent water industry, possessing capabilities in IT system consulting, design and software development, as well as strong capabilities in software and hardware integration.

Shanghai Electric Joins Hands with Different Parties to Explore Efficient Energy Use

Strategic Cooperation Agreement on Coal-Fired Power and Liquid Sunshine Coupling Engineering Research and Application Signed

On March 10, the "Seminar on Sustainable Development of Coal-Fired Power for Carbon Peaking and Carbon Neutrality & Project Signing Ceremony", co-organized by Shanghai Electric Group and Shanghai ICT Developer Energy Technology, was held under the sponsorship of Shanghai Institute of Cleantech Innovation. Zhou Qiang, Deputy Director of Shanghai Municipal Development and Reform Commission, and Chen Rong, Vice Mayor of Songjiang District, sent their congratulatory video messages.

With the rapid development of new energy, the sustainable development of coal-fired power is facing challenges and opportunities brought by new technologies, such as the coupling of new energy and traditional coal-fired power, low-cost hydrogen production by new energy, and the nationwide deployment of liquid sunshine projects, which require the in-depth involvement and integration of resources from the whole society. As an equipment manufacturer deeply engaged in new energy and coal-fired power, Shanghai Electric hopes to promote the implementation and incubation of such a major strategic project together with all parties involved, and promises to work closely with them to create a multi-win and sustainable cooperation model. By combining the technological advantages of all parties, the company will make use of hydrogen from renewable energy to realize the industrialization of carbon capture, clean coal utilization, conversion of CO_2 to methanol and other chemicals as soon as possible, and contribute to the realization of China's carbon peaking and carbon neutrality goals.

Shanghai Boiler Works and Shanghai Electric Wind Power Group gave keynote speeches on CO_2 Capture Technologies and Applications and The Role of New Energy in Carbon Neutrality respectively at the seminar.

During the Seminar, China Energy Engineering Corporation Limited Hydrogen Energy Technology, Northwest Electric Power Design Institute of China Power Engineering Consulting Group, Shanghai Boiler Works, Shanghai Electric Wind Power Group, Shanghai ICT Developer Energy Technology, Jiangsu GCL New Energy Holding, Spang Technology, Shaanxi Coal Group Yulin Chemical, and Shanghai Shaanxi Coal High-tech Research Institute jointly signed a strategic cooperation framework agreement on Peak-shaving for Coal-fired Power Units and Liquid Sunshine (Green Hydrogen - Carbon Capture - Methanol) Coupling Engineering Research and Application. With the goal of efficient energy utilization, the companies will focus on emerging fields such as hydrogen energy, liquid sunshine, carbon capture, non-electric utilization of renewable energy, distributed energy, and integrated smart energy, share market information and resources, carry out active technological cooperation, and promote the study of technologies with significant industrial prospects and the application of demonstration projects.

With the theme of sustainable development of coal-fired power for carbon peaking and carbon neutrality, the seminar invited top scientists, famous entrepreneurs, leaders of local governments and professional organizations to discuss topics such as key technology R&D and industrial strategies, talent cultivation and domestic and international cooperation, and explore the path for sustainable development of coal-fired power.

A HIGHLIGHT OF CHINA!

World's Fourth Hualong One Unit Connected to Grid with Shanghai Electric's Support

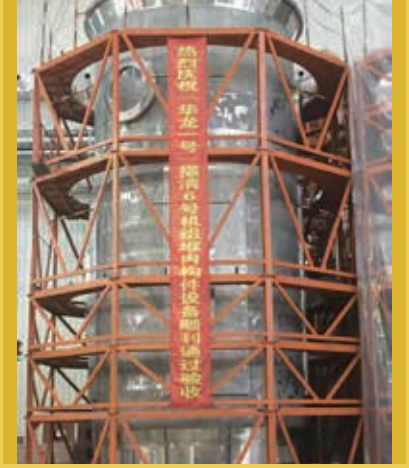
On March 4, local time, Unit 3 of the Karachi (K-3) nuclear power plant in Pakistan, the world's fourth Hualong One Reactor, was connected to the grid, laying a solid foundation for the subsequent operation of the unit. Shanghai Electric is the supplier of the nuclear island and the conventional island's main equipment. With this, all four units of the Hualong One demonstration project are connected to the grid.

Unit 2 and 3 of the Karachi nuclear power plant in Pakistan, with China Zhongyuan Engineering Corporation as the general contractor and Shanghai Electric as a partner, adopt China's third-generation pressurized water reactor (PWR) nuclear power technology with full intellectual property rights. It is the first Hualong One demonstration project outside of China and the first Hualong One nuclear power plant built in a foreign country, which is of unique significance to the energy cooperation between China and Pakistan. As an important achievement of the "China-Pakistan Economic Corridor" and the "Belt and Road" initiative, it is a landmark project to promote China's national strategy of exporting nuclear energy globally and the largest cooperation project under construction between China and Pakistan. It is also a concrete initiative for China and Pakistan to deepen their comprehensive strategic partnership in the new era, adhere to green development, jointly address climate change, contribute to the carbon peaking and carbon neutrality goals, and collaborate to build an energy community with a shared future for mankind with nuclear power as a bond. It has boosted the confidence of countries along the Belt and Road in Hualong One.

Shanghai No.1 Machine Tool Works, a subsidiary of Shanghai Electric Nuclear Power Group, manufactured the reactor vessel internals in the nuclear island main equipment, as well as PMC equipment such as loading and unloading machines and fuel loading devices. Since the company started the design of Hualong One reactor vessel internals, it took 33 months to tackle 71 processing and testing problems, localized two kinds of materials, innovated many technologies including four on welding, four on testing and six on processing, and obtained ten invention patents. Finally, the manufacturing, processing, assembly, testing and welding of Hualong One reactor vessel internals, and the design and manufacturing of technological equipment for acceptance tests, have been fully indigenized.

Shanghai Electric Power Generation Equipment's Turbine Works, Shanghai Electric Power Generation Equipment's Generator Plant, Shanghai Power Plant Auxiliary Machine Factory and Shanghai Electric Power Generation Engineering manufactured the steam turbine, generator, steam-water separator and other core equipment for the conventional island, and were responsible for the overall layout design of the turbine generator unit for the first time.

It was reported that the K2 Unit of the project had been successfully put into commercial operation last year and completed 100 hours of continuous stable operation, with all performance indicators meeting the standards and the unit functioning well. After completion, each Hualong One unit is expected to generate about 9 billion kW.h of power annually, which can meet the annual power demand of more than 4 million households in Pakistan, equivalent to an annual reduction of 3.12 million tons of standard coal consumption and 8.16 million tons of CO_2 emissions, or planting more than 70 million trees.



Fuqing Nuclear Power UNIT 6

Ready for Commercial Operation with the Contribution of Shanghai Electric

At 15:36 on March 25, Unit 6 of Fuqing Nuclear Power Plant, the second unit of the Hualong One demonstration project, completed 168 hours of trial operation and was qualified for commercial operation. Shanghai Electric participated in its construction. To date, the Hualong One demonstration project, China's third-generation nuclear power technology, fully completed and put into operation, marking China's nuclear power technology and comprehensive strength to obtain world-class status and supporting China to evolve from a big player to a powerful one in the nuclear technology industry.

As the highlight of China's nuclear power, Hualong One is one of the most widely accepted third-generation nuclear power models in the world. It is a third-generation PWR nuclear power innovation with full intellectual property rights developed and designed by China's nuclear power enterprises, which meets the highest international safety standards and bulk construction requirements, and has become the preferred third-generation nuclear power solution globally.

On March 21 and 22, 2019, the reactor vessel internals of Unit 6 of Fuqing Nuclear Power Plant, manufactured by Shanghai No.1 Machine Tool Works, a subsidiary of Shanghai Electric Nuclear Power Group, has passed the final acceptance, laying a solid foundation for the development and completion of Hualong One demonstration project. During the manufacturing process, Shanghai No.1 Machine Tool Works drew on the manufacturing experience of the reactor vessel internals of Unit 5 of Fuqing Nuclear Power Plant, the first Hualong One reactor, and strived for perfection. The company applied for 2 new patents and achieved full indigenization of product manufacturing, processing, assembly, welding, testing and special tool design and manufacturing.

Reactor vessel internals are the "backbone" of the nuclear reactor and the core equipment for its safe operation, mainly providing reliable support for the nuclear fuel assembly of the reactor core, bearing all the loads of the core components, and offering the precise positioning and standard coolant flow channels for all kinds of core measurement and control devices, which can effectively prevent the occurrence of nuclear safety accidents. The manufacturing of Hualong One reactor vessel internals is difficult and requires high precision. After years of R&D and experience accumulation, Shanghai No.1 Machine Tool Works has developed a set of core technologies for precision machining, precision welding and precision assembly; its product quality and technology have reached an internationally advanced level, setting the direction for the development of manufacturing technology for reactor vessel internals.

Unit 5 and 6 of Fuqing Nuclear Power Plant are part of the Hualong One demonstration project. The reactor vessel internals of Unit 5, which was manufactured by Shanghai No.1 Machine Tool Works, passed the acceptance on March 15, 2018, and the unit was put into commercial operation in January 2021. After the full completion of the Hualong One demonstration project, the annual power generation capacity of the two units will reach 20 billion kW.h, equivalent to an annual reduction of 6.24 million tons of standard coal consumption and 16.32 million tons of carbon dioxide emissions, or planting 140 million trees. It is of great significance to optimize China's energy structure, promote green and low-carbon development, and promote the achievement of carbon peaking and carbon neutrality goals.

News Perspective of Shanghai Media Group Focuses on Highly* Intelligent Manufacturing

Recently, News Perspective, a column of Shanghai Media Group's STV, reported on "the wave of returning" of manufacturers in Shanghai, highlighting the intelligent manufacturing of Shanghai Highly (Group) Co., Ltd.* (hereinafter referred to as "Highly"). As a leader in the compressor market in China, Highly* has unleashed its huge potential due to its years' endeavor towards digital and smart transformation, which improves the efficiency in the use of land, reduces labor cost and shortage through robots, and increases products' added value by expanding into the R&D of high-end compressors commissioned on trucks, base stations, and other non-household scenarios.

Shanghai Electric
Won the Bid for the Seawater Desalination Project with a Daily Output of
160,000 TONS

Recently, Shanghai Electric Power Station Auxiliary Equipment Works won the bid for Shandong Yulong Petrochemical seawater desalination project with a daily output of 160,000 tons, marking a good start for the marketing of seawater desalination in 2022. It was also a great victory of Shanghai Electric, which attached great importance to both pandemic control and production.

Bidding negotiations were conducted at the critical stage of COVID-19 prevention and control in Shanghai. The management of Shanghai Electric Power Generation Equipment Co., Ltd. Power Station Auxiliary Equipment Works paid high attention to the negotiations, and established the special working group to work against time and the pandemic. The special working group, making full use of telephone, e-mail, WeChat, cloud video and other means, strengthened the communication with the customer through online presentation, telephone negotiation and video meeting. In addition, considering the lock-down policy, the working group assigned responsible personnel to the bidding site in advance, proposed countermeasures against all difficulties and uncontrollable factors in prediction, and formulated a well thought-out bidding program. Through unremitting efforts, Shanghai Electric had been highly recognized by the customer for its organizational capability, service attitude and excellent technical program, and therefore gained the order and signed the contract with the customer online. In particular, Shanghai government announced the lock-down of Pudong and Punan on the evening of March 27; and, within only one hour and a half, the Party Committee of the Auxiliary Equipment Works assembled 110 Party members and masses from Manufacturing Department, Process Department, Technological Development Department, Planned Logistics Office and General Manager's Office to work at the front line and implement closed-loop management, in order to strictly prevent and control the pandemic and meanwhile guarantee the smooth production and operation of the company.

By winning this bid, Shanghai Electric Power Station Auxiliary Equipment Works fully displays its comprehensive strength in domestic seawater desalination industry, and further consolidates its leading position in the sector. Also by undertaking this project, Shanghai Electric is practicing its 14th Five-year Plan, taking the initiative to integrate itself into the national environmental protection strategy, and promoting green development. Taking this project as an opportunity, Shanghai Electric will give further play to its industrial advantages, work in a down-to-earth way, and drive its high-quality development.

This project is located at Shandong Yulong Petrochemical Industrial Park in the south of Bohai Bay, by which freshwater will be produced by the seawater desalination plant utilizing the waste heat and electric energy from Yulong refining projects, and be applied as water for refining and chemical production. In this way, the consumption of surface water and groundwater will be reduced. Based on the thermal and membrane hybrid process, this project produces an aggregate of 160,000 tons of water on a daily basis, including 80,000 from membrane desalination and 80,000 tons from thermal desalination.

AHEAD OF THE GAME!

Shanghai Electric's Offshore Wind Capacity Commissioned in 2021 Ranks No.1 in the Word

According to the latest data released by Bloomberg NEF, Shanghai Electric Wind Power Group (the "Shanghai Electric Wind Power") is ranked first among global wind turbine manufacturers in terms of installed offshore wind capacity in 2021.

The rush on the installation of offshore wind turbines caused by the subsidy rollback has led to a 251% increase in China's installed offshore wind capacity, with four Chinese manufacturers occupying the top four spots and Shanghai Electric Wind Power ranking first with 4.1GW of new installations.

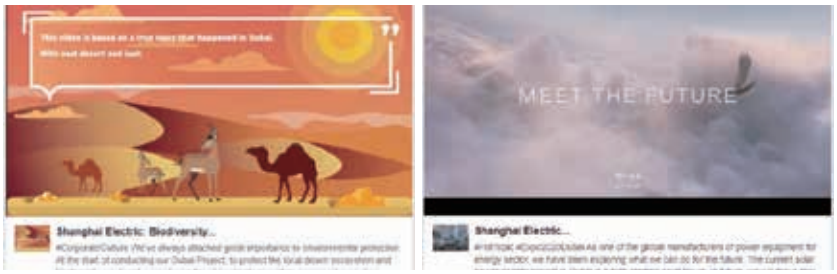
Shanghai Electric Wind Power continues to lead the Chinese and global offshore wind power market, demonstrating its strength as one of China's leading offshore wind power manufacturers. In 2020, Shanghai Electric Wind Power led the Chinese offshore wind power market with 1.26GW of installed capacity, putting it second in the world. In 2021, after riding the wave of offshore installations, Shanghai Electric Wind Power's offshore installations increased by more than three times compared to last year.

From the overall data, the global installed wind power capacity in 2021 was close to 100GW, reaching a record high of 99.2GW, representing the second consecutive year that the global installed capacity approached 100GW. The installed onshore wind capacity is 82.3GW, accounting for 83%, while the installed offshore wind capacity is 16.8GW, an increase of 161% compared to 2020. China remains the world's largest wind power market in 2021, while the U.S. ranks second with 13GW of newly installed capacity. The two countries share together more than two-thirds of the world's new installed capacity.

Shanghai Electric Wind Power continues to lead the Chinese and global offshore wind power market, demonstrating its strength as one of China's leading offshore wind power manufacturers. In 2020, Shanghai Electric Wind Power led the Chinese offshore wind power market with 1.26GW of installed capacity, putting it second in the world. In 2021, after riding the wave of offshore installations, Shanghai Electric Wind Power's offshore installations increased by more than three times compared to last year.

Tell the "Belt and Road Initiative" Stories Well

Shanghai Electric Wins Two Prizes from "SILVER DOVE AWARDS"



Recently, the results of the 16th "Silver Dove Awards" sponsored and organized by the International Communication Office of the CPC Shanghai Municipal Committee were officially announced. After evaluation, a total of 214 works were selected for this year's "Silver Dove Awards", of which 21 works by Shanghai state-owned enterprises were awarded. Two overseas communication cases of Shanghai Electric emerged victorious from hundreds of entries, including Biodiversity: The World of John the Antelope, which won the Best Video Award, and Meet the Future of Dubai World Expo, which won the Outstanding Video Award.

The World of John the Antelope: Shanghai Electric's MG animation The World of John the Antelope portrays the creatures in the eco-story through the perspective of John the Antelope, conveying the group's efforts in protecting environment and creatures through the NE1-700MW CSP+250MW PV Hybrid Project in Dubai, and expressing its brand culture of committing itself to ecological balance and biodiversity, as well as its vision to build a harmonious relationship between human and nature. Through the dissemination of Shanghai Electric's official Facebook account, the video received over 71,000 hits and over 40,000 views, significantly promoting the group's brand philosophy of co-existing with nature to protect the Earth, co-founding a society with the international community, and co-creating the future together with all creators.

Meet the Future: As one of the official partners of the China Pavilion at the Dubai World Expo, Shanghai Electric elaborately produced the thematic video MEET THE FUTURE last year. The video shows an array of imaginative application scenarios in a future city: world-leading solar power projects co-built by Shanghai Electric and overseas companies alongside with green, sustainable, smart and interconnected industries like wind power, hydrogen power, energy storage, green traffic and Industrial Internet, depicting a low-carbon future thanks to "intelligent manufacturing in China". In addition to the Dubai World Expo, Shanghai Electric also promoted the video through Facebook with a focus on countries of the Belt and Road initiative for cultural export, thus further consolidating and expanding the Group's influence in the Middle East and surrounding markets.

According to sources, the "Silver Dove Awards" are presented every two years, aiming to vigorously promote international cultural exchanges, enhance Shanghai's international presence, and encourage international communication by various innovative means such as new media. Relying on IP SHANGHAI, a resource sharing platform for Shanghai's urban image, this selection solicited a wide range of outreach works reflecting Shanghai's urban image and activities for international communication, gaining active support from organizations and enterprises at all levels in Shanghai.

SHANGHAI ELECTRIC

872 Million Yuan! Big Order Amidst the Pandemic

Shanghai Electric Wins Tender for Monitoring System Integration and Installation in Two Rail Transit Projects in Chengdu

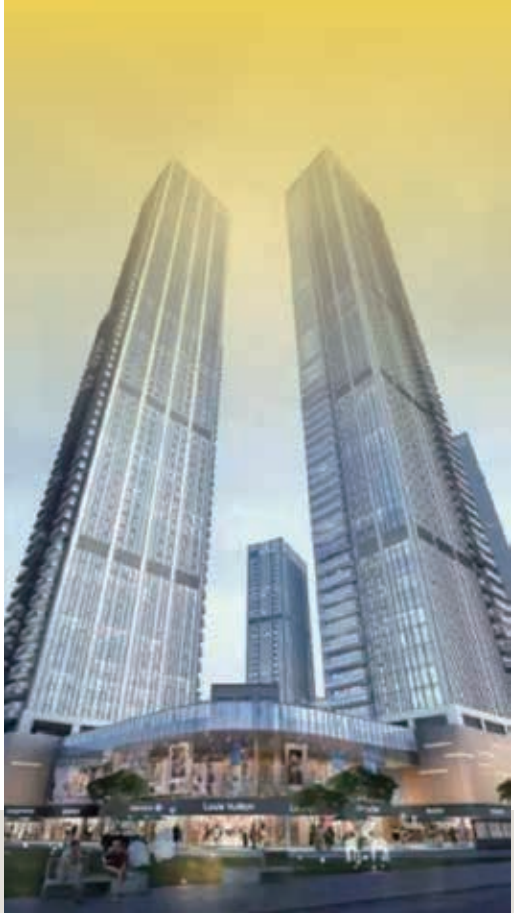
On April 1, Shanghai Electric Automation D&R Institute, a subsidiary of Shanghai Electric Automation Group, successfully won the tender for the integrated monitoring (including communication) system integration and installation project of Line 10 Phase III and Line 13 Phase I of Chengdu Metro, Sichuan Province, as the lead contractor of the consortium, while making every effort to prevent and control the COVID-19 pandemic. The winning bid amounted to 872 million yuan, a record high in the history of the company's bid amount.

While people on both sides of the Huangpu River in Shanghai were fighting against the epidemic, the managers and employees of Shanghai Electric did not stop working with enthusiasm. They ensured that the group's production and operation as well as efforts for pandemic prevention and control went on smoothly and orderly during the lockdown. As the lead company, Shanghai Electric Automation D&R Institute had to join several companies and suppliers to participate in the bidding, which was an extremely heavy workload with complicated coordination and communication. During the bidding period, when both Shanghai and Chengdu were affected by the pandemic, Shanghai Electric Automation Group established a bidding team with experienced technical staff and sent all of them to Chengdu for the project; some members of the team didn't return to Shanghai for one and a half months, ensuring the steady advancement of their work with excellent quality assurance, technical solutions and management ability. They ultimately won the trust of the client and stood out among many integrated monitoring system suppliers. The project includes a comprehensive monitoring system, automatic fire alarm system, environment and equipment monitoring system, access control system, power monitoring system, exclusive communication system, public security communication system, and remote communication system for emergency command and dispatch.

It is the first project of Shanghai Electric Automation Group on the integration of integrated monitoring and communication system for rail transit, as well as its first order in the Chengdu rail transit market, which is of great significance to the development of Shanghai Electric in rail transit automation industry. The project will help drive the better expansion of the rail transit market in southwest China.

In recent years, Chengdu has been vigorously developing rail transit, and has opened 12 lines with a total length of 519 kilometers. The city has planned 36 lines with a total length of 1,666 kilometers for the future.

Shanghai Mitsubishi Elevator Wins New Bid For 49 Elevators and Escalators Installed in Phase III of Changsha Yunda Central Plaza



Shanghai Mitsubishi Elevator expands its business reach while staying committed to ensuring stable operation of Shanghai's elevators amid the city's tough battle against COVID-19, and has been awarded the bid for 49 high-end elevators and escalators used in Phase III of Yunda Central Plaza in Changsha, Hunan Province's capital, making a contribution to foster high-quality life for local people.

Shanghai Mitsubishi Elevator, a manufacturer and service provider for vertical transportation, has been implementing daily maintenance services and emergency plans with utmost effort. As it is working at nearly its full load in terms of the number of elevators it takes care of, Shanghai Mitsubishi Elevator still takes on the responsibility to maintain and timely repair elevators of 11 brands used by 18 hotels for quarantine, closed-loop management and health observation in Huangpu District. What's more, it formulates on-site support plans for self-produced elevators for 8 emergency isolation centers in the districts of Pudong, Minhang, Fengxian, Jinshan, Songjiang, Qingpu, Baoshan and Jiading to the end that in incase of operational failures, immediate services can be provided on-site to solve problems as soon as possible.

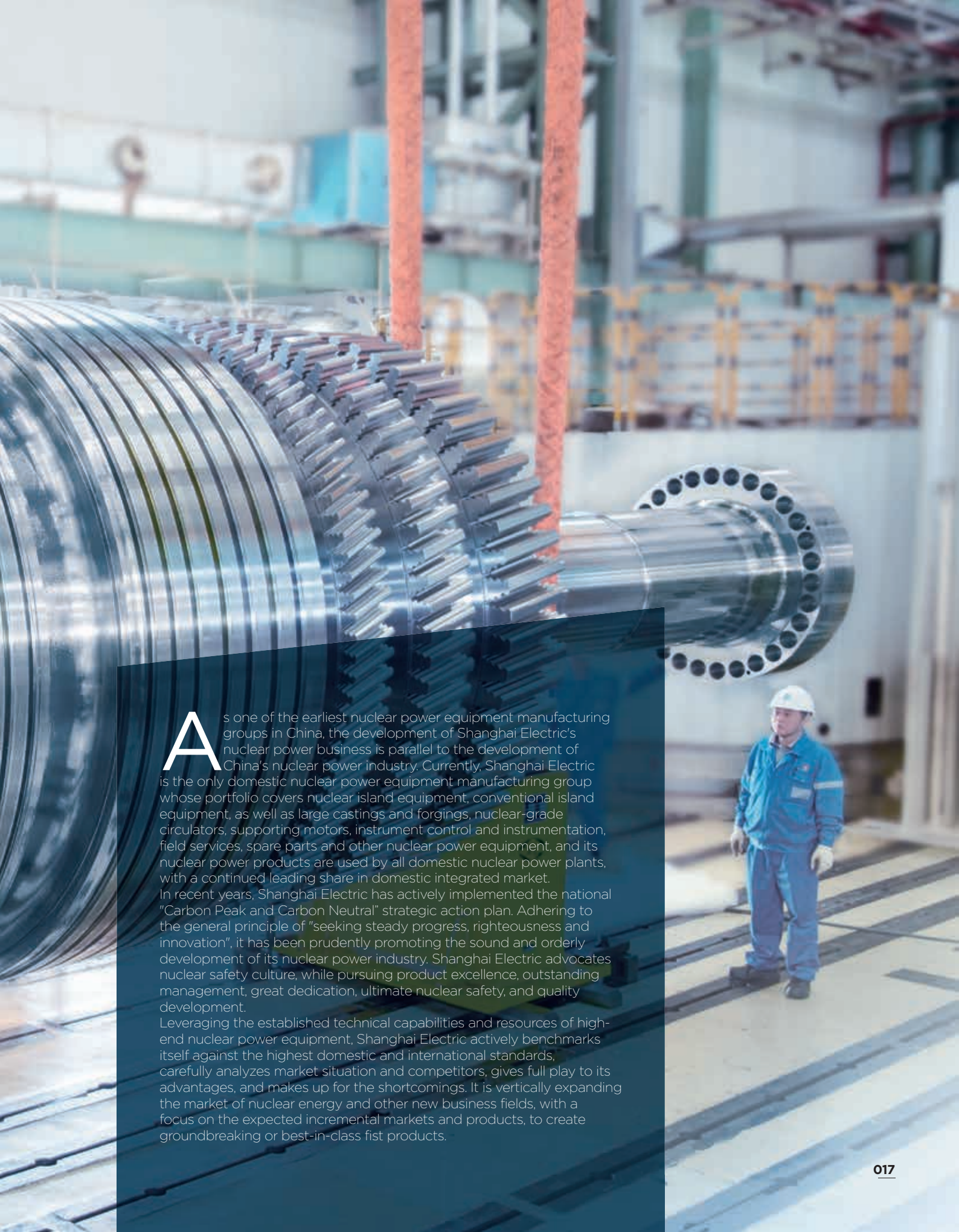
Meanwhile, the sales team of the marketing department keeps working at home despite all kinds of difficulties, backing up the virus containment in lockstep with market share increase and service delivery. Regarding the new commercial project composed of 250-meter-high twin towers, three 150-meter-high buildings and podiums, Shanghai Mitsubishi Elevator will provide 49 elevators and escalators in total including 12 units with a speed of 6m/s, 15 with a speed of 4m/s, 12 for podiums and 10 escalators. It will become a new milestone in urban complex development in Hunan Province and even China. The MAXIEZ-M/H medium and high-speed elevators, a perfect choice for high-end buildings, will be adopted for a number of advantages including less installation space, lower energy consumption, higher operation efficiency and long service life, which is attributed to their leading designs and high-performance traction machines using unique articulated stator core technology.

Since their first collaborative project in 2007, Shanghai Mitsubishi Elevator has offered over 100 elevators to the Yunda Group except for the new units, covering hospitality, accommodation and commercial projects. Putting quality first, Yunda Group again gives the nod to Shanghai Mitsubishi Elevator's high-end elevator solution, both of whom strive to push the development of first-tire urban complexes in China while implementing brand values of high quality and good style.

The Phase III of Yunda Central Plaza developed by Yunda Group is located in the southeast of Changsha with a floor area of about 310,000 square meters, 15 minutes' drive from Changsha Huanghua International Airport, 5 minutes from Changsha South Railway Station providing high-speed train services, and 3 minutes from a station of Changsha-Zhuzhou-Xiangtan Intercity Railway. With 250-meter-high twin towers and three 150-meter-high buildings as new landmarks, the project is designed to be a high-end urban complex and international community where needs for accommodation, recreation and consumption can be easily satisfied.

SHANGHAI ELECTRIC LIGHTS UP THE WORLD

SHANGHAI ELECTRIC'S NUCLEAR POWER BUSINESS EPITOMIZES ITS HIGH-END EQUIPMENT MANUFACTURING



As one of the earliest nuclear power equipment manufacturing groups in China, the development of Shanghai Electric's nuclear power business is parallel to the development of China's nuclear power industry. Currently, Shanghai Electric is the only domestic nuclear power equipment manufacturing group whose portfolio covers nuclear island equipment, conventional island equipment, as well as large castings and forgings, nuclear-grade circulators, supporting motors, instrument control and instrumentation, field services, spare parts and other nuclear power equipment, and its nuclear power products are used by all domestic nuclear power plants, with a continued leading share in domestic integrated market.

In recent years, Shanghai Electric has actively implemented the national "Carbon Peak and Carbon Neutral" strategic action plan. Adhering to the general principle of "seeking steady progress, righteousness and innovation", it has been prudently promoting the sound and orderly development of its nuclear power industry. Shanghai Electric advocates nuclear safety culture, while pursuing product excellence, outstanding management, great dedication, ultimate nuclear safety, and quality development.

Leveraging the established technical capabilities and resources of high-end nuclear power equipment, Shanghai Electric actively benchmarks itself against the highest domestic and international standards, carefully analyzes market situation and competitors, gives full play to its advantages, and makes up for the shortcomings. It is vertically expanding the market of nuclear energy and other new business fields, with a focus on the expected incremental markets and products, to create groundbreaking or best-in-class fist products.

10th

TEN INDUSTRIOUS AND FRUITFUL YEARS!

SHIDAOWAN PROJECT MAKES SHANGHAI ELECTRIC THE NEW CHAMPION

Shanghai Electric was one of the major participants in Shidaowan project, which is a high-temperature gas-cooled reactor demonstration project and responsible for supplying multiple key facilities of the nuclear island and conventional island. After more than a decade of hardwork, Shanghai Electric has independently achieved a number of technological breakthroughs that address global and industrial problems, ensuring that 93.4% of all engineering equipment are made in China.

BUILD THE MOST COMPLETE NUCLEAR POWER INDUSTRY CHAIN IN CHINA

In 1970s, Shanghai Electric entered the nuclear power industry and gradually turned into a new champion of the industry. Now, as the domestic nuclear power equipment manufacturing group leading in history, delivery performance, product support, technology routes, equipment capacity and global cooperation, it has the most concentrated nuclear power equipment manufacturing network in the world, with the 300MW, 600MW and 1000MW grade Gen-II plus and Gen-III pressurized water reactor nuclear power technologies, including Hualong One (HPR1000), Guohe One (CAP1400), AP1000 and CAP1000, EPR and other reactor types, as well as Gen-IV high-temperature gas-cooled reactor, sodium-cooled fast reactor, thorium molten salt reactor, lead fast reactor technologies. Enjoying the largest market share in China, it covers all existing nuclear power technology routes in China, and its nuclear power products are used in all domestic nuclear power plants.

However, the construction of the Shidaowan demonstration project is an unprecedented journey and there is no success story to learn from. The reactor pressure vessel of the demonstration project is about 30 meters high and weighs about 650 tons, which is the largest, heaviest and most difficult to manufacture in the world. It filled the gap of domestic manufacturing

of ultra-large reactor pressure vessel equipment.

It made the largest thin-wall metal internals in the world. The project team from Shanghai Electric remove all technological obstacles one after another, which included forging, drop-weight testing on steel panels, the manufacturing of low-alloy seamless steel pipes and large-diameter metal bellows, making many firsts in China.

When it came to the steam turbine of the conventional island, more complicated issues lay in wait for Shanghai Electric's designers as steam parameters of a Gen-IV reactor outnumbered those of conventional reactors and differed from thermal ones. Regarding Gen-IV high-temperature gas-cooled reactor's special steam parameters and way of operation, Shanghai Electric developed a new type of steam turbine for the nuclear power unit for the first time.

The major helium circulator used in the project is known as the "heart" of the Gen-IV nuclear power high-temperature gas-cooled reactors. The project team has solved many major technical problems, such as the design and manufacture of 3D high-efficiency impeller, adiabatic cooling of bearings inside the shell under a high temperature, large-caliber valves and drive components. What was more, they built a closed testbed with high-temperature and high-pressure resistance to fulfill the pre-delivery test.

Since the start, the project team of Shanghai Electric has valued excellence, and their outstanding technical ability and a great sense of responsibility has led to the creation of a new benchmark for Shanghai Electric nuclear power projects.

PERFECTION IS THE RULE

Persistence, dedication and perfect details are the valuable experience shared by Shanghai Electric's nuclear power technicians.

At the beginning of 2016, the core shell of the metal reactor vessel internal needed the circular ring seam welding. The temperature during the welding needed to be maintained at 250 degrees, and the internal welding workers had to go inside of the cylinder, where they were soaked through in a few minutes. But the room temperature was only about 10 degrees, and the excessive temperature difference made many welders catch a cold.

In the same year, the reactor pressure vessel project also entered the final stage. Fine clamping is the final work before the product leaves the factory, and any defects are to be repaired at this stage. Seal surface repair is an important part. During the welding, reactor sealing surface will be left with welding marks. They are aesthetic issues that also affects material stress and equipment life, and most importantly, a very small bump can cause damage to the seal ring and consequently a terrible nuclear leak.

This technology is extremely demanding - at a distance of 100 mm, the altitude error must not exceed 1 filament (a human hair is 6-8 filaments). To reach each angle, the clampers need to constantly switch between positions or maintain one position for hours. In summer, when mixed with dripping sweat, iron filings can sting like needles. In winter, hand cramping and numbing always happen after long working hours.

The quality inspection of high-temperature gas-cooled reactor equipment is very strict, and from time to time, patch welding is needed, that is, remove the defects such as porosity found in visual dimensional inspection or flaw detection and reweld it. The rewelded parts often form new bumps, which take a lot of time to repair. In doing this kind of elaborate work, technicians of Shanghai Electric would repeatedly polish the welding marks with a small pile until they meet the accuracy requirements.

FROM "NUCLEAR COUNTRY" TO "NUCLEAR POWER"

The greatest difficulty requires the most efforts. Vortex speed limiter is the most difficult part to assembly in the whole project. Each group consists of 12 pieces (6 pairs) of strong permanent magnets, and the rest of the parts almost all have magnetic conductibility. During the assembly, the super strong magnetic conductibility is very likely to cause harm to the permanent magnets themselves, other parts and personal safety, which complicates the assembly. Based on the performance of permanent magnets, the assembly workers made innovation and developed several complete sets of special uniform, which have effectively improved the assembly efficiency and quality, ensured the assembly precision, and received several patents.

Before leaving the factory, the last test for the major helium circulator is the 100-hour stable operation in full speed and full power. The whole commissioning process and the performance test at each speed require a long period of operation at high temperature and pressure, so, 24 hours a day, the project personnel have to take turns to do the commissioning while dealing with all kinds of unexpected situations. After countless difficulties, this important task finally came to a perfect end in 2018.

The key node before grid connection is the nuclear pulse propulsion. As the last “watchers" of the project, the project team often rushed to the site in the middle of the cold night to provide best solution for the owner. Since the steam turbine of the project went into commissioning, the project team and the technical team have been responsive to customer needs and maintained a fast response mechanism. The design service team operated on site in the front and the expert team was on standby 24 hours a day at the backend, so that all problems could be solved on the same day that they were found. On the day the project was connected to the grid, the owner sent a letter in appreciation of the dedication of Shanghai Electric's on-site service personnel and praised the company for watching over Shidaowan nuclear power project.

Ten industrious and fruitful years. The project construction witnessed Shanghai Electric’s devotion, persistence and tenacity. We believe that after the Gen-IV nuclear energy demonstration project, Shanghai Electric's expertise in nuclear power will help China transform from a "nuclear country" to a "nuclear power".

GEN-III PRESSURIZED WATER REACTOR

HUALONG ONE

THE WORLD'S FIRST

FUQING NUCLEAR POWER UNIT

On March 25, 2022, Unit 6 of Fuqing Nuclear Power Plant, the second unit of the Hualong One demonstration project, was qualified for commercial operation. With this, Hualong One demonstration project was fully completed and put into operation.

SHANGHAI ELECTRIC BROKE THROUGH THE FOREIGN NUCLEAR POWER TECHNOLOGY MONOPOLY AND BUILT THE BACKBONE OF HUALONG

On March 15, 2018, Hualong One, the reactor vessel internals of Unit 5 of Fuqing Nuclear Power Plant, manufactured by Shanghai No.1 Machine Tool Works, a subsidiary of Shanghai Electric Nuclear Power Group, has passed the final acceptance, and paving way for Hualong One's progress as the world's first.

On January 29, 2021, Unit 5 of Fuqing Nuclear Power Plant completed 168 hours of full-power continuous operation assessment and became eligible for commercial operation. Unit 5 of Fuqing Nuclear Power Plant is the world's first unit to be put into commercial operation with "Hualong One" Gen-III nuclear power pressurized water reactor technology, marking China's breakthrough of the monopoly of foreign nuclear power technology and official status as a nuclear power.

The reactor vessel internal, known as the "Backbone of Hualong", precisely locates and supports the nuclear fuel assembly, correctly guides the reactor control rods for nuclear reaction start-up, stoppage and power adjustment, and provides correct channels for reactor temperature measurement and neutron flux measurement. It establishes a reasonable water flow channel for the reactor and provides secondary safety support for the reactor in case of accidents.

THE FIRST OVERSEAS REACTOR

KARACHI UNIT

In March 2021, the Pakistani Ministry of Energy announced: The first overseas reactor of the third-generation nuclear-powered" Hualong One" developed by China, the Karachi K2 generator Unit in Pakistan, was successfully connected to the grid.

3

SHANGHAI ELECTRIC'S MAIN NUCLEAR POWER EQUIPMENT FUELS PAKISTAN'S LOW-CARBON DEVELOPMENT

With China Zhongyuan Engineering Corp. of China National Nuclear Corporation as the general contractor, Shanghai Electric served as the major equipment supplier in the construction of Karachi K2 generator unit, providing for the first overseas reactor of "Hualong One" main equipment including reactor vessel internals and steam turbines and other crucial facilities.

Shanghai Electric began to manufacture reactor internals of the K2 unit that is also known as the "Backbone of Hualong" since 2015. The equipment comprises 13,487 components under 236 categories with a height of 11.036 meters, a diameter of up to 4.188 meters and a weight of some 160 tons, adopting the highest standards in the world.

The Pakistan-based K2 unit is estimated to generate some 100 gigawatts on a yearly basis, meeting the production and life demands of 1 million natives. In other words, it equals to cut the consumption of standard coal by 3.12 million tons and CO_2 emission by 8.16 million tons, or plant over 70 million trees.

The project construction also boosts related industries in Pakistan by creating over 10,000 jobs, bringing benefits to local livelihood and economy.

[Highlights]

"Hualong One" uses nuclear power technology for third-generation pressurized water reactor, developed and designed in China, possessing completely independent intellectual property rights, with a design life of 60 years. Based on China's nearly 30 years of mature experience in nuclear power construction and operation, "Hualong One" has drawn on the world's advanced design concepts to achieve a unity of sophistication and maturity, a balance of safety and economy, and a combination of dynamism and stasis, boasting an international competitive advantage.

"Hualong One" has complete independent intellectual property rights, and over 85% of localization rate. Its design technology and software are developed independently. "Hualong One"is a national business card for China's nuclear power going global, and it has become a key industrial brand promoted by China on the international stage. Up to now, "Hualong One" has taken substantial steps in countries like Pakistan, Argentina, and the United Kingdom.

GEN-IV PRESSURIZED WATER REACTOR

NATIONAL HARMONY NO. 1 STEAM GENERATOR

On January 20, 2021, the steam generator of the "National Harmony No. 1" 228 Demonstration Project for the National Science and Technology Major Projects was shipped from Shanghai Electric Nuclear Power Equipment Co., Ltd.

SHANGHAI ELECTRIC LEADS THE WORLD WITH STEAM GENERATOR PRODUCTS

The successful delivery of the Gen-III pressurized water reactor steam generator product with the world's "highest power, heaviest tonnage and largest capacity "indicates that Shanghai Electric has the capacity of manufacturing the world's most sophisticated nuclear power steam generator equipment. It serves as a historical testimony to the "Thirty years" of development of China National Nuclear Power Co., Ltd. Since it began nuclear power generation at Qinshan, through all stages of being a follower, a competitor, and finally a leader.

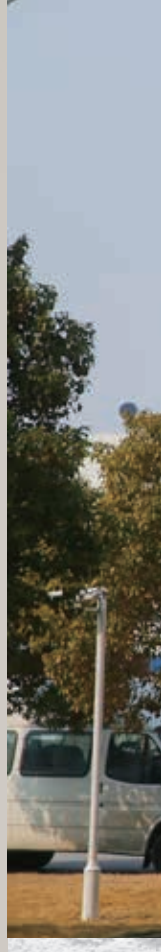
The National Harmony No. 1 steam generator is manufactured by Shanghai Electric Nuclear Power Equipment Co., Ltd., and has undergone the leap-forward development through years of painstaking efforts. The National Harmony No. 1 Demonstration Project is currently the product with the largest power level per unit in the world. It is the Gen-III large-scale advanced static pressurized water reactor unit product in China with complete independent intellectual property rights and export rights. The National Harmony No 1 will definitely upgrade China's nuclear power capacity towards building its own instead of borrowing to connect with the world.

FOURTH GENERATION NUCLEAR POWER HIGH-TEMPERATURE AIR COOLING REACTOR

THE WORLD'S FIRST

SHIDAOWAN DEMONSTRATION PROJECT

On December 20, 2021, a major national science and technology project - the world's first pebble bed modular high temperature air-cooled reactor nuclear power plant with the main features of the fourth-generation nuclear power technology, the Huaneng Shidaowan high temperature air-cooled reactor nuclear power plant demonstration project was successfully connected to the grid for power generation.



SHANGHAI ELECTRIC ACHIEVED BREAKTHROUGHS IN TECHNOLOGICAL BOTTLENECKS FOR SHIDAOWAN NUCLEAR POWER PLANT

The world's first pebble bed modular high-temperature air-cooled reactor nuclear power plant, the demonstration project for Huaneng Shidaowan high temperature air-cooled reactor nuclear power plant, in the construction of which Shanghai Electric participated, was successfully connected to the grid for the first time, on December 20, 2021. This is the world's first fourth-generation high-temperature air-cooled reactor nuclear power project that is connected to the grid for power generation. It signifies that our country has become one of the few countries in the world that have mastered the fourth-generation nuclear power technology, and has become the world's leader in nuclear power technology.

Shidaowan High Temperature Air-cooled Reactor Demonstration Project was listed in 2006 as one of the 16 major national science and technology projects alongside the Lunar Exploration Project and Beidou Navigation, and its construction started in 2012. The Demonstration Project was led by China Huaneng Group, with Shanghai Electric, as one of the important participating units, providing a number of core equipment for nuclear islands and conventional islands. After more than ten years of strenuous efforts, independent exploration and manufacturing, a number of world-class, and industry-specific key technologies have been mastered, which has helped the localization rate of the entire engineering equipment to reach 93.4%.

[Highlights]

Compared with conventional pressurized water reactor nuclear power projects, as an advanced fourth-generation nuclear power reactor technology, the high-temperature air-cooled reactors have the advantages of guaranteed safety, high efficiency, reliable economy and wide applications, which can replace traditional fossil energy sources, and achieve coordinated development of economy and ecological environment.

The Shidaowan high temperature air-cooled reactor, as an example, is the country's first high-temperature air-cooled reactor demonstration power station with independent intellectual property rights, and the world's first fourth-generation nuclear energy and modular commercial scale demonstration power station with higher level of safety. It has the triple characteristics of scientific research, engineering and commercialization.

FOURTH GENERATION NUCLEAR POWER

THORIUM-BASED LAVA REACTORS

RESEARCH AND DEVELOPMENT OF ADVANCED FOURTH-GENERATION THORIUM-BASED LAVA REACTORS

fourth-generation nuclear power generation, and China is the first country in attempt to commercialize it. The reactor uses thorium-232 fission to generate electricity, replacing uranium-235, and the reactor uses a normal atmospheric design. The reserves of thorium in China are much higher than that of uranium. This element is safer and cheaper. The radioactive nuclear waste produced after the reaction is one-thousandth of that of traditional nuclear power plants.

In 2017, Shanghai Electric Nuclear Power Equipment Co., Ltd. undertook and completed the main equipment and circuit system of the thorium-based molten salt simulation reactor. Through technical exploration and independent research on the TMSR-LF0 technology of the thorium-based molten salt scale simulation reactor, it successfully broke through such key technologies as the UNS N10003 alloy material welding and container equipment manufacturing, which has enabled the company to have the manufacturing capacity of solid reactors for the thorium-based molten salt reactor, and further improved the manufacturing technology route of the fourth-generation nuclear-power-reactor-type equipment of Shanghai Nuclear Corporation. The project was delivered to the factory in March 2021, and the on-site installation was completed in October 2021. The completion of this project effectively promoted the construction of the 2MWt liquid fuel thorium-based molten salt experimental reactor and laid the foundation for the TMSR development. D

VIEWPOINTS

INTERVIEWS

PURSUE THE BEST OF YOUTH IN ENGINEERING CONSTRUCTION

ON ZHANG SONG WITH SHANGHAI ELECTRIC POWER GENERATION ENGINEERING, HOLDER OF SHANGHAI MUNICIPAL MAY 1ST LABOR MEDAL

ZHANG SONG

Born in 1985, Zhang Song was recruited by Shanghai Electric Power Generation Engineering Co., Ltd. (hereinafter referred to as "Shanghai Electric Power Generation Engineering") in 2011 after he graduated from Harbin Engineering University with a Master of Engineering degree. From then on, he has devoted most of his time to projects at home and abroad including Sylhet-based and Khulna-based projects in Bangladesh, the expansion of the Sylhet-based one, the Yizheng project in Jiangsu Province, and the Hanas project in Ningxia Hui Autonomous Region, and developed into a capable project manager from a professional step by step. He has been awarded a number of honors, such as the Shanghai Electric "Worker with Li Bin Spirit" title and the Shanghai Municipal May 1st Labor Medal.

With 7 years out of 10 years at Shanghai Electric spent on project sites, we wonder what belief pushes him to work on the frontline that has had harsh working conditions unwaveringly for years. What are the stories lingering in his mind along the whole journey? Zhang Song, a man who is nearly 1.9 meters tall, was overwhelmed by my questions the moment we met.

THE STORY BEGINS WITH HIS COLLEGE YEARS. WHEN A PROFESSIONAL FINDS HIS ARENA.

Magnificent temple, majestic mountains, and winding brooks. The majestic Mount Tai is cloaked in forests with clouds shrouding the top like purely white scarves. Zhang Song's home sits at the mountain bottom which is surrounded by aroma and blossoms in spring as well as different shades of green, fruits and vegetables in summer. There is a deep well with a hand pump in the house yard because areas skirting Mount Tai have abundant underground water. On sunny days, his mother would sit by the well, washing clothes and vegetables, fully occupied by housework. Before dwelling in Tai'an City where Mount Tai locates, his father lived in Harbin City. Zhang Song had lived at Tai'an since he was born. Carrying his father's sweet memories of Harbin and his own hope and passion for the future, he went to Harbin Engineering University after graduating from high school.

Back in 2004, there were only 7 colleges and universities in China that had a major in gas turbines with only about 400 graduates every year. At that time, gas turbines were not widely adopted in the world, and hence many high school graduates had no idea of them. "I want to study 'the advanced', like the gas turbine. " His story with the gas turbine began with his application for the institute after serious consideration.

In 2011, he graduated with a master's degree and was determined to find a job in a company doing gas turbine businesses to truly apply all the know-how he had learnt in the past 7 years. After joining Shanghai Electric Power Generation Engineering, he volunteered to take part in the project team for Phase I of the Sylhet-based power station in Bangladesh without any hesitation. It was when the 12th "Five-Year Plan" was being implemented, and he felt extremely excited that he could make a difference with what he had learnt in the backdrop of clean energy development being advocated across China. However, the tough working conditions of the Bangladeshi project were the least thing he could ever expect.

WIN PUBLIC PRAISE FOR SHANGHAI ELECTRIC THROUGH HARD WORK IN BANGLADESH

As ambitious as he was, Zhang Song was a green hand. Upon his arrival, the project team for the Sylhet-based power plant asked him to deal with electrical, maintenance and heat control tasks under the guidance of senior technicians who instructed him on everything they knew. After some time, he was able to handle small-scale systems. Amid system commissioning, he was chosen to follow the whole process of heat control system commissioning, which by large enhanced his expertise and capabilities of communication and coordination. So, as for the Hanas project in Ningxia, he was responsible for the technology part involving different disciplines and areas all by himself for a long time, also laying a solid foundation for him to be a project manager later. Many

years later, he set his feet on the land of Bangladesh to fulfill the Khulna-based project and the expansion of the Sylhet power plant as a much more experienced manager who knew everything about how a project is executed. He was named Deputy Chief Engineer for the plant expansion project in Sylhet, facing more challenges. Although he was not well prepared for the new role, he managed to lead the team to perform their responsibilities, ascending to an all-round manager from a technical professional.

Looking back on his past years, Zhang Song gratefully said, "It is my team that makes me who I am today, and our team cannot be there without Shanghai Electric Power Generation Engineering." The project team in Bangladesh overcame every obstacle with concerted efforts. Zhang Song knows his team members like the palm of his hand: Project manager Guo Yongjie is highly easy-going and experienced; project manager Shang Yonghui always leads by example in completing all tasks together with his team; site manager Wang Keming handles both the major and the meticulous on-site issues in a well-arranged way; Chen Jiyou is resolute and highly efficient; Shen Feng is enormously responsible and diligent, and Ke Lihong ensures logistical services through her devotion. Quality manager Zhu Hao is also worth mentioning who has worked in Bangladesh for over a decade, contributing to a couple of big projects including Phase I of the Sylhet power plant, the Khulna-based project, and the extension of the combined cycle power plants in Sylhet, and Rupsha project. Oriented at the same goal, everyone commissioned in Bangladesh has strived to tackle all difficulties in a joint manner as if they were soldiers in the same trench. With such a strong and competent team deployed in Bangladesh who has deeply explored the local gas turbine market for over a decade, Shanghai Electric has ensured stable power generation for the Bangladeshi people, created infinite opportunities for the country's development, and enhanced the influence of Shanghai Electric in the overseas market.

ZHANG SONG

TAKE THE LEAD IN FINISHING OVERSEAS PROJECTS AGAINST COVID-19

In June 2020, Chinese factories began to resume production and operation as the virus was put under control while other countries were under fiercer attack of the pandemic with the number of confirmed cases soaring at an exponential rate. Zhang Song was fortunate enough to fly back to take a rest in that period when the number of international flights dropped dramatically, but the expansion project at Sylhet was far from coming to an end. The project team couldn't obtain the temporary handover certificate if the project didn't pass performance tests in time, which would lead to the impossibility of setting the guarantee period and full exposure to risks. Due to the spread of the virus, it was much more difficult to acquire an invitation letter and apply for a Bangladesh visa, which would also take a long time. Only Zhang Song and another employer had effective visas at that moment.

Therefore, Zhang Song resolutely headed towards the site in Bangladesh. Sitting in the empty terminal building, he felt scared when seeing only a dozen passengers there for international flights, but whatever happened, an engineer would never retrieve from his pursuit for his life career. Having arrived at the site, he immediately pressed ahead with the project in all respects: communicating with related parties many times after carefully examining the test schedule, and formulating strict rules to contain the virus. In this way, he helped to protect all staff on site from infection.

September was the most

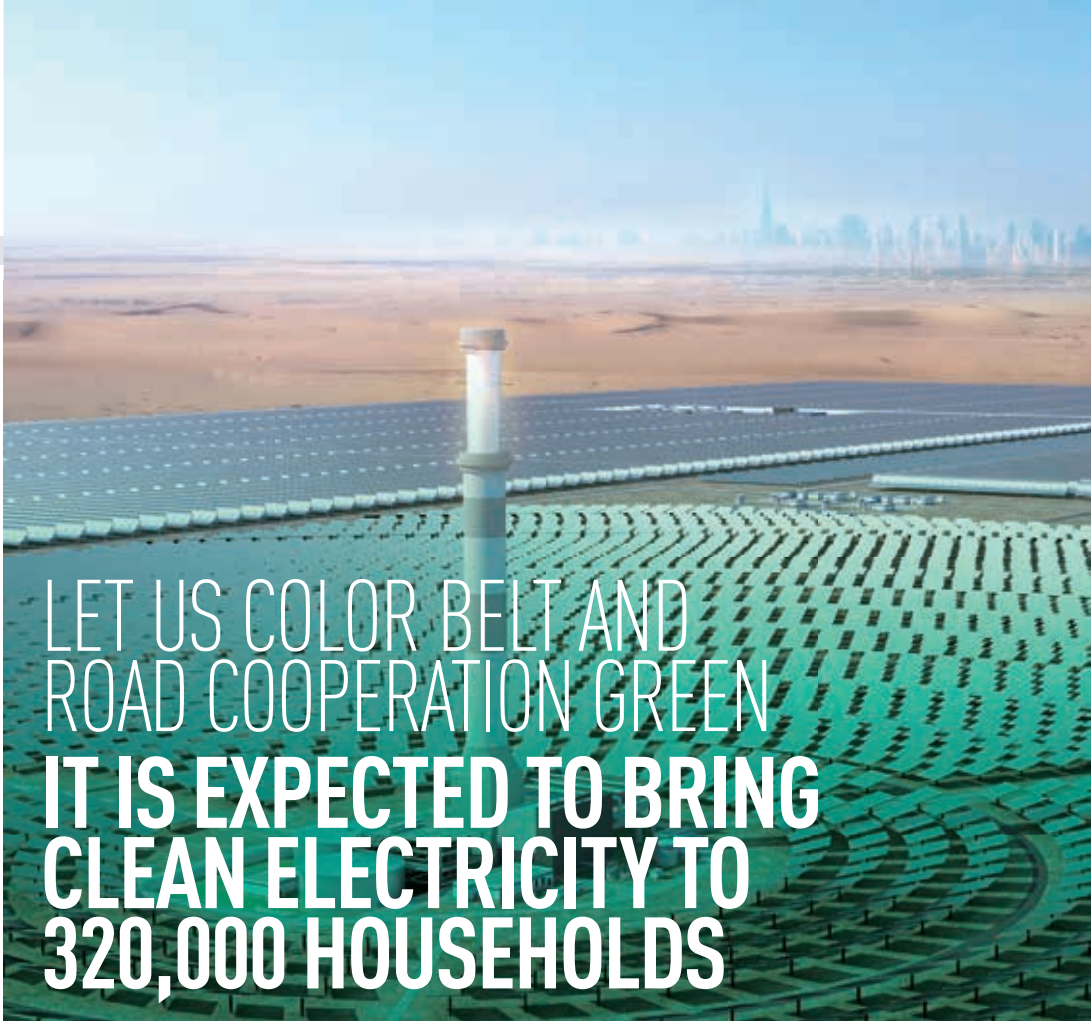
critical month for the expansion project to prepare for the performance test. Companies responsible for the test were unable to send their professional personnel to the site due to the pandemic, leaving Zhang Song and his team no choice but to perform the test personally with staff responsible for the guarantee period under the remote guidance from these companies. The unit ran into a string of problems because it hadn't worked for a long time, severely harming the team's confidence. What was worse, the performance test had to be postponed after the date was set because new problems occurred. With the final test date determined, the team passed the pre-test as expected, and it appeared that everything was ready. However, when the project owner and members of the committee gathered at the site on the next day, hoping to see a successful test, the data collector reported an error all of a sudden, putting the test on the verge of being delayed again. Zhang Song arranged for technicians to solve the problem as soon as possible immediately. In the end, they passed the test as scheduled in a coordinated way.

In Shang Yonghui's opinion, Zhang Song is a humble man of responsibility and diligence. As for pressing installation and commissioning tasks, he always sticks to the frontline of removing technical difficulties; as for bottleneck problems, he always digs into technical data provided by manufacturers for hours at night, trying to figure them out; as for the team, he gets along well with younger colleagues and often exchanges ideas and experience on technical issues and related control measures, nurturing the development of Shanghai Electric.

STAY TRUE TO HIS ORIGINAL ASPIRATION AND GRATEFUL TO SHANGHAI ELECTRIC

"Young people are expected to love what they do. In a society filled with various allures, we shall have a clear idea of what we really want to achieve and approach our goals unyieldingly. In addition, we shall never forget the support of Shanghai Electric who boosts our own development by creating platforms and opportunities. Tasks bring us to grow, and these intangible assets are the most invaluable and cannot be translated in terms of money. For me, what I get is just what I aspire to. I don't care that my salary is lower than others', I have more business trips or my home is far from my office. At Shanghai Electric, I can utilize my knowledge and skills towards the same goal shared with my teammates and see personal development day by day. Why would I leave such a warm and encouraging family? " said Zhang Song.

In an era where everything is changing at a fast pace, Zhang Song hopes that the young can stay true to their goals and work in a pragmatic way with a long-term vision. Much more than a position, work means a career worth fighting. Don't worry that you might be unrecognized. With Shanghai Electric's excellent platform, your talent will find its way and blaze a bright trail. Small as our strength is, we can still trigger love and light.



LET US COLOR BELT AND ROAD COOPERATION GREEN

IT IS EXPECTED TO BRING CLEAN ELECTRICITY TO 320,000 HOUSEHOLDS

Editor's note: On January 11, the People's Daily published a feature titled "China Propels Joint Construction of Green Silk Road with Active Efforts", focusing on the green projects that China and countries along the Silk Road have jointly created within the framework of the Belt and Road Initiative (BRI) to benefit the present and future generations. The feature opens with a report on a 700-megawatt concentrated solar power (CSP) and 250-megawatt photovoltaic (PV) solar power project in Dubai with Shanghai Electric as the EPC contractor under the title It is Expected to Bring Clean Electricity to 320,000 Households.

A phalanx of heat mirrors and solar panels built by workers from China and other countries are expanding around the 262-meter solar power tower which stands out at the Mohammed bin Rashid Al Maktoum in Dubai, United Arab Emirates, in the scorching sun.

The solar park is located in the heart of the desert, about 65 kilometers south of downtown Dubai. It is home to Dubai's 700 MW CSP and 250 MW PV project, the fourth phase of construction at the solar park. Covering 44 square kilometers, the equivalent of more than 6,000 football fields, it is a concentrated solar power project with the largest installed capacity, investment scale and heat storage of molten salt tanks in the world. Currently at the peak of construction and installation, the project sees more than 9,000 Chinese and foreign employees working simultaneously on it at most.

Standing in front of the sand table, Zhao Hui, the general manager of the project, explained how the power station uses solar heat to generate electricity. 70,000 heat mirrors installed in the CT and PT photo-thermal devices reflect and concentrate large areas of sunlight into a solar energy collecting device. Heated by solar energy, molten salt in the collecting device melts into liquid, which is flowed to and stored in high-temperature molten salt tanks. When electricity is needed, the molten salt in tanks heats water to produce steam with which to drive a generator. Unlike common PV power stations, which only work when there is plenty of sunlight, this

project boasts the ability to store a large amount of heat generated in the sun and provide stable electricity at night or on cloudy days, so that solar energy can be converted into electricity continuously and steadily for 24 hours.

"Recently, some units of the project have been connected to the grid and started to transmit electricity to various parts of Dubai," said Zhao Hui. The UAE government has set its goal of diversifying energy sources and reducing the use of fossil fuels in its "Vision 2021". The "Energy Strategy 2050" further calls for increasing the share of clean energy in the UAE's energy mix from the current 25% to 50% by 2050 and reducing carbon emissions from power generation by 70%. "When fully operational, the project will help the UAE achieve this goal by connecting 320,000 homes to clean electricity and reducing carbon emissions by 1.6 million tons per year. "

"I remember when the project started, and we were standing here, the desert was as far as the eye could see. Now we are both pleased and proud to see the initial completion of large-scale and orderly power generation facilities." Fasol is the construction manager of the CT photothermal power generation project with 15 years of experience in this field. He said, "During the years of participating in the project construction as part of a Chinese company, I have felt the friendliness and professionalism of my Chinese colleagues. The Chinese team is experienced and responsible, and we have made continuous progress by learning from each other." Fasol added that in the process of jointly building the Belt and Road, Chinese companies have been practicing the concept of environmental protection and minimizing the impact of the project on the local ecological environment. Happily, the surrounding environment keeps improving as the project continues to progress.

Patches of green appear in the yellow sand beneath the solar panels, struggling to grow. They are what the employees call the "green romance" of the desert. It turns out that the leveling of the land and the installation of devices play a role in sand stabilization, which has not only helped reduce sandstorms around it, but created conditions for the growth of vegetation. Meanwhile, the reflection of the heat mirrors reduces solar radiation under them, and water seeps into the sand when the mirrors are being cleaned, eventually allowing grass to grow in the desert.

"Lizards, camels, antelopes, red foxes...These local wild animals didn't leave because of the super project." The employees of Shanghai Electric kept ecological protection in mind during the construction of the project, according to Mohammed Benkhadem, Health, safety and environment manager of the project. Professional animal conservation organizations in Dubai were hired by the project department in the early stage of construction to inspect the site and monitor the movement of wild animals in the area. In accordance with local practices, an opening was set up every 200 meters in the fence with food and water placed nearby to attract wildlife remaining on the site, and eventually move them safely outside the area. "We became half zoologists, spending every spare moment with conservationists studying the habits of these wild animals. "

In addition to wild animals, there were more than 200 trees on the site. The project team worked hard to find ways to protect these precious trees, which had been growing in the desert for many years, and ensure that each tree could be safely transplanted. It is said that the project team hired a professional agency to locate and number the trees one by one with GPS before officially moving them, and then watered them for 10 consecutive days. A special road was even built in the desert to facilitate vehicle transportation. "Chinese companies have indeed set an excellent example in protecting the environment and improving people's livelihood." Fasol said, impressed. D

LOOK AT THE STARS WHILE KEEPING YOUR FEET ON THE GROUND

During the Spring Festival, I visited the nature museum. Because it was a holiday, the museum was crowded and the vast majority of the visitors were children. Before that, I also visited the Planetarium. Despite the distance, these places are well worth a visit. To quote a popular saying: without visiting museums, life is incomplete.

In the museum, you can temporarily forget about earthly trifles and instantly become a philosopher, reflecting: Who am I? Where did I come from? Where am I going? The origin and evolution of species as well as the specimens and fossils are mesmerizing. In the planetarium, the exhibitions under the themes of "space-time", "gravity", "light", "elements", and "life" are really impressive and thought-provoking.

I remember learning math as a child. "One, ten, a hundred, a thousand, ten thousand, a hundred thousand, a million, ten million, a hundred million..." I basically stopped there. But there are more Chinese quantity units: Zhao (1012), Jing (1016), Gai (1020), Zi (1024), Rang (1028), Gou (1030), Jian (1036), Zheng (1040), Zai (1044) ... The numbers are boundless. The universe is full of mystery and the endless unknowns are waiting to be explored.

Let's go back to the present moment: in the blossoming season, we are enjoying the sunshine, the company of family and friends, the scenery, the delicious food, and all life's beauties. But if we think about it, in the vastness of time and space, the most beautiful things are transient. Insignificant and weak, each one of us is just a drop in the ocean. As a result, from ancient times to the present, people have always searched for meaning in life.

Some would say we are busy making a living each day and have no time and energy to think about these profound questions. It's true that on this planet, many people can barely make ends meet and everything else is a luxury for them. But the spirit of exploration is the reason why humans are the masters of the planet. We have gone to space and have been dreaming of migrating to other planets. It is certain that exploration will continue as long as humans exist.

Common people like us cannot directly participate in scientific exploration, but we should open our minds and enrich our spiritual life, especially in the unusual times when all people are all fighting against the pandemic. During the lockdown when we are working from home, we should learn to slow our pace down to read more and look up at the sky more often. The earth under your feet is already 4.6 billion years old. And you are a lucky generation who hasn't experienced war in your lifetime. It's just a battle with a virus that we are certain to win, and it's just a matter of time.

Look at the stars and keep your feet on the ground. This is the most graceful gesture. During the pandemic, our operation and maintenance services are uninterrupted and we work efficiently from home. Shanghai Electric's digital technology plays a powerful role and demonstrates our "intelligent" service. For the engineering site, a drone shows the completed power plant in blue and white in Pancevo, Serbia as a "new landmark" at the bank of the Danube. For the test site, another heavyweight blade developed by Shanghai Electric Wind Power Group successfully passed the test, accelerating the arrival of the parity era for China's blades ...

Embrace good times and bad times with a broad mind, and strive to complete the mission to live a regretless life. It's a source of happiness and pride to write a splendid chapter in human history.

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