



2018

CORPORATE SOCIAL RESPONSIBILITY REPORT

株洲中车时代电气股份有限公司

ZHUZHOU CRRC TIMES ELECTRIC CO., LTD.

(A joint stock company incorporated in the People's Republic of China with limited liability)

Stock Code: 3898



NOTES

For better expression and reading, Zhuzhou CRRC Times Electric Co., Ltd. is represented as “CRRC Times Electric”, “the Company” or “we” in this report.

The report is prepared with references to the Environmental, Social and Governance Reporting Guide set out in Appendix 27 to the Rules Governing the Listing of Securities on The Stock Exchange of Hong Kong Limited, Guideline on Sustainable Development Report of the Global Reporting Initiative (GRI), Guideline on Social Responsibilities of Industries (GSRI-China) and “the Ten Principles” of the UN Global Compact, and based on the actual situation of CRRC Times Electric.

Unless otherwise specified, the report covers the period from 1 January 2018 to 31 December 2018. The currency used herein is RMB. This report covers the Company’s headquarters and share-holding subsidiaries but not including joint stock companies, and uses the same scope, boundary and calculation methods as the previous reports.

This report is a faithful reflection of the Company’s active fulfillment of its economic, environmental and social responsibilities and its full implementation of the sustainable development strategy. It is a report of full disclosure of the Company’s management performance related to stakeholders’ concerns and expectations. All the information and data herein are collected from the Company’s official documents, statistical reports and sustainable development practices of functional departments and subordinate units.

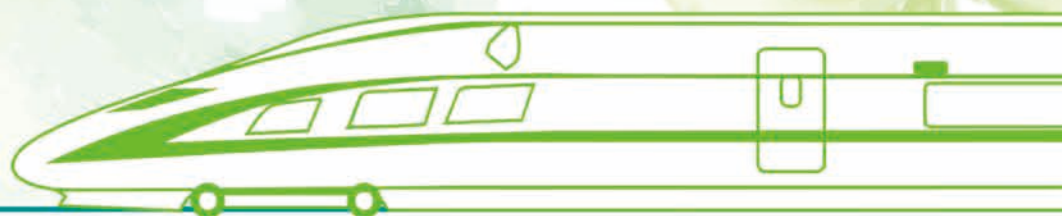
This report is published in both Chinese and English versions. If there are discrepancies between the two versions, the Chinese version shall prevail.

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SPEECH BY THE GENERAL MANAGER



During the year of 2018, the international macro environment experienced profound changes, and China's economy operated steadily with favorable momentum in opportunities and challenges. China continued to implement the "Belt and Road Initiative" and opened up to the outside world, explored the pilot reform of "administrative streamlining, power delegation, regulation improvement and service optimization" and "Double Hundred Actions", which created new operation environment. During the year, the construction of national key infrastructures and major equipment projects such as rail transit remained to be an important driver of economic growth. By leveraging on the platform of CRRC, CRRC Times Electric fully utilizes the brand advantage of CRRC, upholds the fine culture of CRRC. Adhering to the mission of "connecting the world to benefit human", we strive to become the "preferred supplier of complete solution for transport and energy electrical system in the world".

Through forty years of reform and opening up, the Party and China overcame many obstacles and made great achievements. Reform and opening up will continue, and from enterprises, organizations to individuals, the whole country is making concerted efforts in continuously deepening the reform and innovation through unwavering exploration and practices. Looking back at the path we walked through, the Company carried out numerous exploration and practices in its development and accumulated unique advantages which are important support for continuous growth. The industry sectors of the Company have huge development potential as they are all in line with the national strategies of "Belt and Road Initiative", high-end equipment development and building China into a strong marine power. The "Eight Vertical and Eight Horizontal" network, "Road Haulage to Rail-Freight Transport", state-owned enterprises reform and other relevant policies provide more opportunities for industry expansion. Facing opportunities and challenges, the Company is confident that it is able to deliver great results in the new era. The Company actively implemented the management requirements of the Board, captured the development opportunities in this era, set clear objectives and emancipated its mind to carry out reform and innovation. It also consolidated its position in core industry, made breakthrough in five major growing industries and the international market, put efforts in innovation of system, mechanism and technology quality as well as strengthening refined management and organizational protection, developed an efficient system for organizational management and control and resource protection and made concerted efforts to step forward into a new era.

With a heart of gratitude, the Company is always on the mission to create and share value. The Company will stay committed to sustainable development and actively fulfil its role as a responsible corporate citizen. It will strive to maintain the balance among industrial development, environmental protection as well as social and business progress, thereby benefiting all stakeholders by sharing the fruits of corporate growth with the country, society, shareholders, customers and employees.



SPEECH BY THE GENERAL MANAGER



In light of the PRC's macro political and economic backdrop, the Company will hold on to its mission and responsibilities on development, while focusing on four major core concepts, namely "integrity and diligence, quality-driven, value creation and business achievement". At the same time, it will pass on and promote its traditions and legacy to shape shared values. It will also standardize the governance structure for legal persons and maintain harmonious investor relationship. With focused efforts in business development as well as system standardization, the Company ensures honest, prudent and trustworthy operations.

The Company's commitment to and engagement in social responsibilities are demonstrated in all aspects, including standardized enterprise governance, cooperation with customers and suppliers, and prevention of operational risks. By setting up a complete energy management system, the Company has endeavored to cut energy consumption and emission, with the aims of improving the environment and combating climate change. Through design and manufacture of energy-saving products, the Company boosts energy efficiency and mitigates the adverse impact on the climate and environment. Moreover, the Company promotes the upgrade of industry technology and know-how, and supports local economic development with technological innovation, so as to provide the safest, most comfortable and convenient green transport modes for society.

The Company fulfils its social responsibilities and regularly organizes community activities to interact with stakeholders. Besides, it actively participates in social and public welfare events. The Company enhances the research and development of semiconductor and conversion technology through collaboration with local and overseas renowned universities. In addition, it pays attention to the occupational health and safety of staff and arranges regular physical check-ups for them. All these initiatives showcase the values of CRRC Times Electric in its pursuit of honest operation and highly efficient development.

Honest operations are crucial to corporate development. CRRC Times Electric always upholds the operating philosophy of integrity and diligence, while enhancing corporate brand and market position with high quality products. Aiming at mutual benefits and sharing, the Company strives to explore new growth momentum in various areas along the industrial chain, and works towards value creation and enhancement by capitalizing on all types of resources. I believe that with our relentless efforts, we will be able to deliver reasonable returns to our shareholders, provide quality products and services to customers, seek more happiness for our staff and create greater value that brings industrial progress and social development.

Executive Director and General Manager of Zhuzhou CRRC Times Electric Co., Ltd.
Liu Ke'an



PART I COMPANY PROFILE AND GOVERNANCE

I. COMPANY PROFILE

1. Introduction

Zhuzhou CRRC Times Electric Co., Ltd. (formerly known as Zhuzhou CSR Times Electric Co., Ltd.) was established jointly by five units on 26 September 2005, including CRRC Zhuzhou Institute Co., Ltd. (formerly known as CSR Zhuzhou Electric Locomotive Research Institute Co., Ltd.). On 20 December 2006, it was successfully listed on the Stock Exchange of Hong Kong Limited (stock code: 03898 HK).

In order to achieve “higher reliability and safety, as well as higher efficiency and effectiveness”, CRRC Times Electric adopts the rapid traction management model and adheres to the “concentric diversification” development strategy. Through continuous innovation, it possesses ten core technologies and expands to advantageous sectors. Focusing on technology and market, it has established a complete industrial chain comprising “basic parts + devices and systems + overall units and engineering” for various sectors, including high-speed rail, locomotives, urban rail transit, railway engineering machinery, signal and communication, high power semiconductor, sensor, marine engineering equipment, new energy vehicle, environmental protection and general inverter, with the global presence in various countries and regions.

With the purpose of “connecting the world to benefit human”, CRRC Times Electric aspires to work with the community, in order to make outstanding contributions to the growth of China’s high-end equipment industry.

PART I COMPANY PROFILE AND GOVERNANCE



2. The Main Economic Performance of the Company in 2018

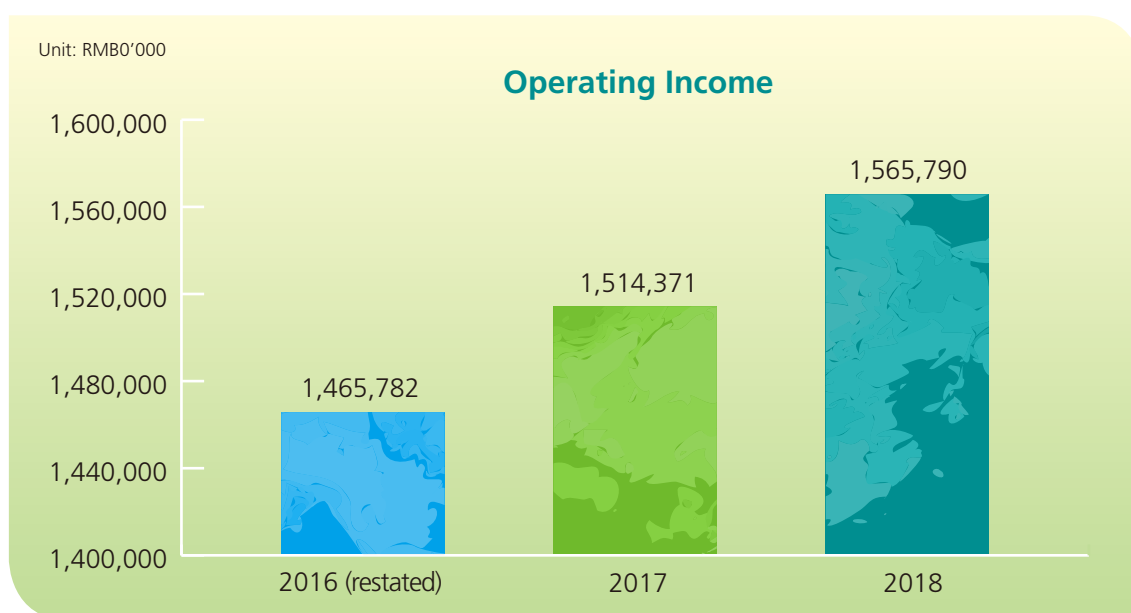
The Company's main business performance indicators saw improvement in 2018. Set out below are the business performance indicators:

Table of major business performance indicators

Unit: RMB ten thousand

Indicator	2016 (restated)	2017	2018
Operating income	1,465,782	1,514,371	1,565,790
Total assets	2,373,528	2,664,965	2,903,452
Total profits	332,025	287,431	296,713
Total tax payment	150,921	153,365	116,892
Operating costs	906,228	952,904	979,025
Market value of the Company's share capital	4,137,510	4,996,424	4,469,994
Revenue distribution	52,896	52,896	52,896

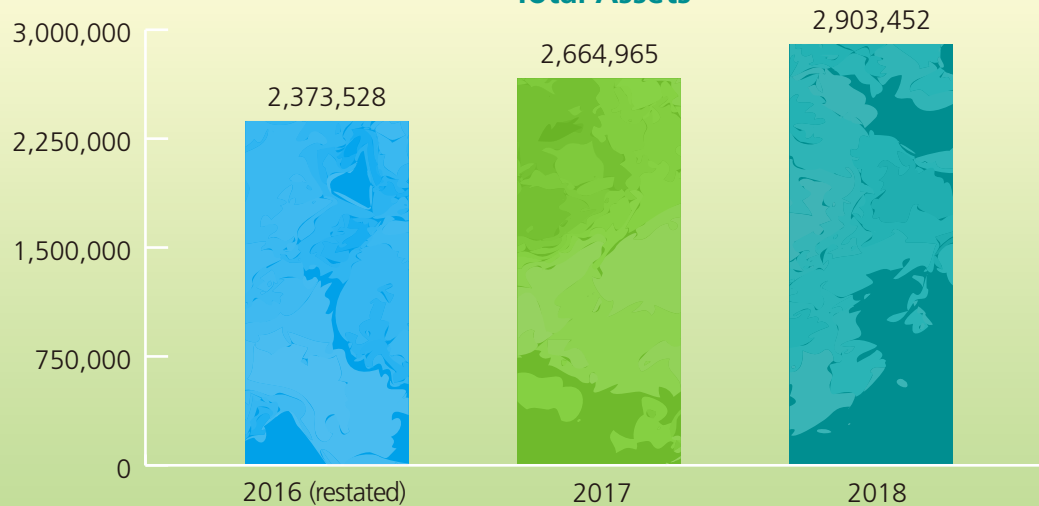
* Note: The revenue distribution in 2018 shall be subject to the approval of the general meeting of shareholders.



PART I COMPANY PROFILE AND GOVERNANCE

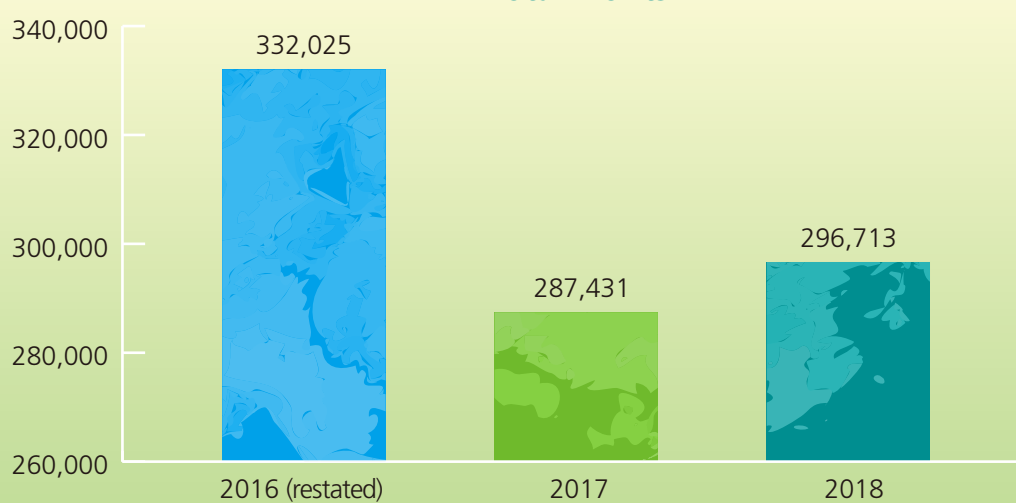
Unit: RMB0'000

Total Assets

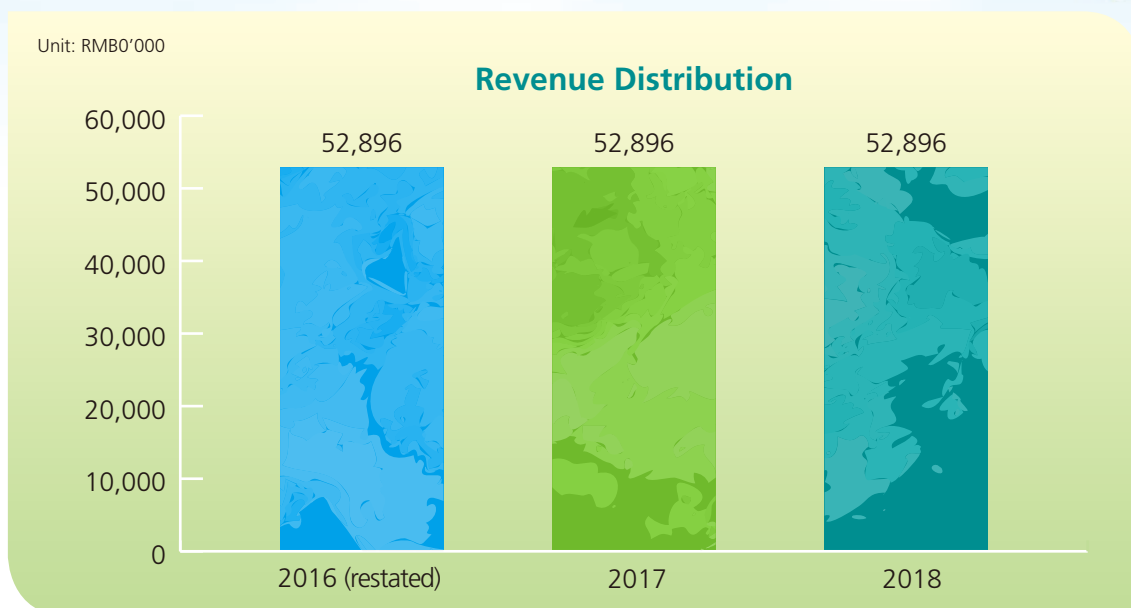


Unit: RMB0'000

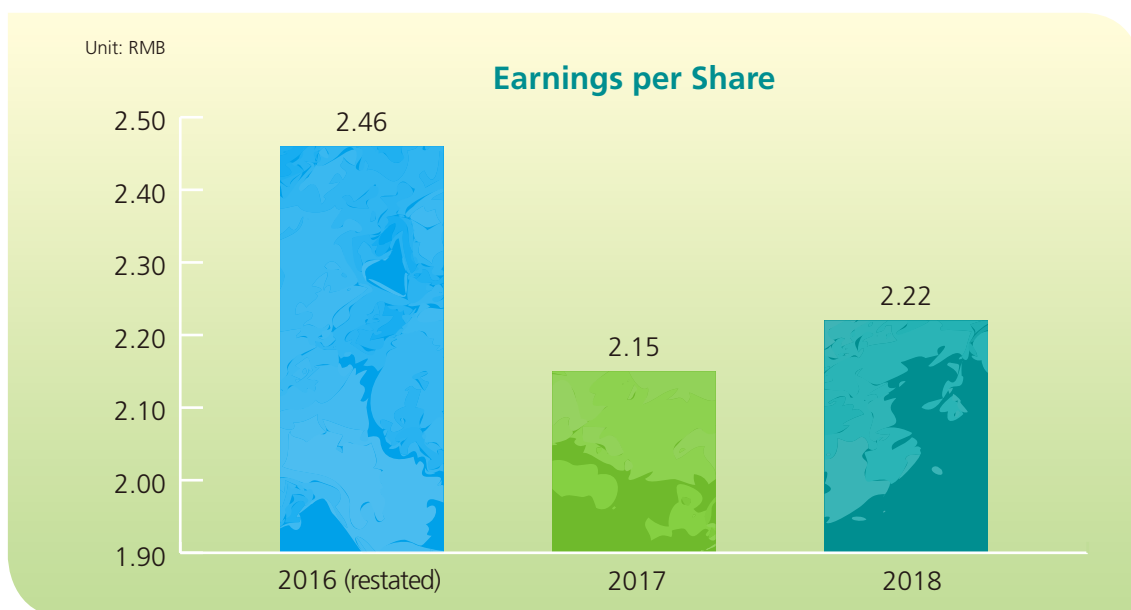
Total Profits



PART I COMPANY PROFILE AND GOVERNANCE



The earnings per share of the Company declined slightly in the past three years. From 2016 to 2018, it recorded earnings per share of RMB2.46, RMB2.15 and RMB2.22, respectively.



– Business performance of sub-product

In 2018, the Company achieved an operating income of RMB15.658 billion, including RMB2.397 billion from traction converters, auxiliary power supply equipment and control systems for locomotive products, RMB3.715 billion from traction converters, auxiliary power supply equipment and control systems for EMU products, RMB3.150 billion from traction converters, auxiliary power supply equipment and control systems for urban transit products, and RMB6.396 billion from other products.

PART I COMPANY PROFILE AND GOVERNANCE

Operating income from major products in the past three years is as follows:

(Unit: RMB million)

Indicators	2016 (restated)	2017	2018
Traction converters, auxiliary power supply equipment and control systems for locomotive products	1,925	2,692	2,397
Traction converters, auxiliary power supply equipment and control systems for EMU products	5,446	3,438	3,715
Traction converters, auxiliary power supply equipment and control systems for urban transit products	2,584	2,579	3,150
Railway maintenance machineries related products	1,782	3041	3,177
Signal & communication products	536	653	789
Key electric part system and component products	1,562	1764	1,691
Marine engineering products and others	823	977	739
Total operating income	14,658	15,144	15,658

- Significant financial support from the government

From 2016 to 2018, the Company has undertaken various major scientific and technological projects of the state, the ministries and commissions and Hunan Province. Total allocation from the government for scientific and technological projects amounted to RMB54.67 million (restated), RMB58.07 million and RMB123.13 million in 2016, 2017 and 2018 respectively.

- Employees' total remuneration and classification

In 2018, the total remuneration of our employees was RMB1,991.49 million, including wages of RMB1,395.63 million, wage surcharges of RMB530.64 million and welfare expenses of RMB65.22 million.

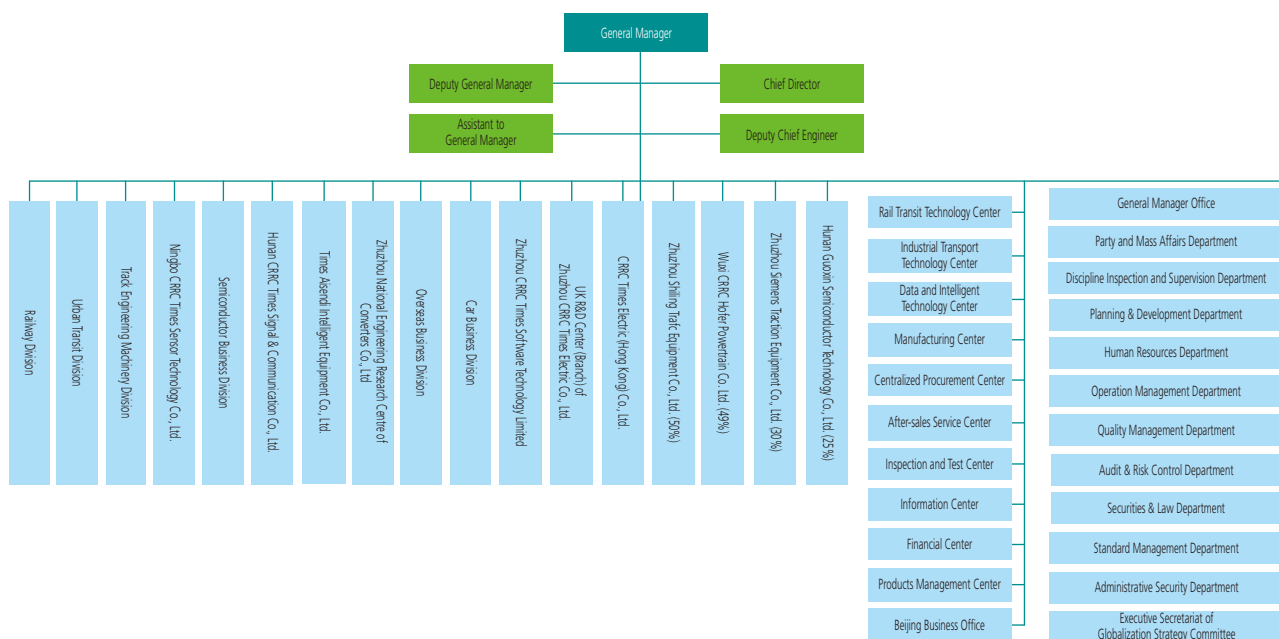
PART I COMPANY PROFILE AND GOVERNANCE

II. CORPORATE GOVERNANCE

1. Corporate Governance Mechanism

1.1 Corporate Organizational Structure

Organizational chart of Zhuzhou CRRC Times Electric Co., Ltd.





PART I COMPANY PROFILE AND GOVERNANCE

1.2 Corporate Governance System

- *Board of Directors*

As at the date of this report, the board of directors of the Company is comprised of 10 directors, each with different industry backgrounds and expertise. The Board fully represents the interests of shareholders and is accountable to the general meeting. It formulates the Company's development strategy and monitors the implementation of management and finance within the terms of reference as required in the Articles of Association and in accordance with the procedures set out in the Rules of Procedures of the Board, and takes long-term performance and returns as its priority. Five specific committees, namely strategy committee, audit committee, risk management committee, nomination committee and remuneration committee are established under the Board.

The Company has 5 independent non-executive directors, representing more than one-third of the total number of directors. Independent non-executive directors focus on the improvement of corporate governance and major decisions of the Company, express fair and objective advice on major matters and related transactions of the Company, and employ scientific approaches in decision-making of the Board so as to safeguard the interests of the Company and minority shareholders.

The Company held 8 meetings of the Board in 2018.

- *Board of Supervisors*

As at the date of this report, the board of supervisors is comprised of 4 supervisors, including 1 independent supervisor, 1 shareholder representative supervisor and 2 staff representative supervisors. The board of supervisors exercises supervision rights independently according to the law to safeguard the legal rights and interests of shareholders, the Company and its employees.

The Company held 3 meetings of the board of supervisors in 2018.

- *The Management*

The senior management of the Company is responsible for executing strategic decisions of the Board and management of daily operations of the Company. Daily supervision and annual assessment of the management are performed by the Board. The positions of Chairman of the Board and General Manager of the Company are held by different individuals, for which the duties are clearly defined to ensure the independence of the Board's decision and daily management and operation. The Company sets up annual goals for the respective subordinate units by dividing its strategic objectives for different years and layers and establishes an objective-based evaluation system for senior management and managers of subsidiaries, business units, the centers and functional units to form a performance-linked incentive and disciplinary mechanism. Assessment criteria and methodology are determined in the form of annual undertaking of target management responsibility and performance remuneration of the management is directly linked with results of appraisal.

PART I COMPANY PROFILE AND GOVERNANCE



- *Information Disclosure Policy*

In strict compliance with the relevant national laws and regulations as well as the requirements of the Securities and Futures Commission and The Stock Exchange of Hong Kong Limited (the “Hong Kong Stock Exchange”), the Company issues reports and discloses relevant information in a timely, accurate and complete manner to ensure that investors and stakeholders can keep abreast of the Company’s operation and management. Besides, the Company has also established dedicated departments, positions and specific mailbox to enhance communication with its investors. The Company strictly fulfils the confidentiality obligations in information disclosure and there was no significant premature disclosure or misstatement of information in 2018.

2. Risk Management and Internal Control

To ensure the smooth process of the Company’s production, operation, and business activities and keep them in line with the Company’s strategic objectives, operational objectives and shareholders’ vision and in compliance with regulators’ requirements, the Company has established a sound risk and internal control system. According to the requirements of relevant laws and regulations, such as the Company Law, Securities Law, Rules Governing the Listing of Securities on the Hong Kong Stock Exchange, etc., the Company has established a risk and internal control system with the Articles of Association as the general rules, and the Rules of Procedures for the General Meetings, Board of Directors and Board of Supervisors and working rules of professional committees as the main framework; established an internal control system consisting of three levels, i.e. the corporate system, fundamental management system and business management system; adhered to the development strategies of the Company; and formed an all-around risk management system through the effective implementation of all sections of comprehensive risk management.

2.1 Organizational System Construction

The Company is dedicated to building a sound, stable and effective risk management system and internal control system. The Board is responsible for the establishment, improvement and effective implementation of risk management system and internal control system of the Company. The risk management committee under the Board is responsible for reviewing the Company’s risk strategy, risk management system, work report on risk control, internal control system and procedure, regular assessment of risk management policy, supervision of the implementation of various rules and regulations and material operational decisions as well as assessment of significant matters. The board of supervisors is responsible for supervising the operation of the Company’s risk management and internal control system. The General Manager is responsible for organizing and leading the design, operation and assessment and evaluation of the Company’s risk management system and internal control system.



PART I COMPANY PROFILE AND GOVERNANCE

2.2 Regulating System Construction

The Company has prepared the Internal Control System Compilation covering operation and management of various business activities, formulated the Internal Control Manual, Internal Control Evaluation Manual, published the Comprehensive Risk Management Measures, Risk Assessment Procedure, Risk Alert Procedure, Assessment Rules for Comprehensive Risk Management and Internal Control Assessment Procedure, thereby improving the risk management and internal control system.

2.3 Detailed Implementation

In 2018, the Company emphasized on operational risk management, focused on the hotspots and difficulties in strategic operation, and conducted effective risk management and internal control. We conducted research on strategic risks of signal and communication industry for the first time which provided constructive recommendation on industry development. Self-inspection on overseas risks and inspection on material risks were conducted to prevent and control overseas risks by nipping the problem in the bud. We reviewed the implementation of relevant systems and procedures, enhanced the execution capability of all staff, and created the culture of working by rules and procedures. We implemented annual risk assessment by organizing different professional risk management teams of the Company to conduct dynamic assessment on different business risks, formed the database of risk incidents for 2019 and carried out followed-up management to ensure risks were under control. The Company also performed an annual internal control assessment to assess the effectiveness of the design and implementation of internal control of the Company in phases, which identified that the Company had no material deficiencies. Deloitte Touche Tohmatsu Hua Yong Certified Public Accountants LLP ("Deloitte") was engaged for internal control audit and the result of which indicated that there were no material deficiencies in terms of the design or implementation of the internal control of the Company. As for the general management issues proposed by Deloitte, the Company proactively organized rectifications and achieved closed-loop management.

PART I COMPANY PROFILE AND GOVERNANCE



3. Corruption Combat and Advocacy of Integrity

In 2018, the Company established the discipline inspection commission and discipline inspection and supervision department, improved the organizational structure of discipline inspection and supervision of the Company, revised and launched 13 management systems related to discipline inspection and supervision, which strengthened the discipline inspection and supervision mechanism. For supervision and enforcement of discipline, we persisted in prioritizing discipline, fully utilized the “four forms”, and implemented different policies for different cases to supervise the “key minorities” and “key areas”. We also actively explored “embedded” supervision to gradually achieve precise, close-range and comprehensive supervision. We carried out educational activities to promote anti-corruption for the party, further facilitated the construction of integrity culture, and promoted the working idea of “facilitating the development of a company by self-cultivation, hard work, integrity and accountability”, so as to guide the thoughts and minds of our staff with education and culture.

In 2018, there was no case of corruption in respect of the Company or its employees.

III. IMPORTANT HONORS OF THE COMPANY

No.	Honors
1	Liu Ke'an was included in the National Special Support Program for High-Level Talents (the “Ten Thousand Talents Program”)
2	Liu Ke'an was awarded the CRRC Technology First Prize for the research and development of traction network system for China's standard EMUs
3	Liu Guoyou was included in the National Special Support Program for High-Level Talents (the “Ten Thousand Talents Program”)
4	Shang Jing was recognized as an outstanding engineer in the 3rd Outstanding Engineer Award
5	Yu Kang was recognized as one of the Top Ten Outstanding Youth of CRRC
6	Zhou Guifa was recognized as a CRRC scientist
7	Lu Xiangyang was recognized as a CRRC scientist
8	Shang Jing was recognized as a chief technical expert of CRRC
9	Yang Weifeng was recognized as a chief technical expert of CRRC
10	Zhang Hua was recognized as a chief management expert of CRRC
11	A key technology in photovoltaic sector was awarded the Second Prize of the Hunan Science and Technology Progress Award
12	The case of IE application was awarded the First Prize in the National Industrial Engineering Application Competition
13	After-sales Service Center of CRRC Times Electric was recognized as the “Model Workers’ Home in Hunan Province”
14	Yang Yan in Manufacturing Center of CRRC Times Electric won the champion of IPC China in 2018
15	Baoji Times of CRRC Times Electric was recognized as the “National Model Enterprise of Technology Innovation”
16	The project of “Complete Set of Technology and Equipment for Operation Safety Protection of High-Speed Railway Overhead Catenary System” was awarded the Second Prize of the National Science and Technology Progress Award
17	The project of “Demonstration of Low-to-Medium Speed Maglev Transit System Vehicles and Key Technology Integration” was awarded the First Prize of the Hunan Science and Technology Progress Award
18	The project of “Catenary Railcars” was included in the Third Batch of National Single Champions in Manufacturing Industry

PART I COMPANY PROFILE AND GOVERNANCE

No.	Honors
19	JJC Catenary Maintenance Railcar was the only product of CRRC which won the award of "National Single Champion Product in Manufacturing Industry"
20	The project of "Developing the Strategic and Organizational Performance Management Capability based on the Management System Integrating IT Application with Industrialization" was awarded the CRRC Second Prize and the Second Prize for Results of Modernization and Innovation of Corporate Management in Hunan Province
21	The project of "Construction of Overseas Factories and Establishment of Operation Maintenance System by Rail Transit Enterprise" was awarded the First Prize for Results of Modernization and Innovation of Corporate Management in Hunan Province



PART I COMPANY PROFILE AND GOVERNANCE



IV. CORPORATE VALUE AND STAKEHOLDERS

1. Corporate Values

Core value:	Walk the righteous path with the righteous mind and do good deeds with good intention
Organizational climate:	Positive and harmonious, candid and honest, open and inclusive
Work style:	Strong commitment, sense of timeliness and pursuit of excellence
Spirit of enterprise:	Integrity, Dedication, Innovation and Excellence
Missions:	Connecting the world to benefit human
Vision:	Becoming a leading company group with top multinational operation and rolling stock equipment as its core business

Strategic Guiding Ideology in 2018:

The Company adopted an open mind, set up focused strategic goals and leveraged the innovative platform to enhance refined management and achieve major breakthroughs in terms of “system, industry, technology and efficiency”. The Company also continued to enhance the crisis awareness, implemented the “Three-year Action Plan”, established a dual-track system, reshaped the competitive advantages, made innovation, changes and refinement to enhance the quality, thereby facilitating the continuous improvement of CRRC Times Electric.

PART I COMPANY PROFILE AND GOVERNANCE

2. Concerns of Stakeholders

With the core goal of sustainable development, the Company pays close attention to various stakeholders, continuously strengthens exchanges and communication with them, fully understands and collects their requests and makes responses positively in view of the actual situation of the Company. The Company has always strived to cooperate with stakeholders to create and share value and promote sound and rapid development of the Company.

Stakeholders	Ways of Communication	Requirements & Expectations	Main Indicators
Government	Laws and regulations, release of policies, meetings, theme reports, report forms and visits	Complying with laws and regulations, ensuring tax revenue, providing job opportunities, and developing rail transit equipment industry	Total tax income and new job opportunities created
Customer	Collecting comments, daily liaison and visits by sales representatives	Providing products and services with good quality and competitiveness, and improving them continuously	Customer satisfaction rate and products qualification rate
Investors	Regular report, unscheduled announcement, general meetings and circulars	Continuously enhancing company value, preventing corporate risks and ensuring sustainable development	Profits, return on equity, gearing ratio, owner's equity
Employees	Proposal of Workers' Congress, employee mark-based reward system, executives reception day, consultation, democratic assessment, employee exchange forum, etc.	Providing employees with safe, fair and comfortable working environment, more benefits and growth opportunities	Employee satisfaction and loyalty, turnover rate and investment in employee training
Suppliers	Suppliers meeting, negotiations on contracts and agreements, regular visits, tendering meetings and collecting comments	Long-term cooperation for reasonable profits	Project bidding, claim on quality defect from suppliers, etc.
Community	Communications by means of suggestion box and questionnaire surveys, festival parties, active participation in and support for community activities	Well-organized manufacturing to promote a prosperous and harmonious community with safe and healthy living environment	Investment in community constructions, times of participation in community activities and amount of donations

PART I COMPANY PROFILE AND GOVERNANCE

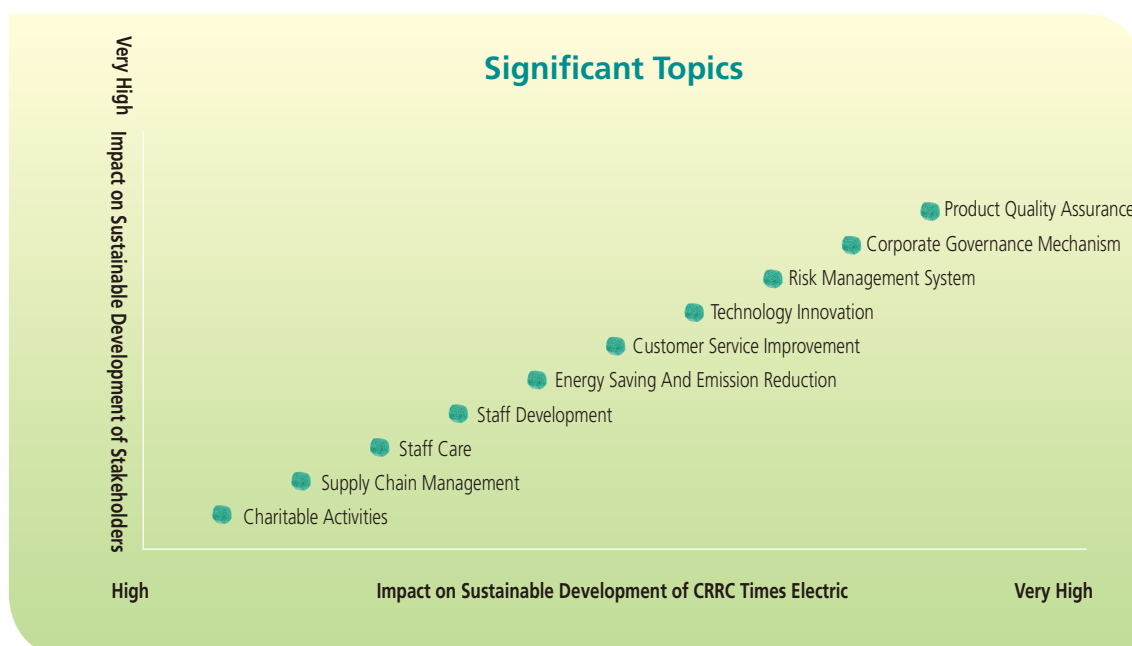
3. Determination of Significant Topics

The Company continued to improve the process for the determination of content for reporting with reference to the requirements of the ESG Reporting Guide of the Hong Kong Stock Exchange. The Company enhances the interaction with stakeholders through various means, identifies and determines material issues that concern stakeholders, and eventually determines the extent and scope of disclosure, so as to ensure a more accurate and comprehensive disclosure of information.



Source of issues	Standards of selection
Guidance on Standards of Social Responsibility	Contribution to sustainable development
Company management and staff	General concern of stakeholders
Government and investors	Emphasis on the Guidance on Standards of Social Responsibility
Suppliers and customers	Compliance with the Company's needs of strategic development
Community	
Analysis of information from various channels	

Results of determination of significant topics





PART I COMPANY PROFILE AND GOVERNANCE

V. OPPORTUNITIES AND CHALLENGES

Currently, the PRC economy is under pressure and the growth rate continues to slow down due to the combined effect of shifting into new gears in economy, teething problems in restructuring and digestion of previous stimulation policy. While the overall economy achieves steady development, emerging economies gain momentum rapidly and remains strong. In particular, the high-technology sector and equipment manufacture sector see accelerating growth. With the implementation of the "Go global" strategy for China's railways and the changes in external environment such as further opening up of domestic rail transit market, the Company will face new challenges amidst opportunities.

- **Opportunities**

China's economy has great growth potential in the future. The progress of reform will determine the long-term economic performance. The government has sufficient political reserves and resources to handle the risks. After the rapid development in the recent years, China's rail transit industry has laid a sound foundation for the establishment of a comprehensive railway transportation network across the country with the development goal of achieving "tri-networks integration" of trunk railway, intercity rail and urban transit in the future, bringing new opportunities for the growth of rail transit equipment market. In addition, leveraging on the urbanization development, the investment demand for domestic rail transit market has continued to rise. Hence, the intercity rail will be the focus point for the construction of high-speed railway network during the "13th Five Year" period.

Being a new international strategic framework for China, the "Belt and Road" has brought many development opportunities to the PRC economy. The focus in the near term is to attain the "inter-operability of infrastructure, interconnection of access, convergence of sectors and introduction of resources", while the long-term goal is to achieve the "interconnection of business and culture, integration of regional economies and mutual prosperity". The construction of rail transit has gradually become a global trend. More than 100 countries around the world will invest in railway construction and the annual average procurement needs of rail transit equipment are expected to exceed USD70.0 billion. China's high-speed railways undertakes the mission of promoting domestic high-end equipment to the world, which facilitates the overseas development of relevant enterprises.

At this stage, as China currently encourages innovation, the Company's products with proprietary intellectual property will become more competitive in the domestic market. The semiconductor industry as a national strategic industry, in particular, as IGBT is in line with the national industry development trend of environmental protection and energy saving, it will be presented with great opportunities. Electric passenger vehicles will become the trend of personal transportation and have great development potential in the future.

PART I COMPANY PROFILE AND GOVERNANCE



• *Challenges*

While the high-speed railway, intercity rail and urban transit sectors are flourishing, and as foreign, local and private enterprises enter the market, the Company's products will be exposed to great pressure in terms of market competition and product price. The application of new technologies such as lightweight design, axis control, SiC converter and automatic driving, the extensive use of Internet technology and the development of Industry 4.0 will pose higher requirements and challenges on transformation of traditional industries. The emergence of new models such as mechanical and electrical turnkey solution, PPP, BT and BOT will require the Company to increase its efforts in research and practice of these new business models.

• *Our Solutions*

1. To actively respond to the pressure from external competition, and continue to enhance the stability and reliability of products.
2. To further enhance its cost awareness and improve the ability of overall cost reduction.
3. In terms of matching development of the general mechanical and electrical contracting and maintenance and repair industry, the implementation of proprietary signal system project and the mass production of electric motor system for passenger vehicles, the Company will build new capabilities to adapt to new business model and enhance the profitability of new products, therefore it will increase input in products that go along well with the new model and the growth of the vehicle industry.
4. The Company will strengthen its ability of international operation by increasing the efforts in attracting and cultivating international talents, management of overseas companies and utilization and collaboration of local resources.
5. The Company will strengthen the management of new industries and enhance its ability of industrialization.



PART II TECHNOLOGICAL INNOVATION AND PRODUCT RESPONSIBILITY

I. TECHNOLOGICAL INNOVATION

The Company's technological innovation management always adheres to the tenets of serving technological innovation and launches various activities to enhance management performance, including excellent management and refined management. These activities increase the intensity, breadth and depth of scientific research project management, qualification and result management, external scientific technology reporting management as well as management of expertise and engineering development and standardization. The Company also facilitates cost reduction and efficiency enhancement through research and development and revises and improves relevant management procedures and systems of research and development to enhance the working efficiency and quality, thereby safeguarding the orderly development of daily work and steady advancement of various key works at all levels.

1. Introduction to Technical Research and Development

1.1 R&D Management Mechanism

The Company attaches great importance to the establishment and improvement of R&D management mechanism, and has established a Technical Committee, which comprises the deputy general manager in charge of technology, deputy general engineer, chief expert, and technical supervisors in all business units (departments). The Technical Committee provides support for the decision making in relation to scientific research technology of the Company. Based on the advanced concepts and ideas such as CMMI and integrated product development ("IPD"), the Company has established a multi-layer and collaborative R&D operation model integrated with fundamental frontier technology, generic technology, platform technology and application technology. It has also established a lean R&D system and advanced information systems such as product lifecycle information platform and knowledge engineering platform, which support the orderly operation of the Company's technological innovation business. The Company fully implemented project management for proposal, execution and completion of scientific research, and established and improved the rules and regulations for project management – Administrative Measures for Scientific Research Projects and Measures for Assessment and Incentive of Significant Scientific Research Projects. It also piloted the post-assessment of significant scientific research projects to increase the R&D benefits.

PART II TECHNOLOGICAL INNOVATION AND PRODUCT RESPONSIBILITY

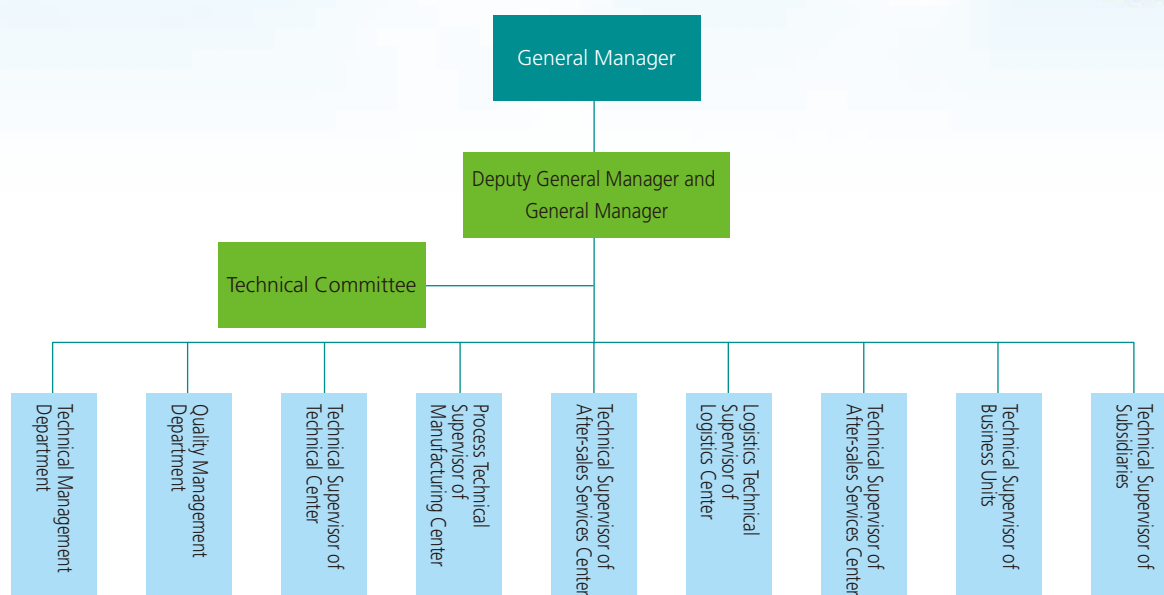


Chart: R&D Management Institution

1.2 Investment in Scientific Research

Investment in technological innovation provides basic guarantee for strengthening the Company's independent innovation ability. The work in this regard adheres to two main concepts of "innovation" and "benefit", aiming to achieve sustainable development of the Company and striving to set another new record in operation results by leveraging its technological R&D. The Company continued to increase its investment in technological innovation, which accounted for over 9% of sales amount in the year. In 2018, the Company approved 670 proposals of scientific research projects.

1.3 R&D Team and Advantages of Hardware Resources

The Company's scientific research and technological personnel accounts for over 48% of the total number of employees. On the basis of highly educated talents, a professional research and development team with high qualities and efficiency has been developed through a comprehensive talent training system.

The Company also has strong capabilities in scientific research and experiment, testing and inspection and system production, and owns a number of specialized production bases. Among which, the Company's power semiconductor production base mainly produces bi-polar power rectifiers, thyristors, GTO, IGCT and IGBT. The Company also has the first high-power IGBT packaging manufacturing base in China. The inspection and testing system is comprised of over 20 laboratories, including vehicle-mounted electrical systems lab, electrical machinery lab, large-scale vibration testing system lab, electrical equipment reliability and environmental engineering lab, passenger car electrical system lab, large-scale engineering machinery electrical system lab, networking product consistency lab, simulation lab, information technology application lab etc., covering research test, type test and factory test in different business sectors of the Company.

PART II TECHNOLOGICAL INNOVATION AND PRODUCT RESPONSIBILITY

2. Technological R&D Results

2.1 Reporting

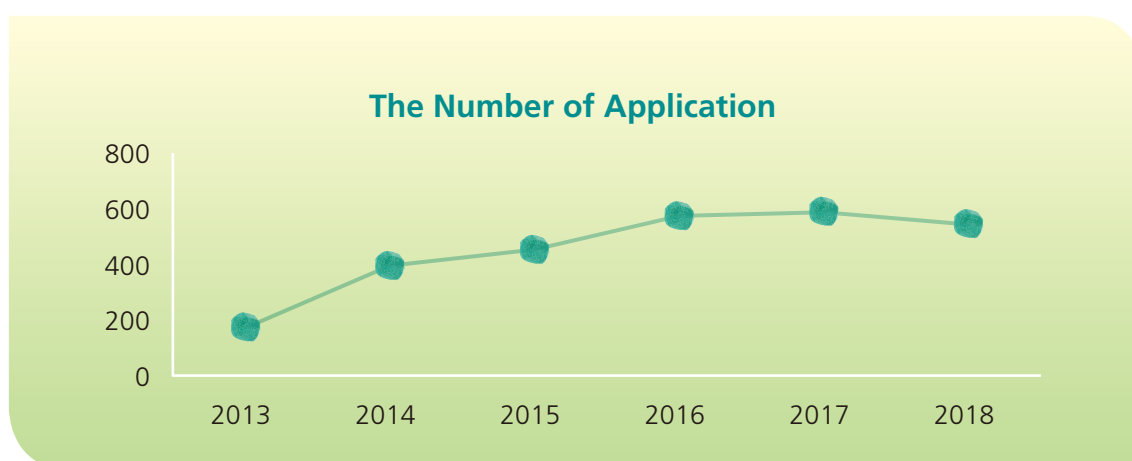
In 2018, 22 external technology projects were approved, including: 6 national projects, 10 provincial-level and city-level projects, 1 China Railway project, 2 CRRC special major projects and 3 CRRC major and key projects. In 2018, the Company fully participated in the last two target projects under the “13th Five-Year” national key R&D program. During the “13th Five-Year” period, the Company took the lead in two projects and participated in seven projects under the Special Program. The Company deeply participated in the development of highly reliable on-board power and electronic integration system for commercial vehicles, which signified the Company’s leap to a leading position in core technology of electric vehicles.

The Company also made its first breakthrough in the key special area of technology and equipment for public security risk prevention and control and emergency response by taking the lead in R&D of intelligent underwater bulldozer, which effectively consolidated and enhanced the Company’s position in new industries.

2.2 Patents

In 2018, the Company applied for a total of 543 patents, with 346 patents authorized, including 219 invention patents. By the end of 2018, the Company has cumulatively applied for 1,927 patents, 963 of which were invention patents.

Year of Application	Number of Application
2013	171
2014	395
2015	453
2016	574
2017	587
2018	543



2.3 Awards

During the year, the Company was successfully granted 20 provincial-level and ministerial-level or above awards. Among those awards, the Company has been awarded with 1 National Technology Invention Award, 1 National Science and Technology Progress Award, 6 Hunan Province Science and Technology Progress Awards and 4 Science and Technology Awards issued by China Railway Society. It also completed 20 scientific achievement appraisal projects.

PART II TECHNOLOGICAL INNOVATION AND PRODUCT RESPONSIBILITY



3. Management of Significant Projects

In order to ensure the sustainable development of its significant scientific research projects, the Company insisted on the rolling development mechanism of significant projects and continuously injects new ideas and concepts to guarantee the continuous enhancement of technical strength for scientific research. In early 2018, after several reviews by the experts from the Technical Committee, it was finally determined that 51 scientific research projects with great strategic significance or economic benefits would be added as significant projects. The Company also implemented an assessment and incentive system for significant scientific research projects, put into practices the weekly reporting, monthly reporting and monthly regular meeting system and effectively pushed forward the process control and objective management of significant projects, which facilitated the annual targets for 94 ongoing significant research projects in 2018. Through strict process control, the general progress of projects was well under control; of which 34 projects were completed, with an overall project completion ratio of 97.2%.

Examples of major project implementation:

3.1 Research and Development of Electrical Systems for 250km/h Standard EMUs

In 2018, the Company mainly completed the research and development and type testing of traction converter, network control system and charger unit, and commenced small scale production. This project standardized the control logic and protective action of traction converters on 250km/h standard EMUs of different platforms. The network control system adopts the new G300 platform, and the chassis is equipped with self-diagnosis and single board identification functions. Standardized toolchain software is adopted to enable software update, data download, data monitoring and other relevant functions for the network equipment of the whole vehicle.

3.2 Research and Development of On-board Catenary Operation Inspection Device

This project has completed test run, the core results and key technical indicators of which met relevant technical requirements, and it passed the CRCC certification for railway products in 2018. This device enables online catenary inspection and monitoring of pantograph-catenary matching condition, and the inspection result can be used as guidance for catenary repairing, which provides strong support for safe operation of high-speed rail and is well recognized by customers.

3.3 Research and Development of Electrical Traction System for Overseas Project

In 2018, the Company mainly completed type testing and group testing and applied the DC1500V and DC3000V dual voltage power supply and 130km/h metro train for the first time. Products supplied for this projects include traction inverter, auxiliary inverter, high voltage electrical control panel, buck converter, on-grid contactor panel and workshop power control panel. The first train for this project was delivered in 2018.

3.4 Research and Development of Automatic Driving System for Locomotive

In 2018, the Company completed the system solution and technology design, research of key automatic driving technology, hardware prototype trial production, control software development, ground simulation test, installation testing and trial test run, and is currently at the stage of official test run. Locomotive automatic driving is a multidisciplinary integrated technology which involves the integration of various technologies including the establishment of route data model, research on automatic optimization and control algorithm, big data analysis technology and simulation test technology. The success in research and development of this project signified the Company's breakthrough in technology assisted driving which enabled the automatic operation control of freight locomotive through automatic driving system. This is the first case of research and development and application of freight train automatic driving system in China, which will significantly promote the intelligent development of locomotive sector.



PART II TECHNOLOGICAL INNOVATION AND PRODUCT RESPONSIBILITY

3.5 Research and Development of TMP-PI Permanent Magnet Simultaneous Traction System Platform

In 2018, the Company mainly completed prototype production, type testing and group testing. It is estimated that if half of the metro trains in China adopt the permanent magnet traction system, the annual carbon dioxide emission can be reduced by over 1 million tonnes, thereby making great contribution to the society in energy saving and emission reduction. The result of this project will be used in China's urban railway sector in the future.

3.6 Development and Application of 35kV/100MVA Water Cooling SVC Device

In 2018, the Company mainly completed the research and development of SVC device and passed the prototype test run. All functioning and technical indicators met the requirement for actual operation. The device has commenced on-site and on-grid operation for over four months without malfunction. The device in this project can make quick adjustment to reactive power, enhance the power factor, stabilize the system voltage, solve the problem of three-phase unbalance, improve the power quality and ensure the safety and stability of power grid, which will bring economic benefits to the society.

4. Innovation Influence

In 2018, the Company continued to build the innovation development platform and organized experts to formulate and publish 12 international standards. In particular, the Company participated in the formulation of IEC 62995:2018 "Railway applications – Rolling stock – Rules for installation of cabling" as the main drafter and other 11 standards as the contributing drafter. The Company also formulated and published 11 national standards, 1 industry standard and 19 association standards. In 2018, the Company received 1 China Patent Silver Award and 1 China Patent Excellence Award, was selected as one of the most influential enterprises in the PRC's electronic information industry and shortlisted as a top 100 corporate in terms of revenue from electronic information and software business in the country. It kept abreast of the latest trend in the world and continued to advance the research and development of the fully automated driving platform. Furthermore, it achieved major progress in special technology research, which included on-board catenary operation inspection, new railway maintenance machineries related products, IGBT, LKJ, smart maintenance, automatic passing phase insulators for electronic switches, permanent magnet traction system and frequency converter for central air conditioning system and data mining GPUs.

PART II TECHNOLOGICAL INNOVATION AND PRODUCT RESPONSIBILITY

II. PRODUCT RESPONSIBILITY

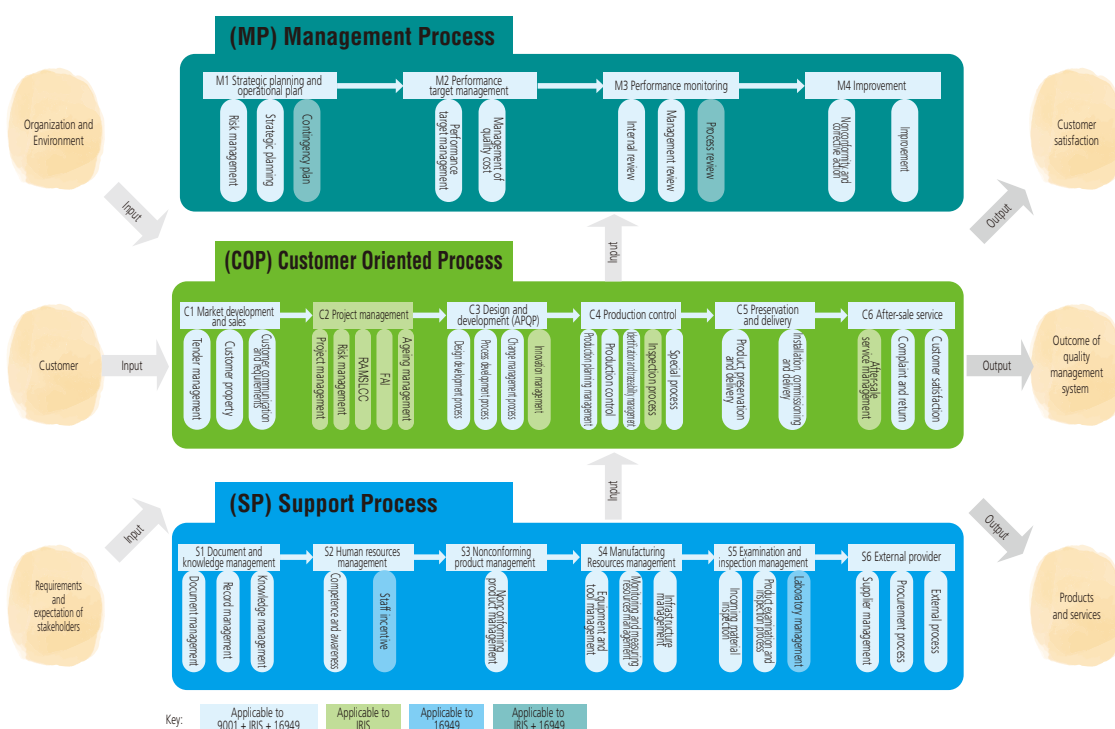
1. Product Quality Management

The Company has always considered product quality as its core value, for it is essential to the very existence of a corporation. Adhering to the policies of "Optimizing platform for sharing of knowledge, Improving the ability of technological innovation, Focusing on quantitative analysis of processes, Setting up life cycle management, Insisting on enhancement of scientific prevention, Enhancing awareness of quality and safety, Paying attention to details and Pursuing customer satisfaction" for quality of its product realization process and customer services, the Company continuously carries out researches and fosters on-going improvement to achieve effective control on all aspects and processes from product design to delivery through a series of assurance mechanisms.

1.1 Quality Management System and Certification




The Company has established a complete quality assurance system based on the ISO9001:2015 quality management standard. It has also complied with the requirements of ISO/TS22163 standard (IRIS 03 International Railway Standard) to implement quality control during the production process of its products and the realization process thereof, while keeping suppliers under strict management and actively promoting project management and RAMS (reliability, maintainability, availability and safety) management.

Quality System Management Mode:




PART II TECHNOLOGICAL INNOVATION AND PRODUCT RESPONSIBILITY

System certificates:

Types of system	Certificate	Description
ISO9001		<p>The Company passed the ISO9001:2000 version quality assurance system certification of British Standards Institute Limited (BSI) in 2005.</p> <p>It passed the review for the certification (2008 version) in November 2009.</p> <p>In October 2010, TUV Rheinland (Guangdong) Co., Ltd. carried out the review.</p> <p>The Company passed the ISO9001 certification of Bureau Veritas Certification (Beijing) Co., Ltd. in December 2014.</p> <p>The Company passed the review for the certification of German DQS (2015 version) on 28 October 2017.</p>
International Railway Industry Standard (IRIS)		<p>In October 2009, the Company passed the IRIS 01 certification of TUV Rheinland (Guangdong) Co., Ltd.</p> <p>It passed the IRIS 02 certification in October 2011.</p> <p>The Company passed the IRIS Certification of Bureau Veritas Certification (Beijing) Co., Ltd. in October 2014.</p> <p>The Company passed the review of German DQS in October 2017.</p>
CMMI Level 3		<p>The Company passed the CMMI-system Level 3 certification in December 2009.</p> <p>It passed the supervisory review in December 2013 and December 2016.</p>

PART II TECHNOLOGICAL INNOVATION AND PRODUCT RESPONSIBILITY



Types of system	Certificate	Description
EN15085-CL1 (Welding Certification System for the Rail Transit Industry)		<p>The Company passed EN15085-CL4 German SLV certification in November 2012.</p> <p>The Company passed the EN15085-CL1 certification of Bureau Veritas Certification (Beijing) Co., Ltd. on 5 July 2014.</p> <p>The Company passed the EN15085-CL1 certification of German TUV in 2017.</p>

Quality Awards:

First Hunan Governor Quality Award in 2011
 Industrial Enterprise Quality Benchmarking Enterprise by Ministry of Industry and Information Technology in 2013
 Hunan AA Enterprise for Industrial Product Quality Classification Regulation in 2013
 AAA Enterprise of Hunan for Quality Credit in 2013 and 2017
 Excellent enterprise of Hunan Province for quality management group activities for seven consecutive years
 National excellent quality management group for seven consecutive years
 2nd China Quality Award in 2016

1.2 Quality Monitoring Method

The Company has set up and improved a sound and comprehensive system of quality management and assurance system throughout the product life cycle including marketing, design and development, procurement, manufacturing and product services etc. at a preliminary stage through a number of system certifications and effective monitoring of its processes.

Process Monitoring:

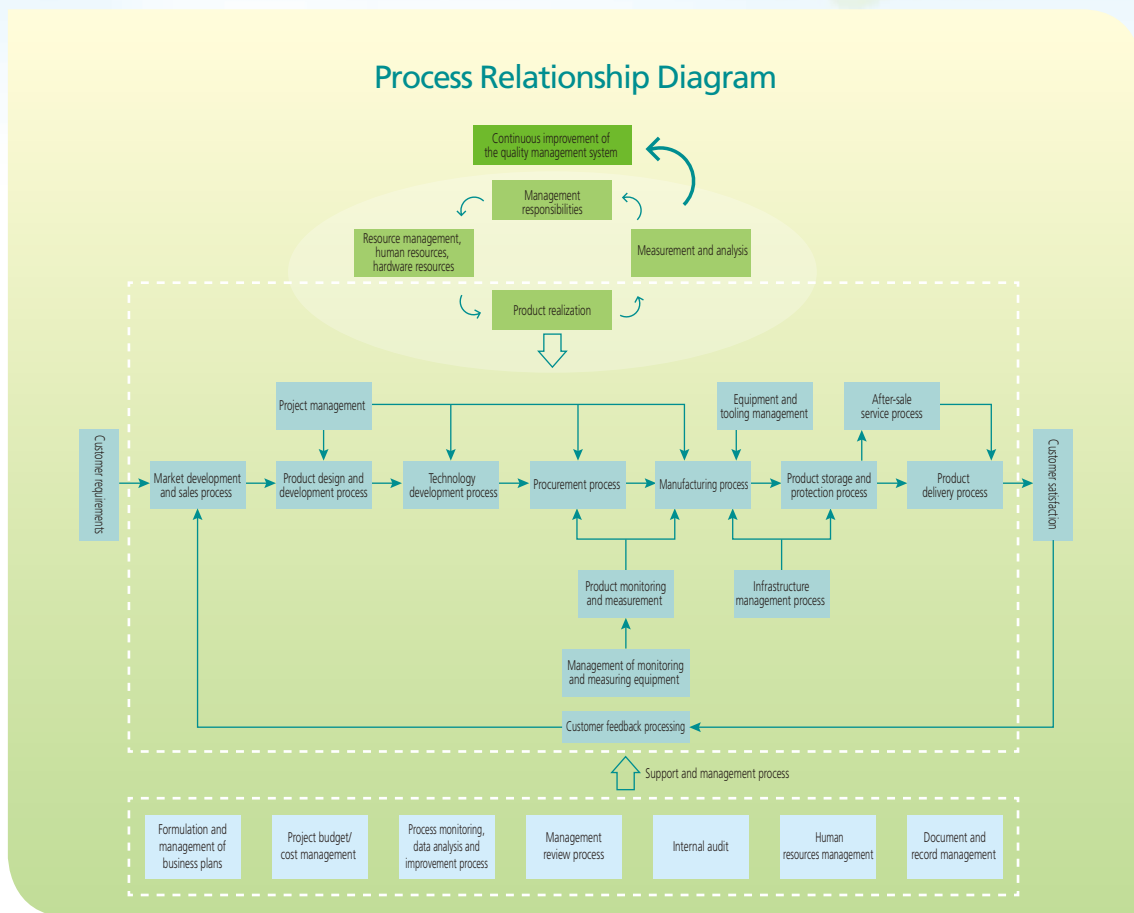
– Quality Indicators for Measurement and Continuous Improvement of System

The Company has established an indicator measuring system for the entire process, including sales, R&D, manufacturing, logistics, procurement and service, etc., which has enabled the Company to comprehensively define and quantize process quality and carry out measurement and monitoring.

– Internal Audit and Inspection

The Company has established a multi-dimensional continuous improvement system to ensure quality control through process review, process testing, internal and external audits, regular management review, ad hoc quality inspection, data analysis, process improvement, etc. With this, the Company can therefore identify opportunities for improvement and request for delegation of responsibilities, implementation of plans as well as tracking and verification for matters which require improvement, with a view to guaranteeing the achievement of the improvement goals and ensure continuous improvement of the whole quality management system.

PART II TECHNOLOGICAL INNOVATION AND PRODUCT RESPONSIBILITY



– Quality Management of Design and Development Process

Complete Product Development Process System:

The system supports the management and quality control of the entire lifecycle of mechanical products, electric products and software products development. Project development is carried out on a project basis and quality control is carried out throughout the development including design, operation, testing and the achievement of design from user requirements to product model finalization.

Platform-based development for Product and Design:

With continuous accumulation and building up relatively complete databases in terms of standards, guidelines and examination of products, technologies and processes, the Company incorporates the databases into the IT information systems and applies them to quality control of new product designs. The Company has also built up a platform for homogeneous product lines featuring huge pool of data that has been widely used and undergone examination for its reliability so as to improve the quality and reliability of product design.

PART II TECHNOLOGICAL INNOVATION AND PRODUCT RESPONSIBILITY



– Quality Management for Production and Manufacturing Process

The Company attaches high emphasis on improvement of technique and adheres to the guiding principle of “paying attention to details” and fully implements refined production by adopting an on-site oriented approach. Accordingly, it establishes standardized technique development process, technique management procedures and working standards for each position. Personnel holding relevant certifications are required for key positions.

A complete set of documentations for operation and inspection:

The Company provides detailed and comprehensive guidebooks of operation for the site in which each step of product production technique is prescribed with illustrations. With which, workers at the site can clearly and easily understand each step and avoid faulty operations. Meanwhile, corresponding guidebooks for product inspection, inspection checklists, QC schematic diagrams, etc. are also maintained at the site so that workers can conduct inspection with photos taken for each key process in accordance with these documentations.

Complete Technical Testing System:

The Company’s manufacturing bases are equipped with a complete technical testing system including AOI, flying probe test, online test, X-RAY inspection to check the welding quality of circuit boards and high and low voltage lines inspecting device to check the quality and reliability of wiring. A number of technical programs and measures are adopted to check the sealing features of cabinets. The above measures ensure that the whole production process is timely and effectively monitored from a single board to the whole set including cabinet processing.

Stringent Control over Electronic Components:

The Company has also established a sound ESD and MSD control system for the manufacturing bases to exercise stringent control over electronic components in terms of workers, machines, materials, methods, environment and measurement, which in turn helps ensure product reliability.

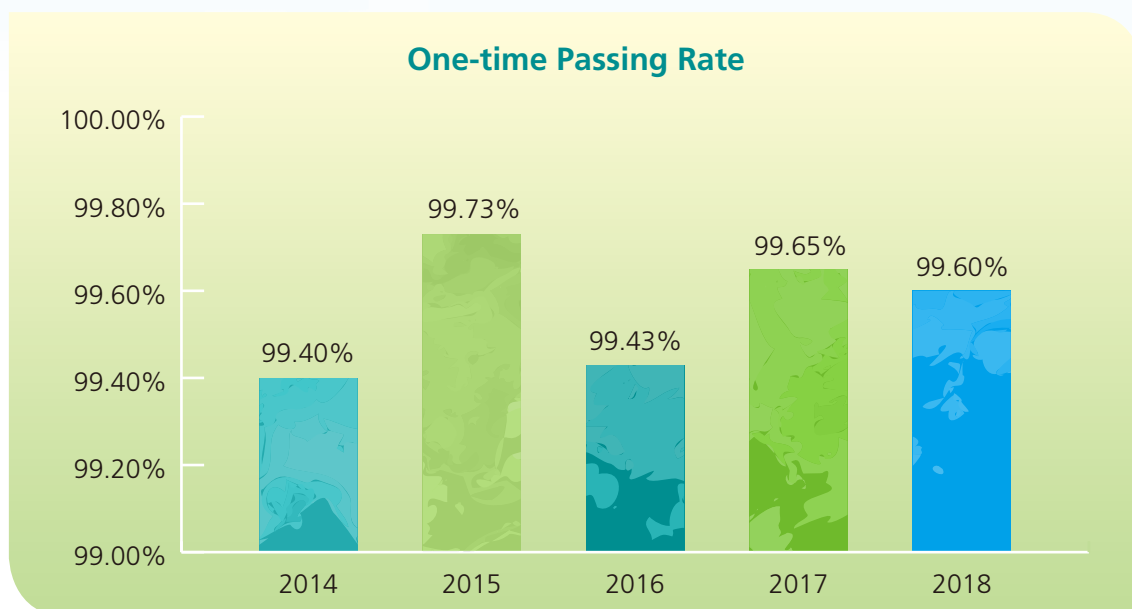
Sound Management System of Outsourcing Suppliers:

The Company has set up an outsourcing control group and adopted an inspection mode pursuant to which on-site inspectors will carry out inspection at the warehouse. In addition, the Company also established a supplier on-site inspection system and held meetings with outsourcing suppliers for the discussion of supplier performance and quality improvement on monthly basis. Therefore, the Company improved the quality management mechanism in terms of development, prototyping, small scale trial production to mass production by outsourcing suppliers.

PART II TECHNOLOGICAL INNOVATION AND PRODUCT RESPONSIBILITY

— Product Delivery Quality

The one-time passing rate of the Company's products remained at above 99% for the last five years.



2. After-sales Service

2.1 After-sales Service Network

In 2014, the Company introduced the service philosophy of “providing fast, effective and satisfactory services” in the after-sales service area, aiming to respond to customer needs as soon as possible, and provide comprehensive services to customers in an orderly and orderly manner. For more than ten years, the after-sales service team has grown from a team of sixty to seventy people to a professional team of more than 300 employees. We have set up service offices in Beijing, Shenyang, Shanghai, Xi'an, Wuhan, Zhuzhou, Guangzhou, Chongqing, Lanzhou and other cities and established overseas service offices in America, Africa, Southeast Asia and other areas, which formed the global after-sales service network covering major customers, regions and products. Meanwhile, taking into account the overhaul plan of China Railway Corporation, the Company completed the preliminary planning for the domestic maintenance business by setting up inspection and maintenance branch in Qingdao and inspection and maintenance bases which possess advanced inspection and maintenance capabilities for its own platform products in Wuhan, Guangzhou, Shanghai and other places.

The Company has set up a three-level service management model, under which the service network is linked up by the Company's service headquarters, service office and service station. Should our customers have any requirement, the Company guarantee to promptly respond with staff deployed to the site in 8 hours and solve problems within 24 hours to gain customers' confidence.

PART II TECHNOLOGICAL INNOVATION AND PRODUCT RESPONSIBILITY



With the after-sales service information platform as our support, the Company has set up two hotlines: 800 878 8968 and 400 8899 927, and 64 workstations to maintain communication with customers at any time and ensure after-sales services, technical supports, business consultancy, quality feedbacks, complaints, suggestions, and comprehensive information consultation at all times.



2.2 After-sales service platform and information construction

Fully promoting the construction of Green Shade Service Platform (MRO). Green Shade Service Platform was officially launched on 31 October 2018, after more than 100 discussion sessions, arranging more than 2,000 BOM sheets, data collecting for 10,000 on-line locomotives, checking more than 100,000 spare parts, surveying over configuration of more than 300,000 parts and sorting out of more than 3 million items of configuration data. The successful implementation of the first phase of the MRO project further streamlines workflow and data specifications. Through the core functional modules such as basic data, configuration management, service management, maintenance management and material management, the Company realized the data interaction within the six systems and established data links between marketing, project, design, production, delivery, service and quality. The short board in the Company's product business data has been completed, which indicates that CRRC Times Electric has initially established a product lifecycle management platform with SBOM and product configuration as the core in the field of rail transportation, realizing the precise configuration of components, products and vehicles and laying the foundation for the subsequent implementation of archive management of "one document for one car and one document for one thing", quality data tracking and preventive maintenance.

Fully promoting the maintenance technology development process and information construction. In combination with the process construction for the IPD project of the Company, the Company has formulated the "Technology Development Process for Maintenance Business", completed the construction of the maintenance technology system framework and achieved the stabilization for the maintenance technology system in the PLM system and its official launch. Through the release of the inspection application technology development process, the stabilization of the maintenance technical procedure development process, the establishment of the maintenance application technology file system and the improvement of the product coding and functions in the information system, the Company has realized the shift from offline to online for the maintenance technology development and initially realized the formalization, informationization and systemization of the maintenance technology development.

PART II TECHNOLOGICAL INNOVATION AND PRODUCT RESPONSIBILITY

Fully promoting the construction of intelligent maintenance platform. The Company launched the third phase of Qingdao E-Smart Maintenance Project and the OES was successfully launched, realizing the information management during the EMU maintenance process; constructed the intelligent system for tightening the bottom plate and realized the torque fastening and error prevention function of the EMU, improving the assembly efficiency by 33.3%; built the automatic assembly line of CI cabinet (module) and realized pipeline production for the CI rhythmed production mode applying station system of EMU, improving the module assembly efficiency by 87.5% and effectively reducing the investment of human resources.

2.3 After-Sales Service Team Management

The Company carried out the in-depth development of the talent echelon. The Company fully implemented the strategy of “polarization” and took various measures to train maintenance (service) technical experts. Through the “apprenticeship system”, skill competition, manager responsibility system, director rotation, green shade service qualification certification and other forms of specialized management and technical personnel training, the Company has created a team of “fine soldiers and strong generals”. During the year, the Company organized more than 30 key staff to participate in the external training of management upgrades; completed post qualification for 613 persons, realizing the annual target of “working with qualification” for staff working at site; achieved new breakthroughs in the evaluation of employee skill level, during which 5 persons reached L4 and 31 persons reached L3; also included laborers in the scope of skill level evaluation, with a participation rate of 90%.



PART II TECHNOLOGICAL INNOVATION AND PRODUCT RESPONSIBILITY



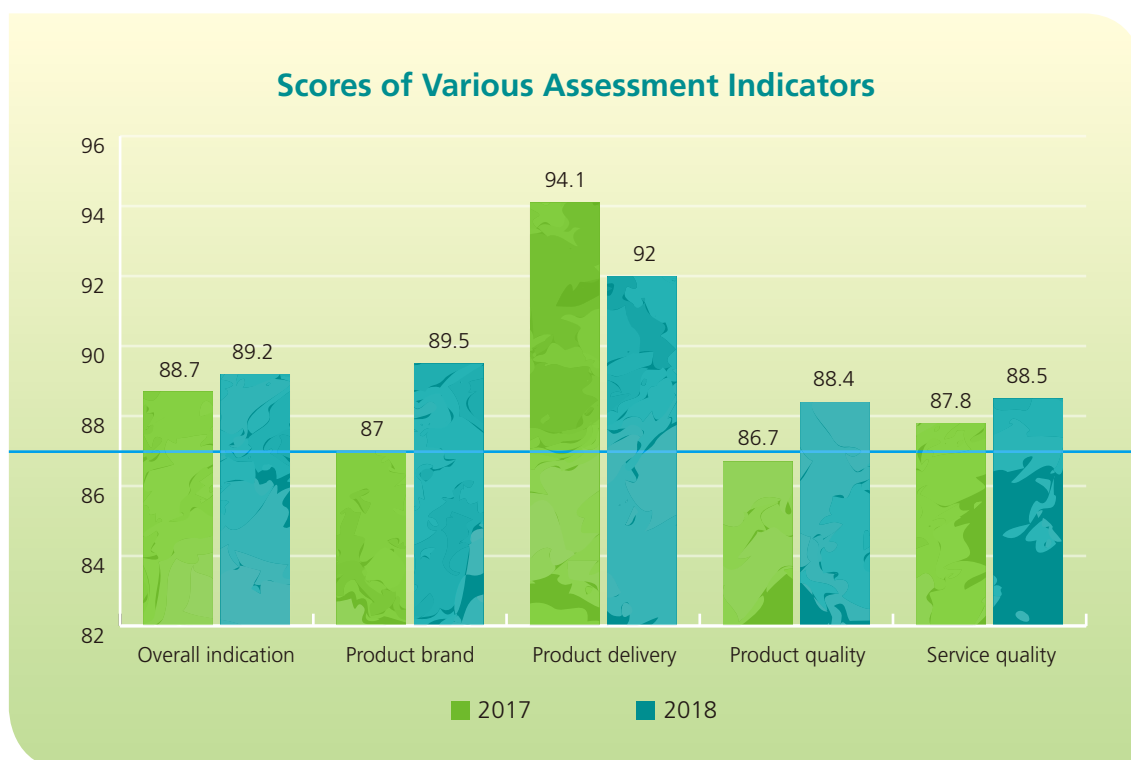
3. Customer Satisfaction Survey and Customer Complaints

3.1 Customer Satisfaction

The Company always takes the continuous improvement of product and service quality and continuous enhancement of customer satisfaction as its goal. Every year, the Company takes many forms to collect customers' opinions and suggestions on our products and services, including questionnaire survey, interview of customers, telephone inquiry and product promotion event, and immediately takes corresponding measures to make improvement.

The general principle for 2018 external customer satisfaction survey of CRRC Times Electric was: **focusing on rail transit products while giving consideration to other traditional products**. Products under this survey mainly include railway transportation electric drive control system, security monitoring devices, rail engineering machinery, etc.; and vehicle types involved in this survey include urban rail transit, harmony type high-power alternative transmission locomotive, high-speed EMUs and other traditional products such as testing equipment. This survey involved 148 users, including 18 subway corporations, 14 locomotive depots, 8 EMU institutes, 9 car depots, 10 main engine plants/overhaul plants, 6 road bureaus, 8 local railway users, 16 track maintenance inspection institutes (machinery division), 22 track maintenance divisions and 37 power supply sections. This survey covered 100% major product types and over 90% of our users. Based on customers' feedback and survey data analysis, the assessment indicators on the Company's general customer satisfaction index, product quality and service quality all scored above 88.

Customer satisfaction survey rates in the past two years



PART II TECHNOLOGICAL INNOVATION AND PRODUCT RESPONSIBILITY

3.2 Customer Loyalty

Customer loyalty was 97.2% for 2018, which was basically in line with than for 2017 (98.9%). The data of customer loyalty includes the proportions of customers who are using our Company's products with pleasure and those who are willing to continue using our Company's products.

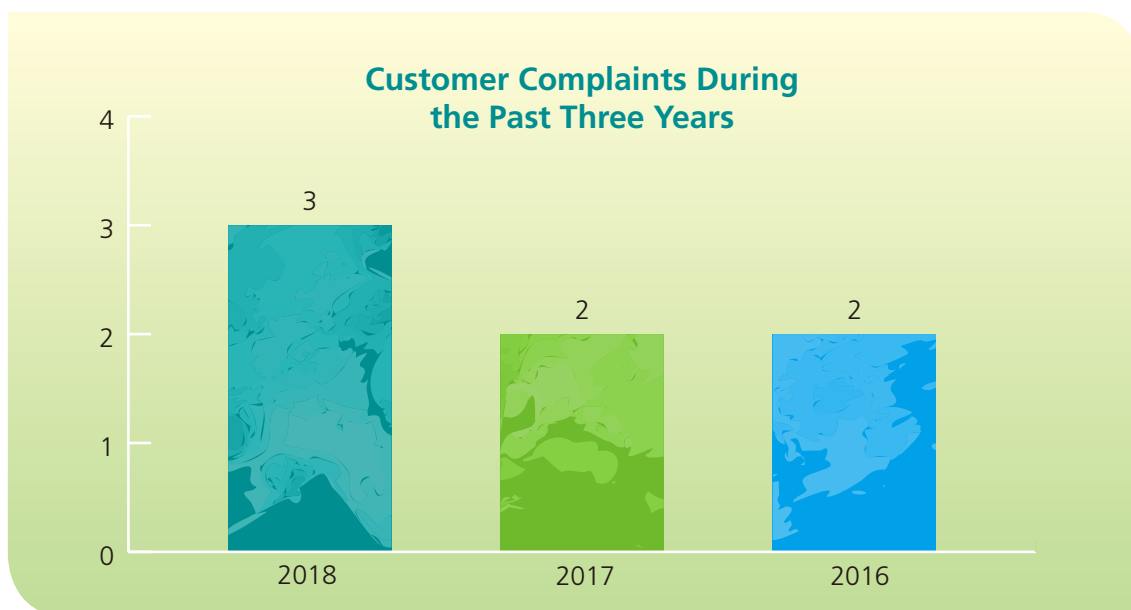


PART II TECHNOLOGICAL INNOVATION AND PRODUCT RESPONSIBILITY



3.3 Customer Complaints

The Company attaches great importance to the settlement of customers' complaints and establishes a customers' complaint settlement team led by the quality management department. This team gives fast response to each customer complaint, timely understands customers' demand, conducts in-depth investigation of and analysis on problems, puts forth effective solutions and improvement methods, eliminates problems from the system operation, and replies to customers in a timely manner to ensure their satisfaction.



4. Product Safety

As a large-scale rail transit equipment manufacturing enterprise integrating research and development, production, distribution and sales and a core supplier of components for railway locomotive vehicles, the Company's products are widely used in high-speed trains, and the safety and reliability of its products are therefore directly related to the lives and safety of millions of passengers. Product quality equals to safety, and safety is the life assurance of millions of passengers, which is also the golden rule for enterprise's survival. The Company has always regarded product safety as the core of its product quality work. Based on the technology security policy of **"Complying with railway safety standards to establish product safety concept; Understanding product safety effectiveness to improve safety rules and norms; Producing safe and reliable products to ensure train traffic safety"**, the Company implements strict control measures on various aspects including marketing, design, procurement, production, delivery and after-sales, and resolutely puts an end to product quality and safety problems.

4.1 Guarantee of Product Safety (Reliability)

☆**Continuous commencement of overseas RAMS projects.** Based on RAMS analysis, the Company ensured the RAMS capability of the products by incorporating reliability, availability, serviceability and safety analysts in the whole process of product development.

☆**Establishment of the product data traceability process system at the company level.** The Company completed the product data traceability process system at the company level, and achieved the integration with the main product systems, laying a solid foundation for acquiring the follow-up product life cycle information.

☆**Subway safety analysis.** The Company focused on the safety analysis of Hangzhou Metro and improved the product design on the basis of analysis conclusion to effectively improve product safety.

PART II TECHNOLOGICAL INNOVATION AND PRODUCT RESPONSIBILITY

4.2 Product Certification

In 2018, the Company has passed the CRCC certification for a total of 70 models of railway products under 16 categories in the five sectors of power supply, signal, passenger trains, locomotives and EMU:

No.	Sector	Types of Product	Model & Quantity	No. of Certificate	Issue Date	Issuing Agency
1	Power supply	Vehicle contact network operation status detection device (3C)	1	CRCC10217P10959R2L-27	2018/7/13	China Railway Test & Certification Centre
2	Signal	Train operation control system APT vehicle equipment hardware for CTSC-2	1	CRCC10217P10959R2L-21	2017/8/10	China Railway Test & Certification Centre
3		Train operation monitoring system hardware for LKJ-15	2	CRCC10217P10959R2L-26	2018/8/16	China Railway Test & Certification Centre
4		Train operation monitoring device hardware for LKJ2000	3	CRCC10217P10959R2L	2018/8/16	China Railway Test & Certification Centre
5	Passenger trains	Charger for passenger trains	2	CRCC10217P10959R2L-4	2017/11/16	China Railway Test & Certification Centre
6		Inversion power source for air conditioning of passenger trains	5	CRCC10217P10959R2L-5	2017/11/16	China Railway Test & Certification Centre
7		Charger for passenger trains (including single-phase inverter)	3	CRCC10217P10959R2L-25	2017/11/16	China Railway Test & Certification Centre
8	Locomotives	Network control system for AC locomotives	10	CRCC10217P10959R2L-22	2018/11/8	China Railway Test & Certification Centre
9		Central processing unit for AC locomotives	8	CRCC10217P10959R2L-23	2018/11/8	China Railway Test & Certification Centre
10		Locomotive automatic video monitoring and recording subsystem	1	CRCC10218P10959R2L-9	2018/1/4	China Railway Test & Certification Centre
11		Train power supply monitoring subsystem	2	CRCC10218P10959R2L-10	2018/1/4	China Railway Test & Certification Centre
12		DC600V power supply unit	7	CRCC10218P10959R2L-3	2018/8/23	China Railway Test & Certification Centre
13		Locomotive traction variable current power module	21	CRCC10218P10959R2L-6	2018/8/16	China Railway Test & Certification Centre
14	EMU	EMU network control system	2	CRCC10218P10959R2L-15	2018/9/28	China Railway Test & Certification Centre
15		EMU high frequency conversion charger	1	CRCC10218P10959R2L-26	2018/2/1	China Railway Test & Certification Centre
16		EMU shaft temperature alarm system	1	CRCC10218P10959R2L-19	2018/2/1	China Railway Test & Certification Centre
Total			70			

PART II TECHNOLOGICAL INNOVATION AND PRODUCT RESPONSIBILITY



4.3 Improved Test and Verification System

☆ Approval and Authorization

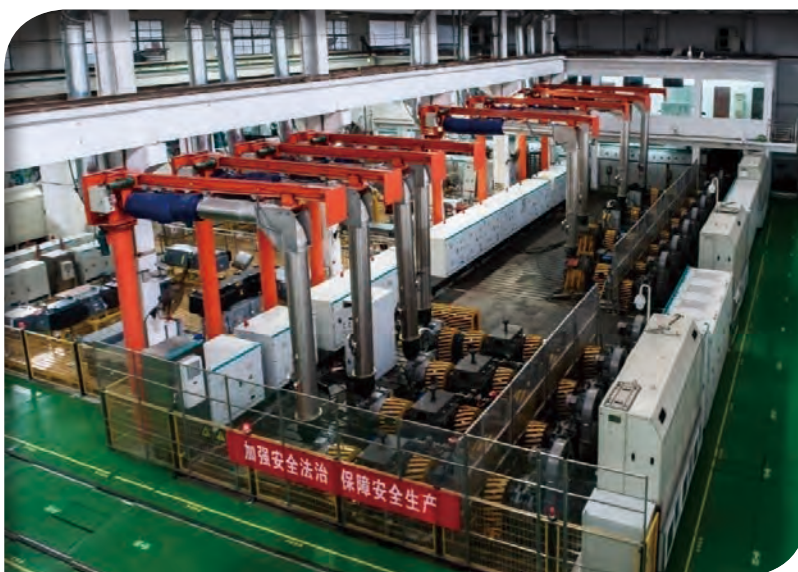
The Company invested in and constructed labs with relevant qualifications, which are currently used as:

- Laboratory for China Metrology Accreditation (CMA)
- Accredited lab of China National Accreditation Service for Conformity Assessment (CNAS)
- Collaborative lab for China Railway Test & Certification Centre (CRCC)
- Traction and Control of EMU and Locomotive of National Key Lab

☆ Inspection and Testing Capability

Traction system laboratory

The traction system laboratory is capable of conducting all testing and research of portfolio system based on the latest requirements, such as the IEC61377 family of standards. The temperature rise test of route distribution network, energy consumption test of route distribution network, traction and drive conversion test, anti-skid test as required by the latest standards and regulations are available to meet the national whole vehicle testing requirements of converter, traction motor and control system applied in high-speed EMUs, urban railway trains, electric locomotives, diesel locomotives, industrial transmission and other fields.



PART II TECHNOLOGICAL INNOVATION AND PRODUCT RESPONSIBILITY

☆ *Environment and sustainability laboratory*

(1) *Climate and environment testing capacity*

The climate and environment testing system is capable of conducting thermal, thermal change and thermal shock test, steady state damp heat test, alternating temperature and humidity test, icing test, salt spray test, dust and water resistant test (IP68 and below), operational condition, insulation and dielectric voltage withstand test and temperature rise test of electric and electronic products based on national standards and IEC standards, and the full power test for 150 kW inverters with a weight of 6,000 kg at high and low temperature.

(2) *Testing capability in mechanical environment*



The mechanical environment testing system meets the requirements of vibration and shock testing of electric traction system and equipment, network control system and equipment, and other products for locomotives. It is also capable of conducting vibration test and data analysis for onsite operation. It has comprehensive portfolio of environment and sustainability testing of parts and leading testing capability in the industry.

PART II TECHNOLOGICAL INNOVATION AND PRODUCT RESPONSIBILITY



☆ *Electromagnetic compatibility laboratory*

Electromagnetic compatibility laboratory is capable of conducting tests on strength of magnetic field, electromagnetic radiation, disturbance voltage at power supply end and disturbance current. The testing frequency of the EMI testing system is 18 GHz, while that of the EMS testing system is 8GHz. It is capable of conducting radio-frequency and electromagnetic field radiated immunity test at 30 V/m, which covers the 4G and 5.8G fields and outperforms industry peers. In particular, the 10m semi-anechoic chamber met the anechoic testing requirements for major equipment such as inverters and air conditioners for locomotives.



☆ *Network and wireless laboratory*

The network and wireless laboratory has formed the leading network consistency testing system, wireless communication testing system and point responder testing system in the PRC. It is capable of conducting consistency test of route network communication products for urban transit, locomotives and EMUs, radio conformance test of on-board WiFi and GSM/GPRS/GSM-R/WCDMA wireless communication equipment, and dynamic simulation test of wireless communication equipment to ensure transmission quality of train-ground communication and reliability of on-board network communication.



PART III ENVIRONMENTAL PROTECTION

I. ENVIRONMENTAL PROTECTION POLICY

We pursue the policy of human-concern, continuous improvement, environmental protection, health and safety.

II. DATA ON ENVIRONMENTAL PROTECTION PERFORMANCE MANAGEMENT

1. Discharge of Industrial Solid Waste and Hazardous Waste

Our Company sorts, collects and stores solid wastes in the same manner as general industrial solid wastes and hazardous wastes. Our Company will put priority to the recycling of the general industrial solid wastes, whereas unrecyclable wastes will be sent to qualified units for hazard-free disposal and hazardous wastes will be sent to the relevant units responsible for hazardous waste treatment for disposal. Our Company strictly follows the relevant national laws, regulations and policies in the process of hazardous waste treatment. Hazardous waste transfer sheet will be completed and reported to Zhuzhou Environmental Protection Bureau for record upon transfer. During 2018, the Company generated a total of approximately 276 tons of hazardous. A qualified treatment rate of 100% was achieved.

2. Discharge or Emission of Waste Water and Exhaust Gas in Compliance with Required Standards

Year	Volume of wastewater discharge (ten thousand tons)	Volume of wastewater treatment (ten thousand tons)	Compliance rate of discharge
2014	41	41	100%
2015	36	36	100%
2016	16	16	100%
2017	25	25	100%
2018	22	22	100%

In 2018, the Company strictly followed the relevant regulations and standards to manage sewage treatment and exhaust gas treatment facilities. All pollutant discharge data, as supervised and monitored under the entrustment of the Company and by monitoring authorities and government environmental protection administration, conformed to the emission standards. A compliance rate of 100% was achieved.

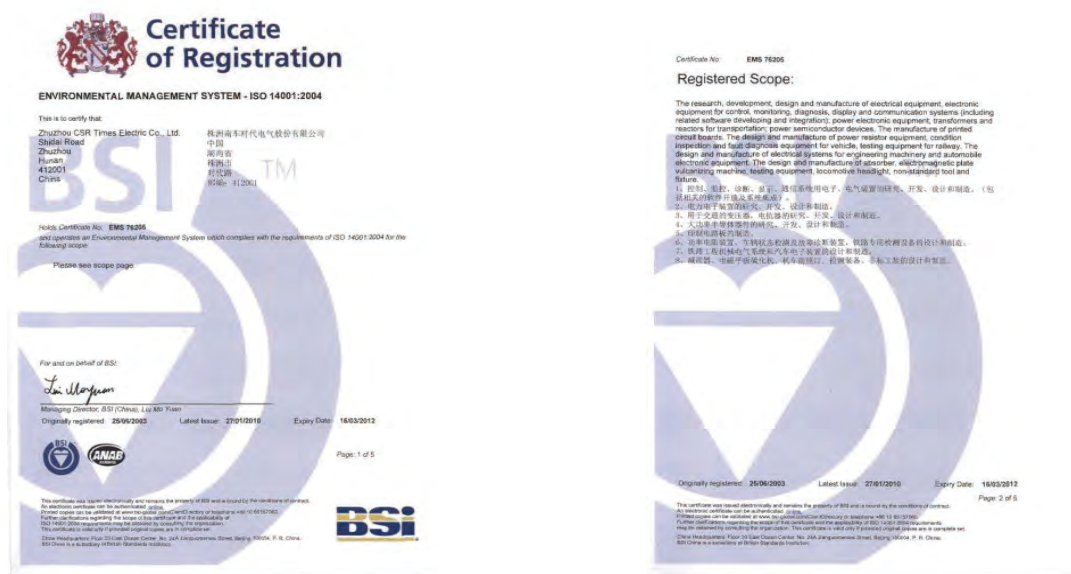
In 2018, the industrial wastewater discharge, emission of industrial exhaust, chemical oxygen demand and ammonia nitrogen emission of the Company amounted to approximately 220,000 tons, approximately 2.3 billion cubic meters, approximately 6 tons and approximately 1 ton for the year.

PART III ENVIRONMENTAL PROTECTION

III. ENVIRONMENTAL MANAGEMENT

1. Environmental Management System and Certification

The Company obtained the certification of ISO14001 environmental management system as early as in 2006. Through the process control under the environmental management system such as performance monitoring, internal audit, supervision, check, management review, the operational performance of the Company's environmental management system has improved continuously. In November 2017, the Company passed the upgrade review of British Standards Institution (BSI) for its ISO14001:2015 environmental management system certification. In November 2018, the Company passed the external audit of British Standards Institution (BSI) for its ISO14001:2015 environmental management system.



ISO14001 Environmental Management System Certificate

2. Environmental Protection Products

In the process of production, the Company always advocates the “Green” concept of CRRC’s core brand value and vigorously promotes the use of environmentally-friendly materials and environmentally-friendly technologies so as to create environmentally-friendly green products for the society.

IV. DESCRIPTION OF ENVIRONMENTAL COMPLIANCE

Prior to project construction, the Company actively carried out environmental impact assessment of construction work so as to ensure that the environmental protection facilities and construction projects will be designed, constructed and put into operation at the same time.

During the process of production and operation management, the Company has complied with the relevant national, provincial and municipal environmental protection laws, regulations and statutes, and that of the Ministry of Environmental Protection, and timely obtained, updated and conveyed the relevant environmental protection regulations and standards. The Company conducted its day-to-day internal environmental protection management based on these new regulations and standards. Meanwhile, the Company actively fulfilled its corporate environmental protection obligations and implemented the principles and policies of national energy saving and emission reduction. There was no punishment imposed by the relevant departments due to any violation of environmental regulations.

PART III ENVIRONMENTAL PROTECTION

V. ENERGY SAVING, CONSUMPTION REDUCTION AND COMPREHENSIVE GOVERNANCE

1. Energy Saving and Consumption Reduction

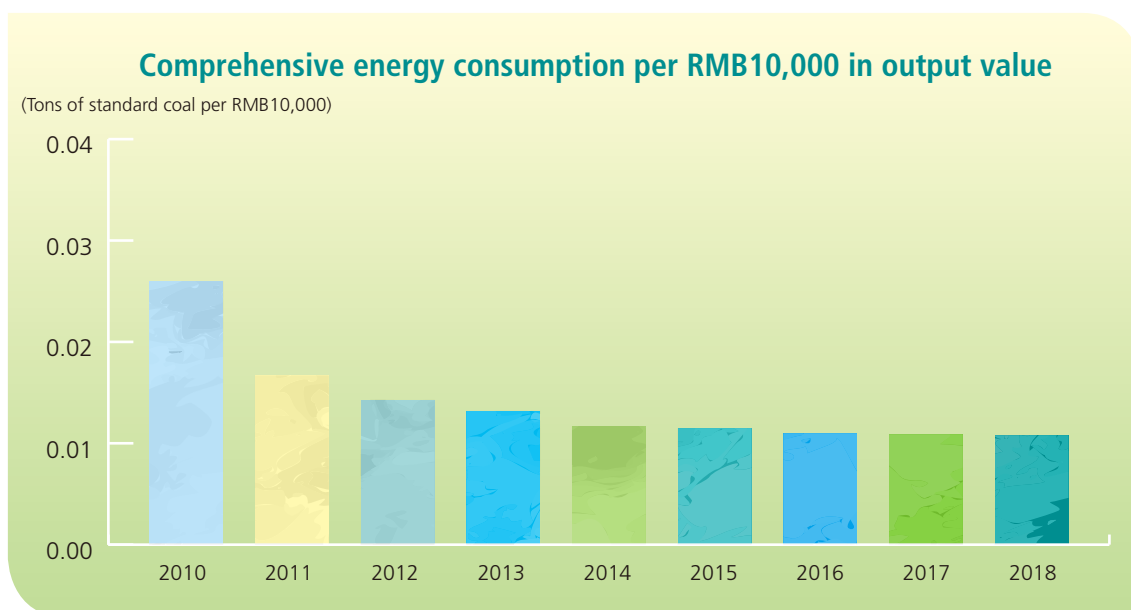
The Company will closely focus on its annual work objectives, comprehensively implement its strategic requirements, and start from the optimization of all energy management system and continuously improve the energy management system and off-site coverage. It will strengthen evaluation and inspection criteria, continuously enhance energy management level and team building, and promote energy saving to boost energy efficiency, fulfilling social responsibility obligations, and enhancing corporate value creativity.

1.1 Strict control of energy objective and indicators

The Company's energy indicator for 2018: comprehensive energy consumption per RMB10,000 in output value <0.0115 tons of standard coal per RMB10,000.

Actual annual energy consumption: power consumption: 90,900,000 kWh; natural gas consumption: 4.33 million cubic metres; water consumption: 1.46 million tons, the comprehensive water consumption per output of RMB10,000 was 0.94tons/RMB10,000.

Actual comprehensive energy consumption per RMB10,000 in output value: 0.0108 tons of standard coal per RMB10,000, lying completely within the controllable range.



PART III ENVIRONMENTAL PROTECTION



1.2 Full upgrade of energy management

(1) Gradual improvement of energy management informatization

The Company adopted online power consumption monitoring and data collection for the power distribution system at headquarters, which avoided manual mistakes and ensured measurement and statistical accuracy. In the first half of the year, a comprehensive inventory of the water supply network of the Company's headquarters and Tianxin Industrial Park was carried out. 4 water leaks in the industrial park and 1 water leak of the Company's headquarters were verified. In addition, through such verification, the drawing of the pipe network diagram of the headquarters and Tianxin Industrial Park Company was basically completed, and the transformation of wireless transmission of metering with water meters was completed.

(2) Training on energy management system

Due to changes in some divisions, the Company specially conducted on-site training for the above units twice. In April, a total of 23 employees from different business units (including overseas companies) completed the training program for energy management system and passed the examination of internal auditor. This provided the team building foundation for developing a comprehensive energy management system.

(3) Rationalization of energy management process

The Company optimized integrated corporate management and rationalized the internal audit documents and energy audit documents of the energy management system, and completed the identification and rationalization of new laws and regulations.

1.3 Strengthening construction of energy management system of companies outside of headquarters

After completing the standardization and systemization of the energy management of the Company's headquarters, with the aim of comprehensively improving the overall energy management level of the Company, the energy management system promotion work has also incorporated the overseas subsidiaries of the Baoji Times into the supporting and system certification unit of the energy management system business. The energy management of Baoji Times changed from passive management to active management and control. Its comprehensive energy consumption per RMB10,000 in output value in 2018 decreased by 9.2%, and Ningbo Times lowered the cost and boosted the efficiency to save basic tariff of RMB500,000. Through the continuous innovation of energy management, the comprehensive energy consumption per RMB10,000 in output value of the Company was controlled within 0.0115 tons of standard coal per RMB10,000, which has made a due contribution to energy saving and emission reduction.



PART III ENVIRONMENTAL PROTECTION

1.4 Continuous optimization and improvement of energy saving

- (1) The Company incorporates energy saving standards and requirements in research and design, and highlights environmental friendliness and energy saving in product design. The Company has always prioritized green and environment-friendly design and adopted energy saving design in the course of operation. For example, it calculated energy commotion of trains for system and project design. It also set out environmental protection and energy saving standards in the technical specifications manual. Besides, it launched a large batch of energy saving and green products in the market. For instance, it reduced the weight, size and energy consumption of each inverter by 15.5%, 26% and 30% for China's standard electric multiple units. China's first DC750V permanent magnet traction train, which was an energy saving and green model, has completed the on-site test. During the trial operation on the No. 8 line of the Beijing Subway, the measured energy consumption was reduced by over 15%. Leveraging its outstanding technology, the train lowered whole vehicle noise by 3dB. Energy saving requirements are included in the product technical design standards and requirements as design standards and requirements. Baoji Times has included energy-saving requirements as part of the design specifications in the technical design specifications.
- (2) The Company incorporates energy saving technology transformation in production and quota management of major energy consuming equipment. Through the implementation of quota management, the Company controls energy consumption and achieves the effective economic operation of equipment and production, continuously improving the performance of key energy-consuming equipment performance management. Baoji Times optimized control means and measures by determining major energy use in each production and operation process. The Company carries out refined management of diesel for the engineering vehicles that leave the depot for commissioning, and enhances guidance and investment to save energy with technology. For example, it replaced oven with induction heating equipment to shorten heating time and boost efficiency by four times. The purchase of cranes and other light lifting equipment to replace crown block reduced the use and frequency of crown block. The construction of production lines not only improved working environment and advanced automation, but also saved human resources significantly.
- (3) The Company has completed the frequency conversion and intelligent optimization of the ZNERCC air conditioning unit, saving RMB300,000 in tariff every year.
- (4) The Semiconductor Business Division has implemented the recycling of concentrated water in the purified water system, saving 80,000 tons of water and 65,000 kWh of electricity every year.
- (5) Ningbo Times has improved the structure of the power distribution system and reduced the basic tariff by RMB1 million.

1.5 Vigorous promotion of energy saving

In 2018, in order to raise energy saving awareness, the Company has attached great importance to diversity of promotion initiatives and strived to create an atmosphere that encouraged energy saving and emission reduction, which facilitated the transformation from "passivity" to "self-awareness". Based on the requirements and plans for energy saving and emission reduction, we held the "2018 Energy Saving and Consumption Reduction" campaign. It enhanced energy saving awareness among staff and educated employees on energy saving knowledge by putting up promotional posters and promoting "energy saving tips", "benefits of energy saving" and "saving energy at office by starting with small actions". As a result, the Company created an atmosphere where energy saving was incorporated in all aspects of all operations by all staff.

PART III ENVIRONMENTAL PROTECTION



2. Social Management and Comprehensive Governance

In 2018, the Company's social security comprehensive governance work closely focused on its overall objectives of scientific research, operation, production and management. It was problem-oriented, closely following the social security comprehensive governance organizations, rules and regulations, and functional responsibilities. The Company continuously promoted the construction of a multi-level comprehensive governance system with hierarchical grading, and comprehensively reached the "Annual Responsibility Target for Comprehensive Governance" to achieve the "four nos" work objective of "no fire, no accident, no case, and no damage". Such objective of comprehensive governance and safety management work has laid a solid foundation for organizational security, personnel security, system security, emergency support, and financial support.

2.1 Optimization of organizational structure and clear definition of job responsibilities

- (1) Based on the requirements of reform of working organizations and the adjustment of leadership, we completed the establishment of organization for comprehensive governance of social security of the Company in a timely manner and issued relevant adjustment documents. We also organized different departments to sign on the Annual Statement of Comprehensive Governance Responsibility. Based on the actual condition of comprehensive governance in different departments, we completed the preparation of Annual Target and Working Plan for Comprehensive Governance and the Working Record of Internal Security and other fundamental tasks. Over 30 first class statements of responsibility and hundreds of second class (workshops and teams) were signed, which achieved total coverage and all-staff participation of comprehensive governance and target management.
- (2) We continued to improve the working mechanism to ensure the implementation of tasks of comprehensive governance of safety. By relying on the social security comprehensive governance working committee of the Company and with the target of centralized management by specialized departments, we continued to improve the mechanisms of comprehensive governance committee, fire safety work leading group and other organizations of comprehensive governance of security, which laid a foundation for fully achieving the annual target of comprehensive governance.
- (3) We further improved relevant rules and regulations, which provided legal guidelines and basis for facilitating the comprehensive governance and management works. Based on the requirements of actual and functional adjustment of the Company, we completed the revision and issuance of statements of responsibility for fire safety, transportation, comprehensive governance and annual target of comprehensive governance and management, appraisal rules and other relevant rules and regulations.
- (4) In order to develop the culture of working by rules, we took the procedures and systems as the basis and guidelines for business operation, strengthened the execution ability of all staff and continued to enhance the overall operation efficiency and internal management ability of the Company. In particular, we competed and issued the Administrative Measures for Social Security Comprehensive Governance and the training material and test quiz for "Must Know" positions and "Shall Know" personnel in the working procedures.



PART III ENVIRONMENTAL PROTECTION

- (5) Based on the principles and actual situation of internal safety and security protection of the Company, and in order to strengthen and implement safety management and control of personnel, material supply and vehicles, ensure the safety and stability of the Company's scientific research, production, office order and the industrial park, with the approval from the responsible leader of the Company, we made adjustment and reform on the existing security management and control model of the Tianxin Industrial Park and the headquarter of the Company by leveraging on the internet informatization and focusing on the target of "Double Effects" based on the building layout of the Tianxin Industrial Park and the headquarter of the Company, the requirements of organizational adjustment of the Company and the nature of security works. In particular, we constructed a new reception room for visitors of the industrial park, installed the systems for smart identification of license plates, smart visitor registration and access control with total investment of RMB1.21 million, which ensured safety and fully facilitated the enhancement of working efficiency of the security management within the area.
- (6) We strictly implemented the Company's operation idea of "cost reduction, efficiency enhancement and refined management", fully facilitated the replacement of "manual monitoring and protection" security protection model with intelligent, informatized and internet management, in order to maximize the effect and efficiency. We also fully facilitated the adjustment and reform of internal security management and control model in Tianxin Industrial Park with intelligent and informatized measures, which ensured safety while eventually reducing 50% of the number of security personnel in the whole park, achieving outstanding results of management and control and economic benefits.
- (7) We strictly performed our guiding, serving and supporting functions, urged different departments to deeply implement comprehensive governance of security with administrative and appraisal measures, and created a good safety management situation of facilitating implementation with system, controlling and managing procedures with responsibility and examining results with appraisal.
- (8) With the detailed preliminary deployment and strict implementation, we completed the on-site security protection of the Company's Chinese New Year Gala and the Opening Ceremony of Zhuzhou Smart Rail A1 Line, and provided guidance to the subordinated departments to ensure the safety and smooth operation of annual summary, art show and other large group activities.
- (9) Based on the working principle of "combining prevention and management and control", we fully strengthened the responsible awareness in protective areas, and strictly implemented the shift work system. With the concerted efforts of all security personnel, we successfully completed the tasks of "Chinese New Year", "Labour Day" and "Dragon Boat Festival", which laid a foundation for the internal security protection and control during holidays.
- (10) We strengthened the supervisory management of security personnel, and continued to enhance the skills and abilities of security personnel and management personnel through different platforms and channels. Meanwhile, we also linked the daily task appraisal management with the monthly subcontracting charge for security business, and implemented and supervised the daily management based on the reward and punishment appraisal system, which created a safety management situation of "improvement through joint management" and "simultaneous implementation of reward and appraisal".

PART III ENVIRONMENTAL PROTECTION



2.2 Further strengthening fire prevention management and promoting full participation of “fire safety”

With the aim of further developing comprehensive governance and safety management, the Company targeted the weakest links in management, key parts and entry-exit management of personnel and items. It stays committed to the guiding concepts of “person-in-charge shall be responsible” in comprehensive governance, adheres to the operating principles of “local management, integration of vertical and horizontal administration with a focus on horizontal authority”, and upholds the operating principles of “stratified management, differentiated responsibility, integration of vertical and horizontal administration, combination of point and plane, joint efforts of upper and lower levels, full team participation”. It pushed forward the education on public order and comprehensive governance, which mainly focused on the Fire Safety Law, National Security Law, Regulation on Internal Security and Safeguard for Enterprises and Public Institutions, Order 93 of the Security Bureau, relevant requirements of CRRC and other laws and regulations. The Company ensured safety and stability within the organization by enhancing staff’s legal awareness about comprehensive governance.

- (1) To strengthen the fire safety of the Company, implement accountability system and effectively prevent major fire accidents, especially those causing massive death and injury, based on the working principles of “one position for two responsibilities, same responsibility for Party organization and administrative departments and holding accountable of responsible personnel” and “self safety inspection, self defect rectification and self performance of responsibility”, different departments signed on the statement of management target and responsibility of comprehensive governance, and the Company signed the statement of responsibility and letter of undertaking for corporate fire safety works with local fire departments to implement the accountability system of fire safety.
- (2) To examine whether the building fire safety facilities and equipments meet relevant standards and required specifications, and ensure the effective functioning of the building fire safety facilities of the Company, the Company engaged third party fire safety inspection company to conduct inspection on building fire safety facilities. The inspection results met relevant regulatory requirements and the system was running effectively.
- (3) To further strengthen the fire safety management of the Company, we tackled the prominent problems and weakness which affected the stability in fire prevention and control of the Company. In particular, we gathered information on acceptance inspection on building fire safety facilities, installation of fire safety facilities and equipments, construction of micro fire station, enhancement of standard of fire control room and fire emergency response management, and reported to the department at higher level in this regard.
- (4) Based on the requirements set out in the instructive documents from the fire departments at provincial and municipal levels, we continuously provided trainings on emergency skills to members of “micro fire station”, which laid a foundation for the early rescue, small-size extinguishment, three-minute in position as well as interactive emergency response for early stage fire accidents.
- (5) We continued to implement the building fire safety equipment maintenance system. Instead of the previous model of selected suppliers, we determined the suppliers through comprehensive assessment in terms of pricing, discount and after-sale services offered by suppliers. For public area in the headquarter of the Company, we have replaced and repaired 1,270 fire extinguishers, replace over 150 emergency lamps and 20 aged fire hoses, which ensured the normal operation of fire safety facilities, equipments and systems.



PART III ENVIRONMENTAL PROTECTION

- (6) We actively carried out rectification of fire hazards. Firstly, we spent nearly RMB500,000 to engaged infrastructure department to rectify the problems of continuous drop of water level of water tank on the rooftop of the third line of the Company's factory, lack of water pressure for indoor fire hydrants and multiple leakage and wrong connection for outdoor fire hydrants, which ensured the water supply for fire safety. Secondly, we spent nearly RMB100,000 to replace the malfunctioned automatic fire alarm system of the Company's factory, which strengthened the fundamental safety.
- (7) To deeply implement the inspection and rectification of fire hazards of the Company, we further enhanced the rate of integrity of building fire safety facilities, eliminated the non-compliance in production and operation, improved the self prevention and rescue ability of different departments, and prevented and reduced the occurrence of fire accidents. We identified over 130 problems and defects in the inspections throughout the year, and communicated the results of inspections to provide basis of hazard reporting and data for appraisal. We also made followed up actions to urge the responsible departments to make timely improvement and rectification, thereby eliminating safety hazards.
- (8) With the target of improving the Company's "ability in fire safety training and education", we increased our promotion efforts to enhance the safety awareness among our staff. We also made PPT training materials on fire safety laws and regulations, fire safety management, fire safety basic knowledge and emergency response management and presented such material on the OA network and television wall, thereby promoting the idea of full participation and undertaking of responsibility by all staff in respect of the fire safety work of the Company.

2.3 Strengthening road safety control and management and continuously maintaining and regulating daily management of road safety

- (1) In view of the traffic congestion and frequent traffic accidents in the surrounding roads of the Company and the significant number of staff and vehicles of the Company, to ensure the road safety and order, we carefully selected and trained eight staff with great sense of responsibility and business skills to form the Road Traffic Coordination Team with the support and guidance from the local competent authorities, which solved the long standing problems of traffic congestion and high risk, and alleviated the pressure of responsible officers from local traffic administration during the period of major tasks, thereby ensuring road safety.
- (2) We continued to improve the management of staff commuter buses, strengthen qualification management by selecting qualified bus operators to provide commuter bus management services, thereby minimizing the risk of management responsibility. Meanwhile, we conducted inspection on commuter buses at least once a month to prevent the use of malfunctioned vehicles, ensure the quality and safety of each vehicle and prevent massive death and injury caused by traffic accidents. In addition, we made timely adjustment to the routes of commuter buses based on the needs of staff to ensure the safety of staff during transportation to and from work. During the year, we operated 14 routes of commuter buses which travelled 5,995 times with 41,934 passengers and recorded zero traffic accident.

PART III ENVIRONMENTAL PROTECTION



2.4 Improving emergency response management system and effectively enhancing skills and capabilities of emergencies response

- (1) The Company organized and completed the further improvement of its emergency management organization and the update and revision of the overall emergency plan, unified coordination and promotion of the timely update and improvement of each affiliated special plan, ensuring that such plans are close to reality and practically improve scientificity, operability and rationality.
- (2) We reformulated the List of Organizations and Personnel for Emergency Response and the List of Experts in Different Aspects for Emergency Response to get close to the source of accident for emergency response. Meanwhile, we organized the security personnel in different security areas to carry out emergency drills on emergency response on management of access control, handling of area security incidents and anti-terrorism with an aim to further improve the refined management of emergency response plan and ensure the continuous implementation of emergency response management system.
- (3) We continued to strengthen the supervision, guidance and appraisal of security and emergency response team. With the target of “improving the individual skills of emergency response”, we increased our efforts in education and training, and further enhanced the awareness of safety, responsibility, service and emergency response among security and emergency response personnel, thereby continuously maintaining and enhancing the emergency response ability and emergency response management level of the Company.
- (4) Based on the Company’s current division of security protection areas, we established the interactive emergency response management system with focus on relevant areas and covering different security check points. In addition, we increased our investment in procurement of weapons and equipment for emergency response in order to safeguard the security and stability of the Company.

PART IV CARE FOR STAFF

I. OUR STAFF

Employee team is the most valuable asset of the Company and the foundation for corporate development. The Company will employ staff in strict compliance with the laws and will never harm their interests. By closely monitoring the interest of the staff and creating a good environment, the Company contributes to self-achievements and well development of the staff.

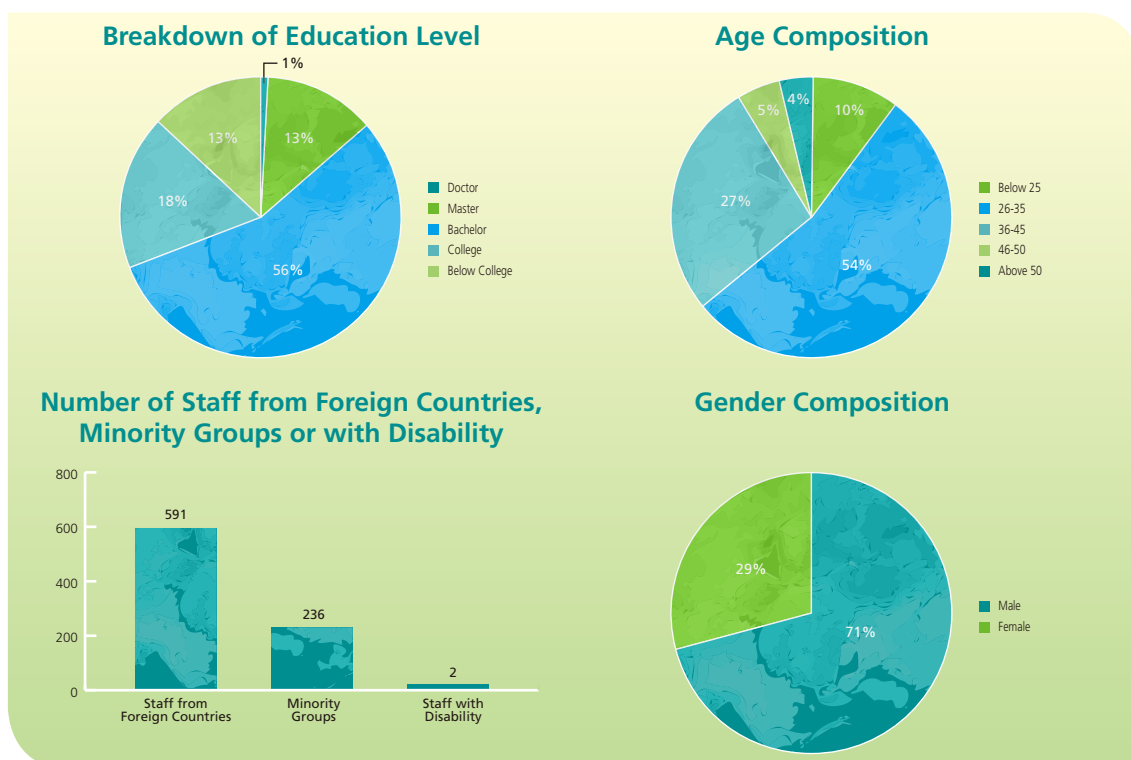
As of 31 December 2018, the Company has executed labor contracts with 7,905 employees in total

1. Employment Diversity

1.1 Current Employment Overview

The Company continues to strengthen the optimization and management of human resources and strives to establish a dynamic and competent team with high academic qualifications, young age, advanced techniques and strong professional skills. Currently, the Company has recruited a number of talents possessing core expertise, high-end technique as well as operation and management skills of the industry, which has laid a solid foundation for the Company's sustainable development.

The Company has a relatively stable workforce. Over the last three years, the employee turnover rate was maintained at below 5%, and was only 3% in 2018.

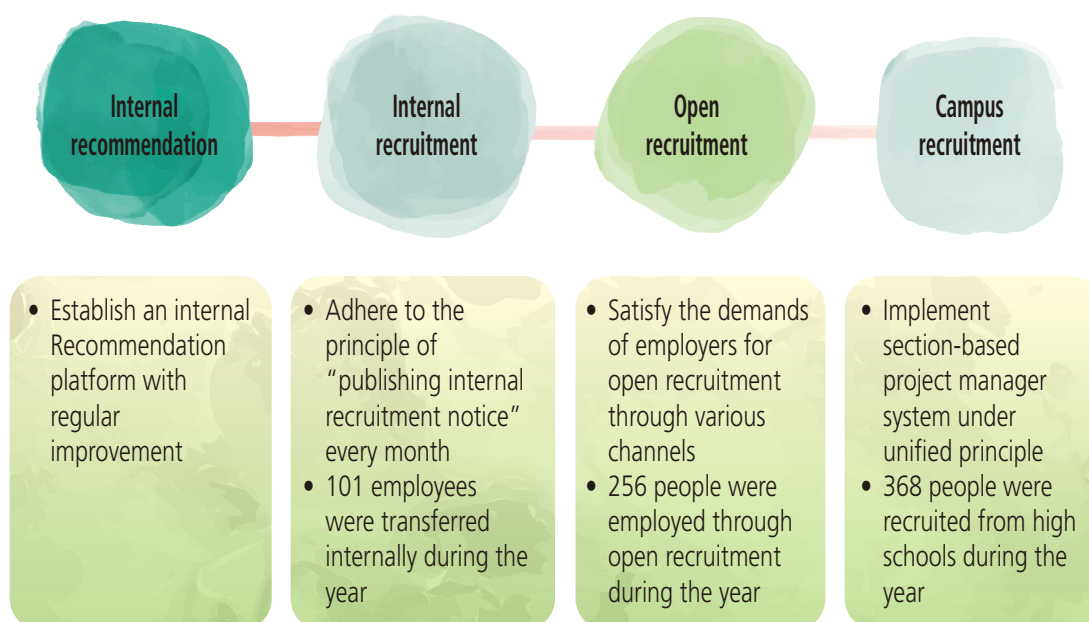


PART IV CARE FOR STAFF

1.2 Staff Recruitment

The Company maintained a sound staff recruitment process in accordance with the requirements under the Labor Law, the Employment Contract Law, the Law on the Protection of Minors, the Law on Protection of Rights and Interests of Women and the relevant laws and regulations, and strictly carried out reviews on the basic information of job applicants. The Company forbade the employment of child labour and forced labour, and adhered to the principle of equality between men and women. The Company does not discriminate against staff on nationality, race, age, gender and marital status.

The Company has established various recruitment channels based on different needs of talents for various positions, including internal recommendation, internal recruitment, open recruitment and campus recruitment. It also introduced innovative measures to conduct recruitment of talents in various aspects such as railway signalling, rail transport digitalization and intelligence, electric motor system for passenger trains, deep water equipment and environmental protection and overseas talents, which will provide the Company with talents supporting its major industrial development.



2. Staff Salary and Benefits

The Company provides remuneration and benefits in accordance with the requirements under national laws and regulations and relevant policies, maintains a comprehensive remuneration and welfare management system, and adheres to the principle of equal pay for equal work and legal remuneration.

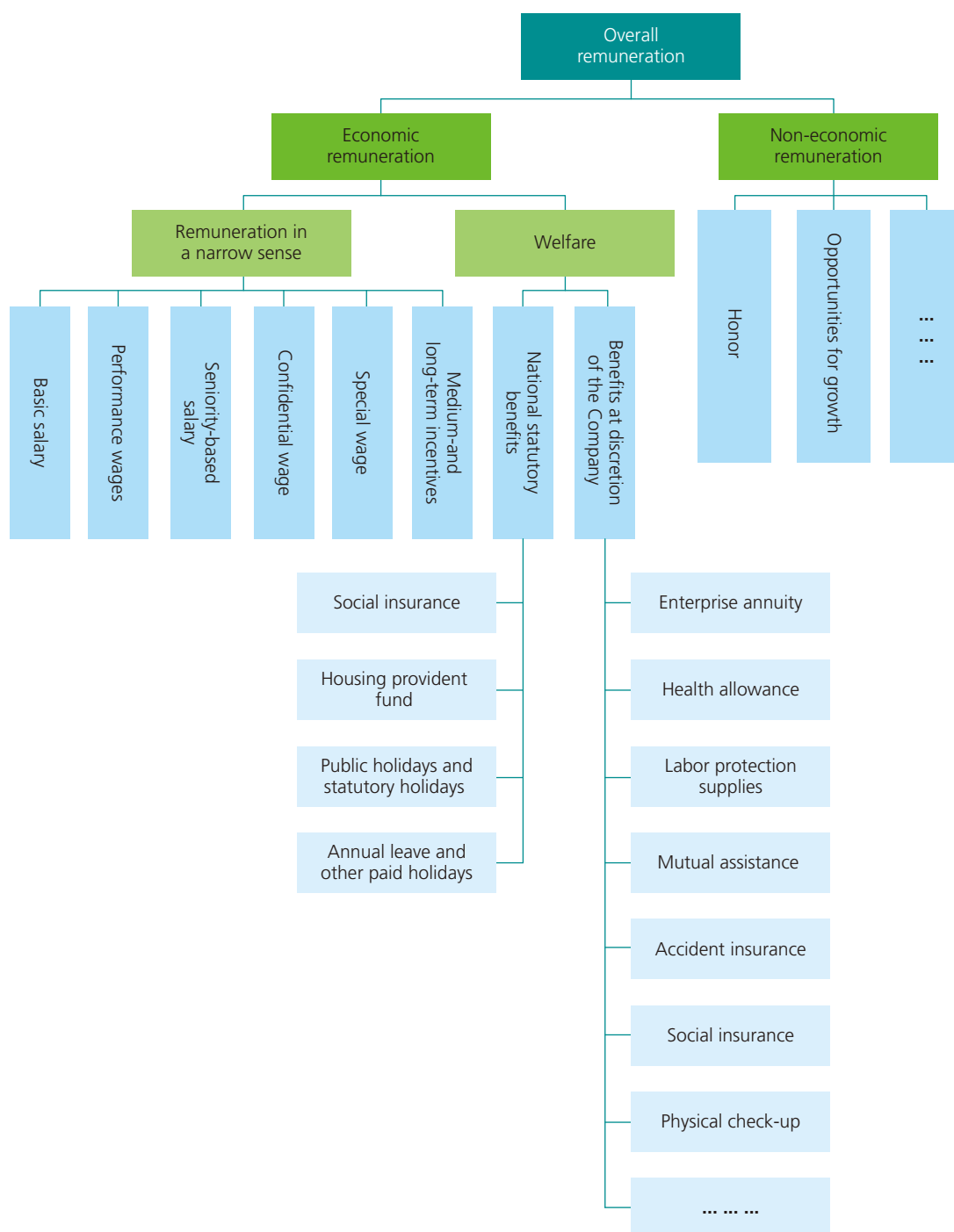
The Company adheres to the principle that puts efficiency as top priority while giving consideration to fairness and equality, and establishes a salary system which links salary with position, capability and performance.

In accordance with the requirements of national laws, regulations and related policies, the Company provides and maintains statutory benefits for its staff, including basic pension insurance, basic medical insurance (including medical insurance for serious illnesses), work injury insurance, maternity insurance, unemployment insurance and housing provident fund, etc. It also provides the staff with various benefits at discretion of the Company, including corporate annuities, supplemental medical insurance, lunch subsidies, health allowance, labour protection supplies, physical check-up, recuperation, transportation and communication subsidies, mutual assistance, accident insurance for family planning, etc.

PART IV CARE FOR STAFF

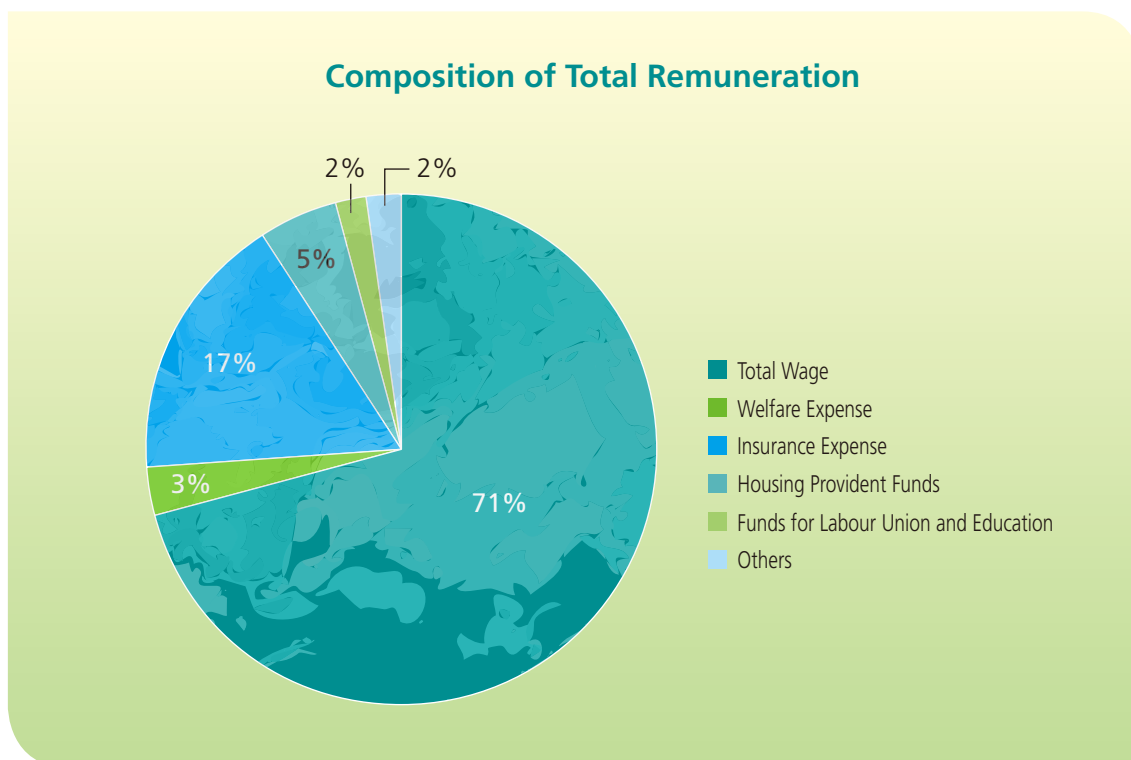
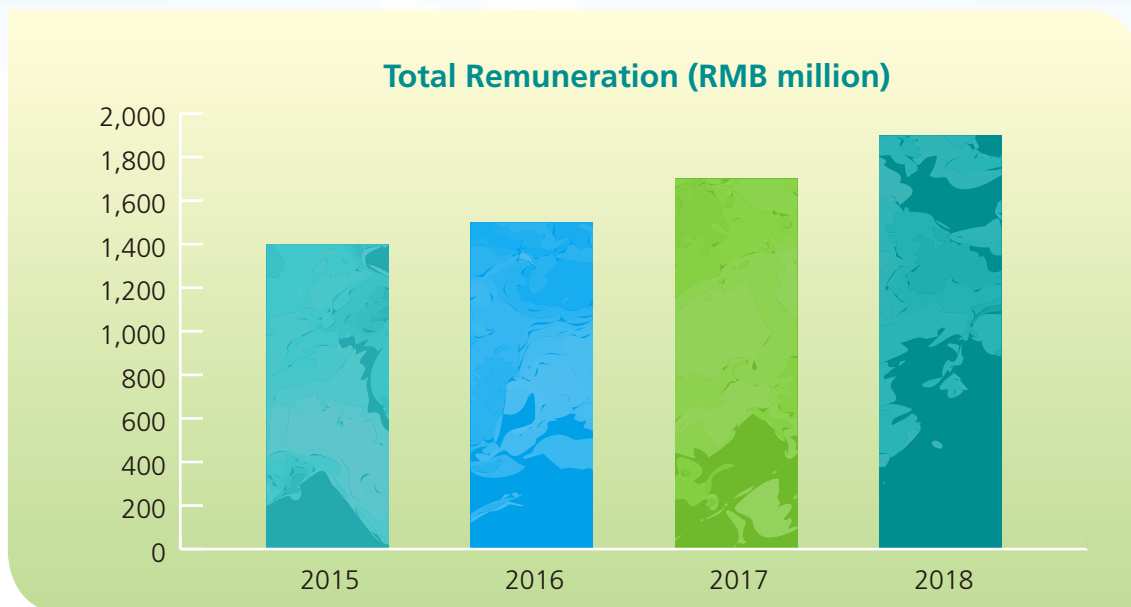
Staff is entitled to day-off on public holidays, wedding leave, funeral leave and maternity leave. In addition, they are entitled to annual leave according to national Regulations on Paid Annual Leave and Implementation Measures for Paid Annual Leave for Corporate Employees.

The Company promotes the concept of overall remuneration. It has extended the concept of remuneration to include welfare and other non-economic rewards such as honours, career development, etc. Accordingly, the staff can have a comprehensive understanding of the returns given by the Company, which enhances the incentive provided to them in the form of remuneration.



PART IV CARE FOR STAFF

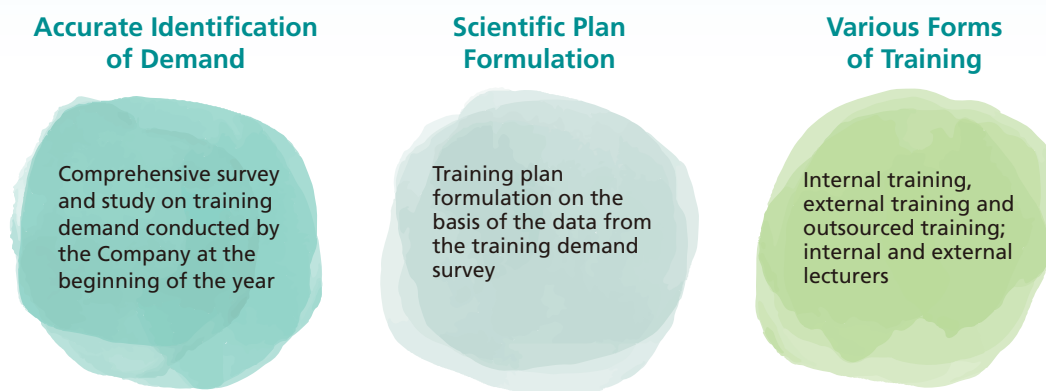
Growth and Composition of Total Remuneration (Wages and Surcharge) in 2018



PART IV CARE FOR STAFF

II. TRAINING AND DEVELOPMENT

1. Staff Training and Management



Based on the extensive training demand survey and study alongside with the analysis on various training needs of strategic development and department operations and employee's career development, the Human Resources Department of the Company actively allocates its resources and arranges training at different levels, in different forms and on different aspects by engaging internal and external lecturers.

The Human Resources Department persists in revising and updating training management and system development, and eliminating obsolete ones by enlarging efforts on monitoring and best practice benchmarking to ensure implementation of training projects at organizational level. Moreover, the Company encourages independent design based on three levels of learning, namely position, competence and career development and integrates resources of internal and external programs in order to help enhance motivation, ability and perseverance of its staff with objectives and directions.

In order to uphold the requirements of the Company's strategic human resource management, realize the common development of employees and organizations, and at the same time standardize and coordinate the training management within the Company, the Company optimised the training system by constructing the operation mode of the training centre in 2018. At the same time, the Company began to build its training brand and establish the brand image of the training centre among employees, customers and external companies.

Internal trainers are the teachers of corporate knowledge and skills, who play a critical role in talent cultivation. The Company attaches great importance to cultivation of internal trainers and has established a matured team of internal trainers comprising a total of 547 trainers classified into two levels (company level and business unit level). In particular, the Company has 31 five-star internal trainers, 92 four-star internal trainers and 160 three-star internal trainers. In addition, the Company also has 5 CRRC senior trainers. To facilitate sharing of internal experience and knowledge transfer, the Human Resources Department further promoted the platforms of "Happy Classroom" and "Expert Forum" to carry out internal training. Many of the staff members actively shared their experience and achievement on stage, which formed a "sharing and interactive environment". In 2018, the Company's internal training brand continued to innovate, and planned internal training courses such as vocational skills training, quality management special training, and lean management training series. The course evaluation was good. The Company held the first micro-course competition and exported 205 micro-courses covering professional literacy, general abilities, professional management, and operational skills. The smart learning platform was successfully launched, and the informationization of online learning, online exams, training resources and business management was implemented, which facilitated the evaluation and tracking of training results, and further standardized the training management process and improved the efficiency of training management.

PART IV CARE FOR STAFF



In 2018, the Company's total investment in training was approximately RMB12.56 million. The training time per capita was 48.5 hours and 2,177 training projects were completed. The implementation rate of the Company's annual training plan was 87.94%.

【Case sharing】

The Company established a core talent team to support its strategy. It planned and organized various training programs such as "Training for Excellent Leadership", "Training for Core Technical Talents", "Training for Management Talent Pool", "Training for International Talents", "Special Training for Marketing Personnel" and "Mobile Learning for the Strategic Implementation Series".

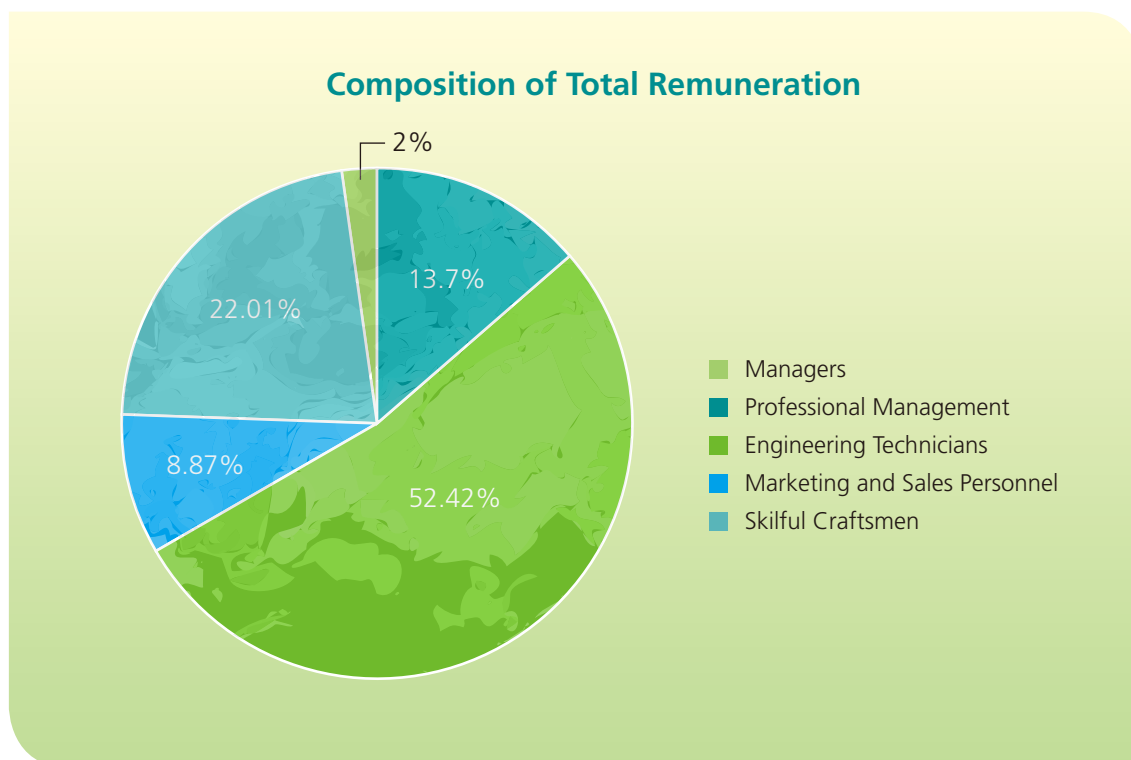
The Company actively arranged relevant personnel to participate in various special training programs organized by CRRC and CRRC ZELRI, such as "Training for Excellent Leadership (Japan)", "Training for Core Technical Talents (Germany)" and "Training for Core Management Talents (Japan)".

2. Staff's Career Development

The Company has developed a career development bridge system with 5 career development paths for managers, engineering technicians, professional management, marketing and sales personnel and skilful craftsmen. Every staff may realize his/her own career development through the planned career path of the job he/she engages. Currently, staff above C-level accounted for 36.24% of total number of staff.

Currently, the Company has a team of experts possessing core expertise of the industry, operation and management talents as well as core technological talents. The team includes 2 "scientists", 6 "chief technological experts", 31 "senior technological experts", 150 "technological experts", 1 "chief management expert", 5 "senior management experts", 38 "management experts", 1 "senior skilful expert" and 17 "skilful experts" of CRRC.

Composition of career development paths:



Note: The scope of statistics does not include DYNEX, and SMD.



PART IV CARE FOR STAFF

III. HEALTH AND SAFETY

1. Safety Objective and Target Management

The Company adheres to the occupational health and safety guidelines of “people-oriented, continuous improvement, environmental friendliness, and health and safety”. According to the safety management principles of “Responsibilities between the Party and Government, One Position with Dual Responsibility and Person in Charge Shall Be Responsible”, the Company has formulated, developed, established and published the annual implementation plan of major safety management tasks. It strictly implements accountability system for safe production. The Responsibility Commitments on Management of Safety Objectives are signed by all units to specify the safety responsibilities and break down the safety targets. The Company organized regular quarterly safety committee meeting to resolve any safety issues in a coordinated manner. In 2018, the Company did not experience any accidents involving deaths, serious and minor injuries, as well as new cases of occupational disease. There were also no Class I fire and explosion accidents, material and liable traffic accidents, and other accidents with material effects. The situation of safe production was generally good.

2. Overall planning and comprehensive layout for performance of production safety responsibility

The Company has released the implementation plan of the annual safety focus, annual safety inspection plan and overall planning of the year’s safety work, and has clarified the objectives, evaluation criteria, responsible subjects and schedules for annual safety work, working out an early plan and layout for the Company’s safe production.

The Company has implemented safety production responsibility at all levels. The general manager, party committee secretary and each business division (department) of the Company signed the “2018 Safety Management Objective Responsibility Letter”, analysed the indicators of the “2018 Safety Management Objective Responsibility Letter” signed by the Company and the Municipal Safety Supervision Bureau and Zhuzhou, and clarified the annual safety assessment indicators and key work assessment indicators for each division. The professional managers of each division have paid a security risk deposit of RMB900,000 to the Company.

The Company pays attention to safety investment. In 2018, the Company has actually invested RMB36.7073 million for the labour protection fee and safe production cost, which are used for employees’ labour protection and safety hazard rectification. The actual safety production cost withdrawn accounted for 0.2% of the operating income, and all safety measures were ensured in place in terms of funding.

The Company regularly organizes quarterly safety committee meetings to summarize the current safe production work, arrange the next stage of work, and study and solves problems in such work.

The overall work planning, the signing of the safety objective responsibility letter, the implementation of the safety risk deposit system, the safety investment and the safety committee meeting mechanism have formed a situation of “joint responsibility between party and government, one position bearing two kinds of responsibility, and joint control and management among various departments”, laying a solid foundation for the Company’s 2018 annual safety management objectives and indicators.

3. Conducting EHS system optimization to continuously improve environment and occupational health and safety management system

The Company requires each division to include new sources of risks and environmental factors in the new construction projects and four new technologies. In 2018, the Company identified 49 major sources of risks and 23 important environmental factors, clarified the positions, responsible units and responsible persons of major sources of risks, and further improved the monitoring measures to ensure that such major sources of risks were controllable and under control.

PART IV CARE FOR STAFF



In 2018, according to the new ISO14001-2015/GBT24001-2016 environmental management system standards, the Company organized EHS internal auditors to complete the revision of 37 system documents (including integration with business). All EHS documents were published on the EPROS platform and are available on the EHS platform of the Company's OA website.

The Company carried out the work of obtaining, identifying, evaluating and publicizing EHS laws and regulations. In 2018, the Company obtained the latest EHS laws and regulations from the country through the State Administration of Work Safety, the Ministry of Environmental Protection, the Municipal Safety Supervision Bureau, and the Municipal Environmental Protection Bureau. In 2018, a total of 7 new laws and regulations, 14 new standards, 9 updated laws and regulations, 1 updated law and regulation, and 1 abolished management measure were obtained. Through monthly safety meetings and quarterly safety committees, the Company conducted publicity on newly obtained laws and regulations and carried out compliance evaluations to ensure that the Company's production operations comply with relevant national laws and regulations.

The Company continues to improve the on-site operation environment. In combination with the operation of the system, the Company organized the manufacturing centre, the semi-conductor business division, the inspection and testing centre and other departments to formulate the "2018 EHS Management System Objectives, Indicators and Management Plan", and strived to improve the working environment of employees and continuously improved the performance of the EHS system.

Option 1: 2018 EHS Objectives, Indicators and Management Plan of the Manufacturing Centre

Name of the plan	Targets/indicators	Environmental factors/sources of risks	Management plans
Improvement in safety management of factory machine rooms	Reduction of the risk of object strikes and precaution against the risk of gas leakage	Strike damage caused by maintenance of objects and fire and explosion led by gas leakage	<ul style="list-style-type: none"> ① Creation of water pump repair work tooling ② Linkage between gas leak alarm system and exhaust fan ③ Installation of surveillance cameras in machine room to correspond with building monitoring (BA)



Alternation: key monitoring of key equipment operations.



Application: interior of machine room after alternation.

PART IV CARE FOR STAFF

Option 2: 2018 EHS Objectives, Indicators and Management Plan of the Manufacturing Centre

Name of the plan	Targets/indicators	Environmental factors/sources of risks	Management plans
Improvement in safety management of high voltage test area	Control of the number of operational accidents to zero	Electric shock injury	① Removal of the plant lighting control system in the test area ② Installation of surveillance of behaviour and equipment for new locomotive test benches ③ Installation of shielded partitions for new locomotive test benches



Alternation: implementation of separation of operating area from test area.

Option 3: 2018 EHS Objectives, Indicators and Management Plan of Semi-conductors

Name of the plan	Targets/indicators	Environmental factors/sources of risks	Management plans
Improvement of implementation of leakage prevention at wastewater stations	Zero leakage and environmental pollution incidents	Environmental pollution	① Addition of anti-leakage devices around the aerated biofilter vertical tank ② Addition of anti-leakage devices under the acid and alkali filling port



Alternation: anti-leakage devices around the aerated biofilter vertical tank.



Application: anti-leakage devices under the acid and alkali filling port.

PART IV CARE FOR STAFF

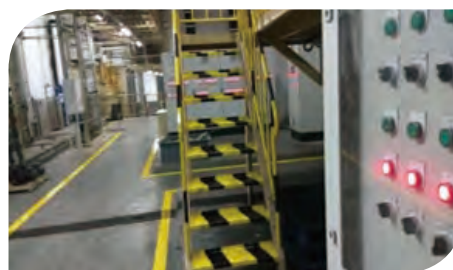


Option 4: 2018 EHS Objectives, Indicators and Management Plan of Semi-conductors

Name of the plan	Targets/indicators	Environmental factors/sources of risks	Management plans
Safety improvement of ladder facilities	Improvement of safety fences and warning signs for all high platforms	Fall of person from height	① Addition of cage protection for straight ladders of fixed facilities such as fire water tanks ② Reinforcement and rust prevention maintenance of straight ladders of fixed facilities ③ Addition of safety fences and warning signs for all high platforms



Alternation: situation of high platforms before alternation.



Application: accessories for improvement of benchmarking of ladders and platforms.

Option 5: 2018 EHS Objectives, Indicators and Management Plan of the Operation and Management Department

Name of the plan	Targets/indicators	Environmental factors/sources of risks	Management plans
Improvement of safety and environmental management	Integration of EHS management requirements for business processes	Management improvement	① Integration of professional management processes for the business ② Streamlined EHS management requirements ③ Visualised EHS management requirements

Accomplishments:

1. Addition of 11 special items to the safety management process;
2. Evaluation of 165 business processes, submission of more than 120 revised proposals, and completion of EHS requirements integration for 26 processes;
3. Completion of 70 lean full stations in the pilot area of the headquarters and integration of team management requirements;
4. Visualization of regional map points for major sources of risks and important environmental factors.

PART IV CARE FOR STAFF

Option 6: 2018 EHS Objectives, Indicators and Management Plan of the Inspection and Testing Centre (Adjusted)

Name of the plan	Targets/indicators	Environmental factors/sources of risks	Management plans
Noise reduction in the test area	On-site noise reduction value $\geq 12\text{dB}$	Noise hazard	<ul style="list-style-type: none"> ① Research, review and pilot installation of the test environment noise reduction plans ② Preparation and full implementation of noise reduction plans and technical specifications ③ Completion acceptance and compliance of noise with national occupational health standards



Before Alternation: 4,000 rpm with an average noise of 93dB.



After Alternation: 4,000 rpm with noise reduction of more than 14dB in each district.

PART IV CARE FOR STAFF



4. Conducting inspection led by senior management to assume major responsibility of safety management

The Company's safety leaders-in-charge and the head of safety management department conducted field visits and surveys on all production units, inspected the distribution and control measures of major sources of risks of each unit, and inspected the development and implementation of the safety and environmental protection management system in detail. Rectification was carried out on the problems found and new requirements were given on the safety management work for 2019.



Baoji Times structural parts workshop

The Company's leaders led the team to conduct on-site research in 4 units including Ningbo Times, Communication Signal, Baoji Times and IGBT Manufacturing Centre, and put forward work requirements.



IGBT waste liquid room



Listening to the semiconductor report

The Company's leaders led the team to conduct research in 8 manufacturing units and the semiconductor division and made important instructions.



Carrying out inspection in workshops



Ningbo Times' hazardous chemicals library



Changsha Metro Line 4

The Company's leaders led the team to conduct on-site research in 4 units including Ningbo Times, Communication Signal, Baoji Times and IGBT Manufacturing Centre, and put forward work requirements.



Inspection and testing centre



IGBT fire duty room



Manufacturing centre and collection centre

The Company's leaders led the team to check the safe production at night, leading cadres on duty, security surveillance video, security guards on-duty, and equipment and facilities operation.

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5. Strengthening safety and environmental protection training to enhance safety awareness and safety skills of staff

Through various approaches such as “Going out and Bringing in”, the Company further has strengthened various safety and environmental education and training work, organised various forms of education and training activities to improve staff safety, with 22,550 person-times of safety trainings at all levels in 2018.

2018 Annual EHS Training List

Number	Training type	Number of people	Number	Training type	Number of people
1	“3-Tier” safety training for newcomers	1,449	7	Training for returning employees	3
2	Training on special operation	1,919	8	Job-rotation training	66
3	Training for safety management personnel	148	9	Training on new techniques, new technology, new materials and new equipment	700
4	Safety training for the main person-in-charge of the Company	126	10	Occupation health training	836
5	Training for middle management and above	126	11	Training for all staff	7,516
6	Safety training for team foremen	148	12	Other trainings	9,513
Total					22,550

6. Safety assessment on premises for storage and use of dangerous chemicals

In 2018, the Company has invited professional institutions and the Safety Supervisory Department of Zhuzhou City to conduct special assessments on the Company’s worksites involving use of dangerous chemicals. The scope of evaluation included purchase, storage and usage of dangerous chemicals, as well as chemistry analysis and formulation of emergency response measures. The Company organized special meetings of each unit to formulate rectification plan of worksites involving use of dangerous chemicals, conduct statistical work on categories of dangerous chemicals in each unit and compile a list for the Company, standardise notices and safety warning signs at worksites, places and ways of chemical storage, and hazardous waste notices and signs on all containers. In September 2018, the Company and the Safety Supervisory Department of Zhuzhou City conducted an assessment on current condition, which was approved and filed.

PART IV CARE FOR STAFF



7. Conduction safety hazard inspection and monthly self-inspection, rectification and reporting of safety hazard

According to the annual safety inspection plan, the Company conducted various safety and environmental inspections on a regular basis, complemented with special safety and environmental inspections and integrated major safety inspections, in order to understand the safety and environmental conditions in a timely manner. The Company and each unit organised various safety inspections and handled security risks according to the “Five Implementations” principles, which included the implementation of rectification measures, provision of rectification funds, designation of person in charge for rectification, setting of time limit for rectification and implementation of emergency plans. As at December 2018, 3,353 security risks were discovered in inspections at all levels, and the rectification of 3,351 security risks were completed, representing a completion rate of 99.95%. Meanwhile, the Company submitted the Monthly Report on the Self-inspection and Self-rectification of Risks of Safety Production Incident to the Safety Supervisory Department of Zhuzhou City, which disclosed the self-inspection and self-rectification of risks by the Company.

8. Organizing special safety activities to build safety culture

The Company organised road shows on occupational health. On 11 June, the 2018 Occupational Health and Safety Experience Class at the outdoor area of Tianxin Industrial Park was held. The event was organised by the operation and management department of the Company, and co-organised by the Manufacturing and Collection Centre and 3M. The experience class featured Flash animation, equipment experience, simulation game and APP online prize quiz. Management and staff responsible for occupational hazards from each business unit of the Company took turn to participate in the class, and imparted knowledge of occupational health and safety in an in-depth manner with lively demonstrations.



PART IV CARE FOR STAFF

A fire drill was held. From 9:00am to 3:00pm, 14 June, the manufacturing centre and the collection centre of the Company conducted a fire drill at the rainbow court of Tianxin Industrial Park. There were more than 860 participants from the Manufacturing and Collection Centre. Through the fire drill, knowledge on fire escape and self-help was promoted and the staff's awareness of fire safety was enhanced. The event was a highlight of the 2018 Safety Production Month activities, which created a positive safety culture for the "630 Sprint".



The 8th Special Equipment Safety Skills Competition of the Manufacturing and Collection Centre was launched. On 18 May, the Manufacturing and Collection Centre launched the 8th Special Equipment Operator Skills Competition. Through obstacle race and competitions of speed, balance and stability of lifting objects, operation skills and mental quality of special equipment operators were tested. Operation skills and safety awareness of special equipment operators were enhanced, while the implementation of corporate safety management responsibility was further facilitated. The competition featured three major categories: pallet transfer vehicles, high capacity electric forklifts and overhead cranes. Besides traditional events of "Entering narrow doors with large objects on forklifts" and "Lifting buckets with bridge cranes", a new event "Putting nails into wine bottles with forklifts" was introduced in the competition. There was a total of 108 participants from the Manufacturing and Collection Centre, representing a participation rate of 95.1%.



PART IV CARE FOR STAFF



The Company organised safety activities for related parties. In order to enhance safety management of related parties of the Company, strengthen management of related parties and reduce adverse effects of related parties to the Company's operation, on 20 July, the Company organised safety management training for safety management staff. There were around 40 participants. The training mainly included promotion of laws and regulations, safety management system for related parties and safety requirements of risky operations. Besides, the units also conducted self-inspection on related party safety management. From 31 July to 1 August, the Company conducted a special inspection on related party safety management and discovered 6 issues. Notices were published to request rectification by the units. On 20 August, the Company invited 69 contracted project leaders to participate in the related party training. Through promotion of related party regulation standards and requirements, regulations on related party EHS management, work procedures for related party, and dangerous work protection requirements for related party, the related parties learnt about the EHS policies and requirements of the Company, enhanced understanding on the environmental and safety risks of work procedures, and thus facilitated subsequent implementation of related party management.

9. Caring for staff health and conducting occupational health tasks

The Company regularly conducts occupational health examinations for employees engaged in positions involving occupational hazards before, during and after their tenure to keep abreast of the health status of employees and avoid occupational accidents. The Zhuzhou City Occupational Disease Prevention and Control Centre conducted on-site monitoring of occupational hazards. The number of detected sites was 89, and the number of sites meeting the standard was 84, representing a compliance rate of 94.38%.

10. Strengthening emergency response management and completing filing of emergency plan

There were many layouts and texts for on-site disposal plans in the past which were not very effective in guiding the actual operation, and were more suitable for use as a training. The Company has simplified the plans and organized 1 comprehensive plan; 8 company-level special plans; and 59 business unit-level special plans, which have practical significance for on-site emergency, and the plans have been submitted to the security supervision for filing, which is conducive to comprehensive emergency response.

IV. INTERESTS OF STAFF

1. Implementing system of Workers' Congress to safeguard employees' interests

As the basic form of practicing democratic management by enterprises, the Workers' Congress is an organization body for workers to exercise the power of democratic management in accordance with the provisions of laws. Based on the principle of democratic centralism, the Company established its Workers' Congress system in accordance with relevant requirements under the Trade Union Law.

The Council of Labour Union is the operating authority of the Workers' Congress and it is responsible for the daily work of the Workers' Congress. It has 147 existing staff representatives elected democratically from cadres (staff) in various departments (units), involving personnel from various fields of the Company, such as management, technology, production and marketing. The Workers' Congress system has strengthened the Company's democratic management effectively, guaranteed the rights of staff to exercise democratic management according to the law, fully utilized staff's motivation and creativity, and therefore effectively enhanced our enterprise quality and economic benefits.

Over 100 suggestions received at the 2018 Workers' Congress were sorted and processed, involving issues such as the pressure control of Two Funds, labour management, cost reduction and efficiency increase, livelihood measures, talent flow and career planning, salary reform, resource balance, and industrial development.

PART IV CARE FOR STAFF



2. Maintaining mechanism for communication between senior management and frontline staff and difficulty assistance mechanism, and establishing mechanism to create harmonious labour relationship

- (1) In order to continuously increase corporate competitiveness and establish a harmonious labour relationship, the Company actively expanded the democratic channel with the views to motivate staff's incentives and creativity as well as effectively exploit potential resources. In 2018, the Company accepted 1,620 reasonable proposals from its staff. The adoption rate of reasonable proposals from its staff was 100%.
- (2) The Company set up the "Leadership Reception Day" system. The Company's leaders met with fundamental staff regularly every week, listened to their opinions in person, and offered replies and solutions on the spot.
- (3) The Company set up contact sites for public opinions to serve fundamental staff, with branch presidents as the liaison officers of the units for public opinions. The Company also established fundamental labour union that covered all systems of the Company with targeted communication and liaison stations for the fundamental staff and other employees, so as to gain an in-depth understanding of the staff's concerns and requests.
- (4) The Company implemented a point-based award management system by establishing a point-based award platform, where fundamental staff are awarded for reasonable suggestions, so as to encourage them to actively participate in management innovation and improvement of production quality of the Company. In 2018, the Company received a total of 5,880 improvement suggestions.
- (5) In 2018, the Company further promoted the contact point system of the management members, who carried out the management work along with integration of required content and optional content, with an aim to understand the situation, provide guidance and solution at the lower level. Throughout the year, the Company carried out 6 cadre/employee symposiums and 13 functional department exchange meetings and participated in various forms of team activities for more than 40 times, and truly went deep into the front line. The Company also summarized and replied to more than 100 opinions and suggestions on various aspects including the Company's development, compensation and benefits, personnel training, logistics support, and employee care.

PART IV CARE FOR STAFF



3. Focusing on EAP implementation to ensure mental health of staff

The Company organized the kick-off meeting of "Active Organizational Culture Construction Project featuring EAP" to fully publicize the three major service targets, four service platforms, and five EAP projects for service content; and launched module activities such as the Heart Hotline, Heart School, Heart Classes. The Company launched the 7×24-hour Energy Heart Hotline in EAP's five service modules to provide hotline assistance for employees; launched the EAP Workplace Heart Academy module and invited career capital development instructor Zeng Lei to teach micro-courses on effective workplace communication and family relationship tips;

The Company organized 10 core employees to participate in the China EAP Annual Summit and 20th Anniversary Celebration. The Company's EAP project was introduced and promoted by the president of China EAP Association as a typical case;

The Company organized the advanced special training of "Active Organizational Culture Construction Project featuring EAP" for the core team, learnt the conceptual framework and application of focus solution, absorbed new knowledge to enhance itself, and served the project and served the Company with better professionalism;



The Company organized group stress relieving activities among the information centre technical staff. The company organized a psychological counsellor to go to the Wuhan maintenance base to carry out the third quarter employee supporting activity for the "Happy Train to the Grassroots";

PART IV CARE FOR STAFF

The Company organized the professional managers of the branches of the technical centre and more than 30 cadres above C-level to carry out the “Dynamic Autumn and Inspired Four Seasons” African Drum Salon activity of the Electric Energy Station, to relieve pressure on employees in a new way of “inspiration” and promote cross-departmental collaboration and integration;

The Company planned to carry out the DIY activity of “Building a beautiful home and sharing a good life” with a theme of Mid-Autumn Festival reunion. More than 120 marketing executives, managers, technicians, retrained after-sales service personnel stationed abroad, and production site personnel participated in the activity of individual areas.



4. Focusing on “Six Donations and Three Focuses” to care for staff

This year, 169 grassroots employees were subsidized with the mutual aid and mutual support solatium of RMB94,860, mutual aid and mutual support subsidy of RMB6,666, “Six Donations and Three Focuses” solatium of RMB24,300, and “Six Donations and Three Focuses” subsidy of RMB93,370.

A total of 4,764 computer holders were issued for members who use desktop LCD computers; and 532 cashmere sweaters and backpacks were distributed for after-sales service personnel at the after-sales standardization site. The Company also built 9 lactation rooms and showed specialized care for after-sales lactation women workers.

PART IV CARE FOR STAFF



The Company encouraged its staff to attend talks on health knowledge, family education and cardiovascular health, and “Little Sprout” special body check and talk on children insurance, while trade union cadres were arranged to attend trainings on supplementary medical insurance and trade union system. The Company also organised quarterly movie-watching events with the theme of “Building a beautiful home and sharing a good life”, cared about spare time of its single staff and increased resources for its single staff to purchase properties.

The Company organised body check and cared about employees’ health. The Company arranged gynecological examination for 902 married female staff and body check for 1,525 staff aged 35 and above. To provide better care of employees’ health, the trade union adopted the body check plan of “regular items + optional items”. Besides over 10 regular body check items including blood glucose and lipids, liver and kidney function, employees could also choose 5 of the 12 new body check items according to previous body check results and individual health conditions.

The Company supported after-sales service staff and frontline staff through the “Sharing Coolness” campaign. The Company organised “Sharing Coolness and Care” activity, held seminars to listen to views and paid attention to safety inspection, which focused on frontline research and manufacturing staff and outstation after-sales service staff working without air conditioners, working outdoors or working for long hours. With supplies of RMB830,000 and equipment of RMB130,000 distributed to 14 branches, frontline staff working in high temperature and in need for coolness were helped.

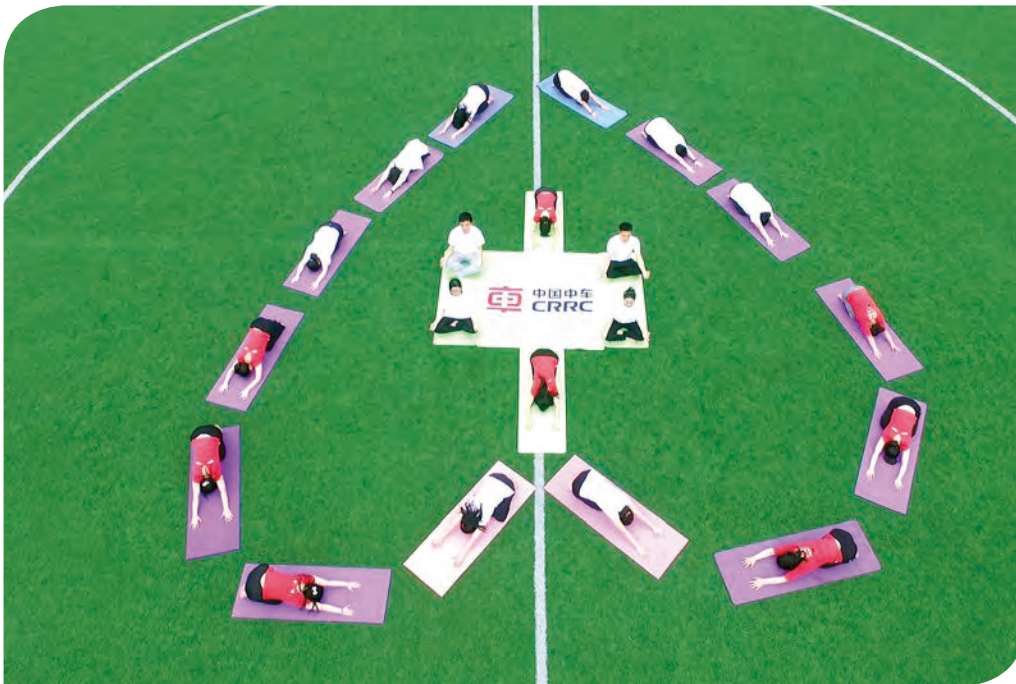
The Company cared about families with major difficulties through student grants. The Company provided student grants of RMB79,000 to support 25 children of 6 households of staff with difficulties who possessed willingness and abilities to pursue further study, especially those with an established case (including both current students and new students entering school in a year).

PART IV CARE FOR STAFF

5. Focusing on community activities to enhance happiness of female staff

The Company organized more than 100 women workers to hold the opening ceremony of the “Building a Beautiful Home and Sharing a Better Life” Women Workers’ Home Construction and Weekend Girls’ School events. The Company shared the purpose and significance of building an upgraded version of the community, so as to build a home full of the sense of belongings, build a learning platform to enhance personal value, and give employees a good opportunity to broaden the breadth of life.

The Company organized more than 70 yoga enthusiasts from the “Weekend Girls’ School” yoga society to participate in the “Different Love Postures of CRRC employees on 20th May” activity to bravely express different love and gratitude to the Company which gives us development platform, to the family members who support us and to the colleagues who work hand in hand with us, showing the positive spirit of loving work and life of the women workers.



The Company organized a yoga community to conduct water yoga and yoga tea sessions. Members shared the experience of the road to yoga, told the story of their own path of persistence and the benefits, and expressed their love for home and the changes that yoga brings to the body through displays of asanas.

The Company organized more than 60 enthusiasts from the “Weekend Girls’ School” skill and wisdom society to participate in the staff ceramics activity of “Beautiful CRRC, Beautiful Labour and Beautiful Era”, demonstrating the spirit of the Company’s employees of reaching the acme of perfection.

The Company organized two campaigns of “Substituting Feminine Strength for Beauty” women’s self-defence training camp, providing effective guidance for defence awareness and defending techniques for the safety in summer and employees working overtime.

PART IV CARE FOR STAFF



The Company launched the community open month activity of “Building a Beautiful Home Together and Sharing a Better Life” of the thanksgiving season series in August. The “Companionship of Love Parent-child Yoga Class” and the “Growth of Love Parent-child Badminton Class” for the employees’ children were designed to develop children’s interests and enjoy family time; and the “Cultivation of Love Staff Dance Class” and the “Warmth of Love Staff Painting Class” for the employees were designed to enrich employees’ spare time and bloom personal elegance so as to enhance personal accomplishment. A total of 15 courses per week for the events highlighted the Company’s continued focus on employee growth and its mobility to enhance employees’ happiness.

The Company organized the dance club to rehearse the Boomboom Jazz Dance to perform the colourful fluorescent run and singing competition of “Welcoming Party Congress and Sprinting 2018”, creating an atmosphere for the event and showing youthfulness.

6. Continuously carrying out diverse sports activities including light volleyball, badminton, football and basketball through sports club to ensure health of staff

The Company organized various ball games and participated in the annual cultural and sports activities of Zhuzhou, and won the championship in men’s and women’s light volleyball, badminton and football matches.

6 contestants were organized to represent the departments to participate in the Zhuhai City Overseas Chinese “Guixin Cup” badminton mixed team competition and won the fourth place. 11 players were organized to participate in the Zhuzhou City’s third light volleyball competition and won the third prize; and 1 player was organized to represent Zhuzhou City to participate in the light volleyball team competition of the 13th Hunan Games and won the second place.



PART V SOCIAL HARMONY

I. SUPPLY CHAIN MANAGEMENT

1. Management Measures

1. Resolving "meeting the direction of the Company's future development" as the guideline for selecting suppliers.
2. Signing annual performance agreements with key suppliers, monitoring key performance and arranging specialized management and control work.
3. Conducting regular business exchanges with key strategic suppliers quarterly to promote the improvement of both parties.
4. Dispatching quality engineers and quality inspectors for onsite supervision of companies with frequent quality problems to improve the level of quality management of suppliers.
5. Promoting e-procurement information platform and order collaboration with suppliers to improve information exchange with them and reduce transaction costs.
6. Conducting exchanges with suppliers to improve supply chain management and control and drive down the costs of supplies.

2. Support to Suppliers

Taking the Company's development strategy as the development orientation, the strategic layout of the Company's key business segments has corresponded to the external supply chain resource management, focusing on the improvement of the manufacturing capabilities of the external suppliers. With the QCD indicator as the traction, we have set up project teams and adopted planned support management through training, exchanges, seminars, reports, and management forums. The Company has fully helped suppliers understand the needs and communicated with them to form a mutually beneficial and win-win ecosystem. The Company has the following ideas in respect of management and control.

2.1 On-site Management

The 5S basic management is the premise to promote the improvement of the Company's QCD indicators, and is the cornerstone of lean management. The Company started from the 5S site basic management, through fixation management, normalized 5S activities, inspection and rectification, to help suppliers strengthen daily management, so that the site logistics and information flow are smooth, and the production is in an orderly manner. The Company has gradually realized visual and trace management to improve quality, efficiency and inventory.

2.2 Quality Management

The Company is problem-oriented and has learnt to carry out bottom-up quality analyses, and has identified customer needs through the hierarchical management of problems, conducted introspection and analysis, and gone in to the source of the matter and solved the fundamental problem, thus improving the overall quality level. Through the introduction of tools and methods such as the "Misplaced Parts Activity", quality case analysis, and special improvement of TOP4 issues, the product process quality control ability has been improved; at the same time, the ability training for quality control personnel has been organized, the inspection standard has been improved, and the quality and ability of quality control personnel have been improved.

PART V SOCIAL HARMONY



2.3 Plan Management and Control

In the future, demand will drive the front-end production management plan. The Company will implement the introduction of the “three-three-three” rolling production plan from the four aspects of production planning, material planning management and optimization, management and control improvement under the planning schedule, and ERP production management module, and establish a monthly inventory management mechanism for production; establish the material preparation mechanism and safety stock mechanism; continue to improve the production planning evaluation system, optimize the control under the plan, and sort out the establishment of a management mechanism for the lack of materials; and increase the on-time completion rate of the production plan and ultimately achieve the production plan on time.

2.4 Lean Operation

Combined with the actual production situation of the suppliers, the Company starts with the production plan and abnormal management, introduces the hierarchical meeting model, and stimulates the upstream and downstream interface relationship departments and functional departments to simplify the inter-departmental cooperation process to form standardized information communication channels and methods and achieve the fast response and resolution of exceptions, finally satisfying the customer delivery demand.

3. Local Purchase to Promote Local Development

The Company has summed up a set of scientific, rigorous and perfect quality management and control programs, and trained more than 300 welders of EN15085 international welding certification for enterprises and society. The strict job skill admission system has provided a typical example for the quality assurance of key components of high-speed rail, motor trains, subways and locomotives, and achieved a steady improvement in the quality of rail transit products, and also promoted the overall capacity improvement of the entire rail transit component industry chain. Through the continued support and guidance of the Company, the number of strategic suppliers in the region has increased from 4 to 8; and the total output value of strategic suppliers in the region has increased from 350 million in 2011 to 700 million in 2018. At the same time, the number of persons employed by strategic suppliers has increased from more than 1,300 in 2011 to more than 4,100 in 2018. In 2011, the Changsha-Zhuzhou-Xiangtan area had no obvious regional advantages in the domestic high-end panel cabinet manufacturing industry. As of 2018, some outstanding suppliers have become the “leaders” in the production of high-end electric panel cabinets for rail transit, reaching the world’s leading level, and have started business cooperation with international companies such as Siemens, Bombardier and Hitachi. Based on the proportion of total purchase amount, Zhuzhou City’s suppliers accounted for 82.5%, and the Changsha-Zhuzhou-Xiangtan Economic Zone accounted for 91.5%, which has promoted the employment of the outsourcing factories and increased production capacity. Such social contribution has driven the development of the local economy.

II. PUBLIC CHARITY

The Company understands the importance of community growth, in 2018, the Company actively launched different kinds of activities under the themes of social responsibility and dedication, including social assistance, student support and environmental practice.

PART V SOCIAL HARMONY

1. Establishing the “Dandelion” education supporting platform for a variety of education subsidies

The Company relied on the Yuexing Volunteer Association to establish the charitable “Dandelion” platform for education sponsorship. Through the launch of the three series of activities this year, a total of 11 generous families and 11 impoverished students were registered. Over 700 benefactors participated in the event throughout the year, raising funds of RMB17,664.83 and a large number of donations in kind. The Company guided its employees to practice the core values of “walking the righteous path with the righteous mind and doing good deeds with good intention”, and gathered young positive energy and established a good corporate image.



PART V SOCIAL HARMONY

2. Hosting “Shade of Trees Action” for tree planting

The young employees of the Company relied on the “Lei Feng Month” in March to carry out the “Social Responsibility Dedication Month” series of activities throughout the Company, and called on all employees to consolidate their sense of dedication and practice social responsibility. A total of more than 200 volunteers participated in the greening and tree planting activities along the Zhuzhou City Riverside Scenic Belt. A total of more than 300 tree seedlings were planted, and the green area was more than 600 square metres, which made due contributions to the construction of beautiful Zhuzhou. Through this tree planting activity, the Company’s employees’ awareness of environmental protection has been enhanced, and the sense of ownership of the beautiful Zhuzhou and the sense of responsibility of greening homes have been strengthened.



PART V SOCIAL HARMONY

3. “Contributing Life Source and Lighting up the Life” blood donation activity

The Company further guided its staff to pass on love and positive energy. The Company’s League Committee and the Yuexing Volunteer Association jointly cooperated with Zhuzhou City Centre Blood Station to carry out the charitable donation activities of “Dedicating the Source of Life and Lighting up the Light of Life”, and calling on the employees to participate actively, and to give love and care for life. The blood donation activity is the best evidence of the dedication to society and the giving back to society by the employees of the Company. Blood is the source of life, while love is the light of life. Voluntary blood donation lights up the hopes of others’ lives and illuminates the beauty of your own soul. Since the establishment of the Company, its employees have been giving blood continuously, which has been highly recognised by the government and society. China Times Electric was listed as “Zhuzhou City Emergency Blood Donation Unit”.



PART V SOCIAL HARMONY

4. Social contribution month themed activities

The Company launched a series of public welfare activities centred on the Social Responsibility Dedication Month. In March, it organised electric youth volunteers to participate in the activities of “Imitating Lei Feng in Lei Feng’s Hometown” organised by the Communist Youth League Committee. They went to the Shifeng District Senior Care Home to express sympathy and solicitude, and organised youth volunteers to donate blood. On the principle of voluntariness, the “One Dollar Donation” activity of the Hope Project was carried out within the Company. The final donation was RMB3,000. The subordinate grassroots league organizations independently carried out special activities, such as visiting nursing homes, greening, and cleaning and repairing of the public bicycle sites. Such activities promoted the spirit of Lei Feng, practiced social responsibility, and injected positive energy into the enterprise.



PART V SOCIAL HARMONY

5. Targeted poverty alleviation activities

Since 2016, Jintai District of Baoji City has identified Hejiaqu Village in Xiashi Township as the enterprise-village supported target of Baoji CRRC Times under the Company. Baoji CRRC Times always bears in mind the social responsibilities that enterprises should shoulder. While the it has achieved rapid development by leaps and bounds, and in the case of where policy allows, it has repeatedly visited the supported targets to conduct on-site research and has done practical and good things for Hejiaqu Village within its capabilities. On 23 December 2018, the Tridacna Village (磬磬村) (formerly Hejiaqu Village) was paid RMB71,470 for honey and RMB45,900 for eggs. It received unanimous praise from Jintai District, Xiashi Township and the Supporting Village, which effectively enhanced social effects, popularity and reputation.



PART VI FUTURE OUTLOOK



In 2019, the Company will continue to adopt open mind set, focus on strategic target, leverage the innovative platform and improve refined management to achieve major breakthroughs in terms of system, industry, technology and efficiency.

1. Adopt open mind set to facilitate breakthrough in optimizing system. The first is to consolidate its position in the railway transportation industry and further expand growing industries through industry synergy. The second is to enhance the core competitiveness and actively response to external competitions by accumulating systematic competitiveness.
2. Focus on strategic target to realize multiple breakthroughs in the industry. The Company consolidates the cornerstone industries such as the railway, urban rail, rail engineering, communication signal, and semiconductor industries; enhances potential industries such as the braking, screen door, power supply, and high-end component industries; and develops strategic industries such as the offshore equipment and automotive industries, so as to make multiple breakthroughs in the industry.
3. Leverage the innovative platform to accelerate breakthroughs in technology and quality. By strengthening research in fundamental capabilities, upgrading key technological level and applying stringent quality control standards, the Company will enhance the supporting capacity of the innovative platform and achieve quick breakthroughs in technology and quality.
4. Improve refined management to enhance operational efficiency. By optimizing operation management and control, improving IPD system and strengthening capacity assurance, the Company will further enhance operational efficiency.

PART VII APPENDIX

INDEX OF THE ENVIRONMENTAL, SOCIAL AND GOVERNANCE REPORTING GUIDE

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		A2.1 Direct and/or indirect energy consumption by type (e.g. electricity, gas or oil) in total (kWh in '000s) and intensity (e.g. per unit of production volume, per facility)	P47
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PART VII APPENDIX

Environmental, Social and Governance Reporting Guide			Subject Areas
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	Community		
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