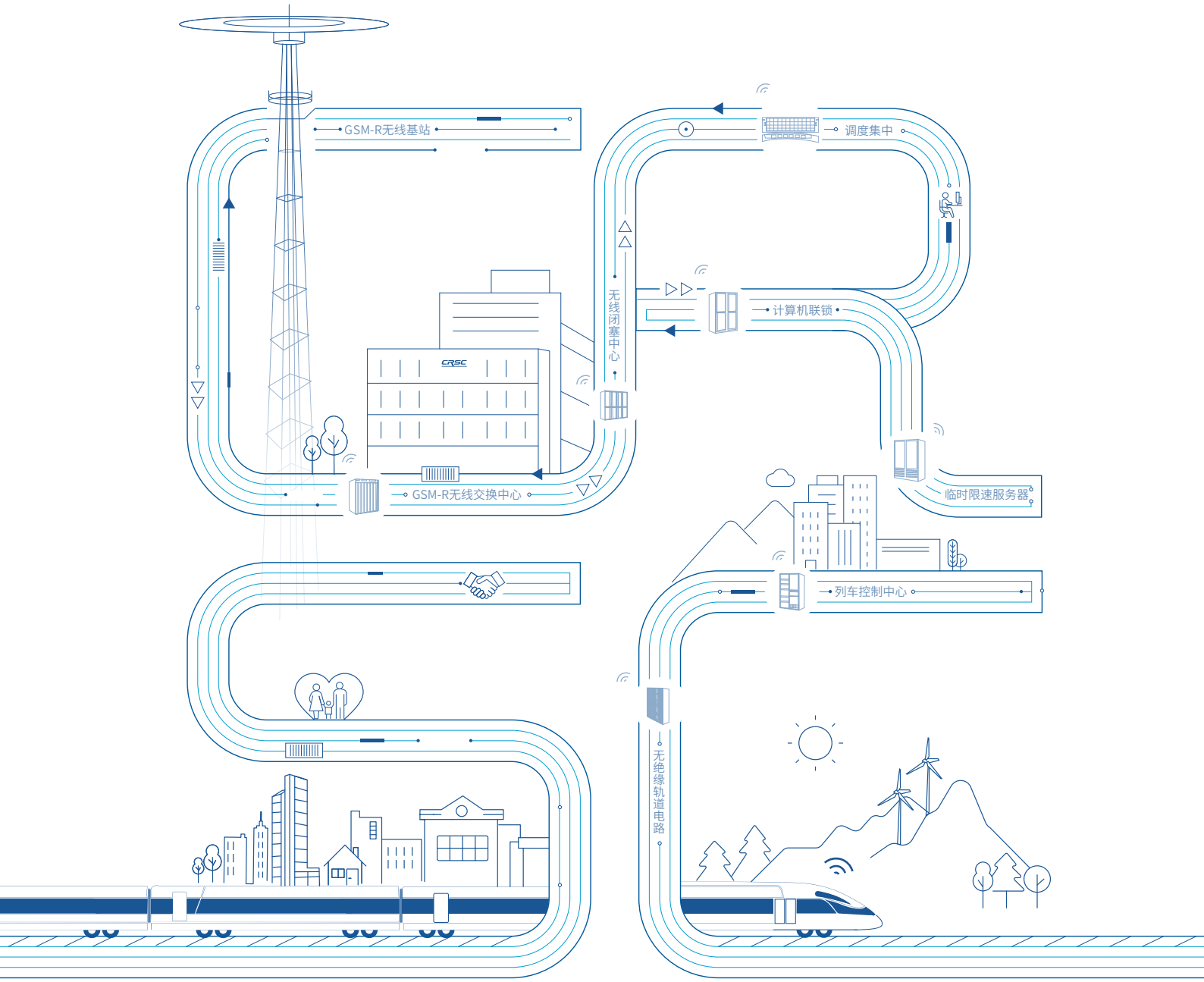
CRSC
中国通号



2022 环境、社会及管治报告

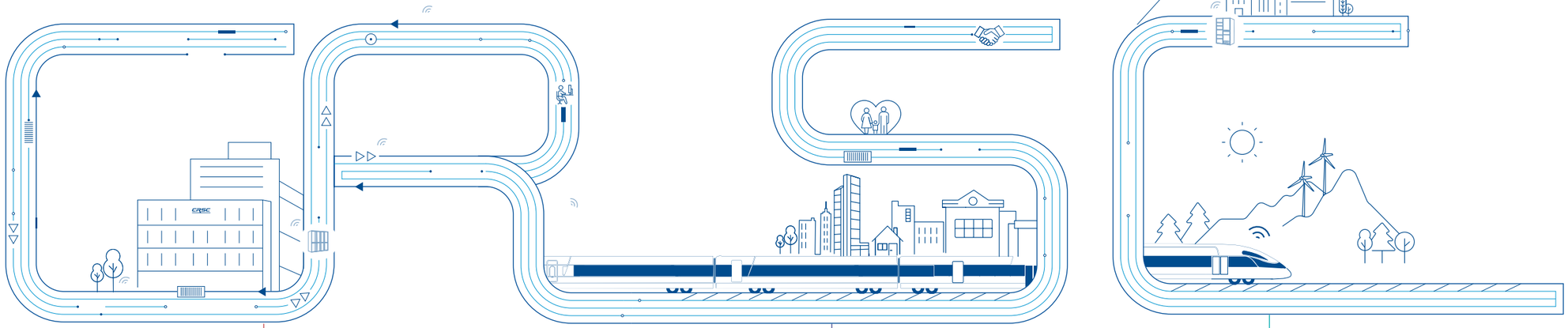
Environmental, Social and Governance Report

中国铁路通信信号股份有限公司

China Railway Signal & Communication Co.,LTD.

目录

CONTENTS



02 关于本报告
About this Report

04 董事长致辞
Chairman's Statement

08 关于我们
About Us

08 公司简介
Company Profile

09 发展战略
Development Strategy

10 业务布局
Business Layout

11 企业文化
Company Culture

理念篇 Concept

12 心之所往 弘扬责任文化
Listen to Our Heart and Carry forward the Culture of Responsibility

14 可持续发展理念
Sustainability Concept

15 可持续发展治理
Sustainability Governance

16 实质性议题识别
Identification of Material Issues

18 利益相关方沟通
Stakeholder Communication

管理篇 Management

20 信之所倚 夯实责任基础
Rely on Trust and Build a Firm Foundation of Responsibility

22 公司治理，强基固本
Corporate Governance and Solid Foundation

28 合规管理，依法运营
Compliance Management and Law-based Operations

29 风险防控，筑牢防线
Risk Prevention & Control and Strong Defense against Risks

30 党建领航，行稳致远
Party's Leadership and Steady Progress

32 反腐倡廉，风清气正
Anti-corruption and Honesty & Integrity

实践篇 Practice

34 行之所至 书写责任担当
Take Actions and Manifest Corporate Social Responsibilities

36 创新驱动，赋能发展
Empower Development Driven by Innovation

47 匠心品质，服务客户
Provide Quality Service for Clients

54 绿色“双碳”，呵护生态
Protect Ecosystems through Green Development under "Carbon Peaking and Carbon Neutrality" Background

65 人才关爱，成就员工
Cherish Talents and Achieve Staff's Value

75 交流合作，携手共赢
Achieve a Win-win Situation through Exchange and Cooperation

82 乐于奉献，回馈社会
Contribute to the Society

90 未来展望
Future Outlook

92 附录
Appendix

92 ESG 指标索引
HKEX ESG Reporting Guide

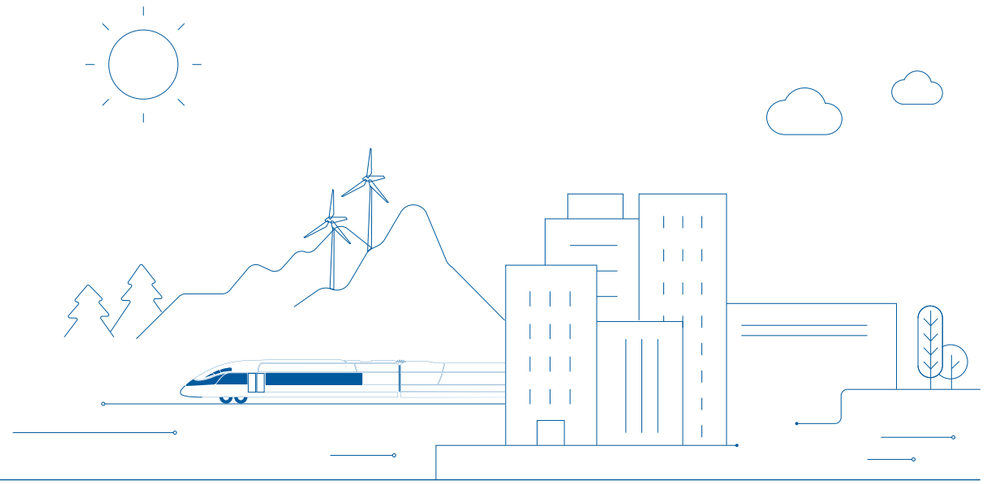
96 评级报告
Rating Report

98 意见反馈
Feedback

关于本报告
About this Report

本报告是中国铁路通信信号股份有限公司发布的第三份环境、社会及管治报告，本着客观全面、规范透明的原则，详细阐述 2022 年度公司环境、社会及管治工作的管理理念、亮点实践及年度成效。本报告以中文及英文编制，如有差异，请以中文文本为准。

This Report is the 3rd Environmental, Social and Governance Report of China Railway Signal & Communication Co.,Ltd. Based on objective, comprehensive, regulative and transparent principles, this Report expounds management ideas, key practices and annual achievements for environmental, social and governance work of China Railway Signal & Communication Co., Ltd. in 2022. This Report is compiled in Chinese and English versions. Should there be any minor content difference, the Chinese version prevails.



报告范围
Scope of the Report

除特殊说明外，本报告涵盖中国铁路通信信号股份有限公司总部、分支机构及附属公司，与《中国铁路通信信号股份有限公司 2022 年年度报告》对外披露范围保持一致。

Unless otherwise stated, this Report includes China Railway Signal & Communication Co., Ltd.'s headquarters, all its branches and subsidiaries, with the same scope of *the 2022 Annual Report of China Railway Signal & Communication Co., Ltd.*

时间范围为 2022 年 1 月 1 日至 2022 年 12 月 31 日，部分内容超出此范围。

The reporting period is from Saturday, January 1, 2022 to Saturday, December 31, 2022. Some contents are sourced from historical data.

参考标准
Reference Standards

全球报告倡议组织《可持续发展报告标准（GRI Standards）》

The Sustainability Reporting Guidelines issued by the Global Reporting Initiative (GRI)

国务院国资委《关于国有企业更好履行社会责任的指导意见》

The Guidelines on Corporate Social Responsibility of State-owned Companies issued by State-owned Assets Supervision and Administration Commission (SASAC) of the State Council

中国社会科学院《中国企业社会责任报告指南（CASS-ESG5.0）》

The Chinese Corporate Social Responsibility (CSR) Report Preparation Guide (CASS-ESG5.0) by the Chinese Academy of Social Sciences

香港联合交易所《环境、社会及管治报告指引》

The Guidelines on Environmental, Social and Governance Report issued by HKEX

上海证券交易所《上市公司环境信息披露指引》

The Guidelines on Environmental Information Disclosure of Listed Companies issued by Shanghai Stock Exchange

气候相关财务信息披露工作组建议（TCFD）

The Recommendations of the Task Force on Climate-related Financial Disclosures (TCFD)

发布周期
Reporting Cycle

本报告为年度报告，于每年 3-4 月发布。

This is an annual report released in March or April.

称谓说明
Reporting Specification

为便于表达，本报告中提及的“中国通号”“公司”“我们”等均指代“中国铁路通信信号股份有限公司”。

For the convenience of expression, “China Railway Signal & Communication Co., Ltd.” may be expressed as “CRSC”, the “Company” and “We”.

可靠性保证
Reliability Guarantee

公司董事会承诺对报告内容进行监督，确保不存在虚假记载、误导性陈述或重大遗漏。

The board of directors of the Company promises to supervise the content of the Report to ensure that there are no false records, misleading statements or major omissions.

数据说明
Data Specification

本报告关键财务绩效来自《中国铁路通信信号股份有限公司 2022 年年度报告》，其他数据来自公司内部管理体系。本报告相对公司往年 ESG 报告披露范围并无重大调整，且使用一致的披露统计方法。

All key financial performance data disclosed in this Report are collected from *the 2022 Annual Report of China Railway Signal & Communication Co., Ltd.*, and other data are mainly sourced from internal management systems of the Group. This report has no significant adjustment to the scope of the company's ESG report disclosure in previous years, and uses a consistent statistical method of disclosure.

报告获取
Access to the Report

本报告提供纸质版和电子版两种形式。您可以登陆中国铁路通信信号股份有限公司门户网站“文化与责任–社会责任”板块或香港联合交易所、上海证券交易所网站阅读或下载本报告。

This report is available both in hard copy and electronic format. You may browse or download the Report at the official website of CRSC (Culture & Responsibility - Social Responsibility) or at the website of Hong Kong Stock Exchange and Shanghai Stock Exchange.



董事长致辞 CHAIRMAN'S STATEMENT



董事长 周志亮
Chairman Zhou Zhiliang

中国铁路通信信号股份有限公司
China Railway Signal & Communication Co., Ltd.

中国通号对于社会责任和 ESG 的履行，发轫于我们成立 70 年来的历史担当和光荣使命，发轫于千万通号人创造的辉煌成就，发轫于“发展国家列控技术民族产业，引领全球轨道交通技术进步，守护人们美好出行”的企业使命。在党中央、国务院、国资委的坚强领导下，我们的社会责任和 ESG 工作质效双升、捷报频传。2023 年是全面贯彻落实党的二十大精神的开局之年，是实施“十四五”规划承上启下的关键之年，我们将进一步深悟初心使命，细照往年社会责任和 ESG 工作，深化履责担当，筑牢社会责任管理和 ESG 建设根基，开启公司高质量发展新征程。

CRSC's fulfillment of social responsibility and ESG originates from our sense of historical responsibility and glorious mission since its establishment 70 years ago, from the brilliant achievements created by tens of thousands of CRSC people, and from the corporate mission of "developing the national industry with train control technology, leading the technological progress of global rail transit and guarding people's beautiful travel". Under the strong leadership of the CPC Central Committee, the State Council and the State-owned Assets Supervision and Administration Commission, the quality and efficiency of our social responsibility and ESG work have been improved, and good news keeps pouring in. 2023 is the first year to fully implement the spirit of the 20th CPC National Congress, and it will also be a crucial year for implementing the 14th Five-Year Plan. We will further understand our original mission, carefully review our previous social responsibility and ESG work, and deepen our responsibility performance, laying a solid foundation for social responsibility management and ESG construction, enabling us to embark on a new journey of high-quality development.

回顾 2022 年，我们在 ESG 领域取得的成绩可彰可表。公司 ESG 工作实现常态化、系统化运行，自 2021 年起连续 2 年发布 ESG 报告，有效促进了责任管理和信息披露水平的稳步提升，有力推动了责任实践的常态化履行。我们胸怀“国之大者”，勇担国家列控技术民族产业发展重任，加快向具有全球竞争力的世界一流企业迈进；坚持自主创新，多项科创成果世界领先，创新引擎更为强劲；深入落实“一带一路”倡议，推动中国技术和标准“走出去”，向世界展示“中国高铁”靓丽名片。我们共赴“绿色未来”，积极践行“双碳”战略，在产品设计、研发、生产、应用全过程深入践行绿色低碳理念，引领轨道交通装备行业向绿色、智能方向发展。我们厚植“家国情怀”，始终坚持以人为本，聚焦员工所想、社会所思、群众所盼，持续打造负责任供应链，全力做好乡村振兴、公益慈善等工作，以爱心传递温暖与关怀。

Looking back on 2022, we have made remarkable achievements in ESG. The ESG work was carried out on a regular and systematic basis. Since 2021, we have released the ESG report for two consecutive years, effectively promoting the steady improvement in CSR management and information disclosure, and giving a strong impetus to the normalization of CSR practices. Keeping in mind "the top priorities of the country", we take responsibility for developing the national industry with train control technology, and accelerate progress towards a world-class company with global competitiveness. We are committed to independent innovation, leading the world in scientific and technological achievements, and creating a stronger innovation engine. We will further implement the "Belt and Road Initiative" (BRI) to promote China's technology and standards to "go global" and show "China's High-Speed Rail" to the world. For the "green future", we actively practice the "carbon peaking and carbon neutrality" strategy, further integrate green and low-carbon concepts into the entire process of product design, R&D, manufacturing and application, and guide the rail transit equipment industry to develop in a green and intelligent direction. Being devoted to the family and country and adhering to the people-oriented principle, we focus on employees' thoughts, the society's aspirations and the masses' expectations, continue to build a responsible supply chain, and put our best effort into rural revitalization, public welfare and charity, etc. to spread warmth and care with love.

鉴于公司在 ESG 管理和社会、经济、环境信息披露水平方面的优异表现，2022 年，公司 2021 年 ESG 报告连续两年荣获明晟（MSCI）ESG 评级 “A” 级，被中国企业社会责任报告评级专家委员会评为五星级报告；社会责任案例多次入选国资委蓝皮书，成为央企履责典范；入选“央企先锋 50 指数”，荣获 ESG 金牛奖– “先锋企业”，受到广大利益相关方的高度关注和社会各界的一致好评。

In view of our outstanding performance in ESG management and social, economic and environmental information disclosure, in 2022, our 2021 ESG Report was A-rated by Morgan Stanley Capital International (MSCI) for two consecutive years and was five-star rated by the Chinese Expert Committee on CSR Rating. We have become a model for central SOEs to fulfill corporate social responsibilities as our CSR cases were included in the CSR Blue Book of SASAC several times. CRSC was selected as a component of the "State-owned Enterprises ESG Pioneer 50 Index" and won the title of "ESG Golden Bull Award Pioneer Enterprise". CRSC has received attention and praise from stakeholders and all walks of life.

走进新阶段，肩负新责任。党的二十大对央企履行社会责任提出了更高要求，国家轨道交通技术的高质量发展对通信信号企业 ESG 工作提出了更严标准，国资委、香港联合交易所、上海证券交易所等监管机构对上市公司 ESG 治理提出了更细规定。展望未来，我们可从三个方面持续加强 ESG 工作。

Entering a new stage and shouldering new responsibilities. The 20th CPC National Congress set higher requirements to the state-owned enterprises (SOEs) directly under the central government on fulfilling corporate social responsibilities, and set stricter standards for the ESG work of communication signal enterprises in order to achieve high-quality development of national rail transit technologies. The regulatory agencies such as State-owned Assets Supervision and Administration Commission (SASAC), Hong Kong Stock Exchange (HKEX) and Shanghai Stock Exchange (SSE) posed more detailed regulations for the ESG of listed companies. Looking ahead, we can continue to strengthen ESG work in three aspects.

第一，增强公司 ESG 工作使命感，主动服务国家发展大局。我们要坚决落实党中央重大战略决策部署，积极将自身发展融入新发展格局，聚焦主责主业，为建设交通强国不断做出新的更大贡献。第二，强化公司 ESG 治理工作的顶层设计，提升 ESG 管理水平。我们要紧抓国资委成立社会责任局的契机，进一步推动公司 ESG 工作规范化、制度化、科学化，筑牢风险防控根基。第三，推动公司 ESG 治理工作落实落细，为生态治理和美好社会做出更大贡献。我们要继续坚定服务国家 “双碳” 战略，积极做好全产业链降碳、减排等工作，始终把满足人民对美好生活的向往作为奋斗目标，在乡村振兴、志愿公益、爱心助学、应急救援等领域投入更多资源，彰显通号人的担当与奉献。

First, we shall harbor a stronger sense of mission with regard to ESG work, and actively serve the overall situation of national development. We must resolutely implement the major strategic decisions and arrangements made by the CPC Central Committee, actively integrate our own development into the new development pattern, focus on our main responsibilities and industries, and make new and greater contributions to building China into a transportation country. Second, we shall strengthen the top-level design with regard to ESG governance, and improve ESG management. We should see the establishment of the Social Responsibility Bureau by SASAC as an opportunity to push our ESG work towards standardization, institutionalization and scientization, and lay a solid foundation for risk prevention and control. Third, we shall further implement ESG corporate governance in an effective and detailed manner, and make greater contributions to ecological governance and a better society. We should continue to firmly serve the national "carbon peaking and carbon neutrality" strategy, actively carry out carbon reduction,and emission reduction across the industry chain, and always take satisfying people's yearning for a good and beautiful life as the goal for us to strive for, and invest more resources in rural revitalization, voluntary public welfare, care for students, emergency rescue and other fields to demonstrate the responsibility and dedication of CRSC people.

牢记职责使命，赓续百年初心。在 “十四五” 期末，我们要力争实现 ESG 管理体系日趋完善、ESG 责任品牌逐步成熟、ESG 实践持续深化的发展目标，追求效益和社会影响的平衡，提高公司美誉度，实现可持续发展、高质量发展。

Staying true to our responsibility and mission, and sustaining our original aspiration for a hundred years. At the end of the 14th Five-Year Plan period, we should strive for improving ESG management system, refining ESG brands and deepening ESG practice, balance benefits and social impact, improve our reputation, and achieve sustainable and high-quality development.

最后，我谨代表中国通号董事会及全体员工，向所有关心、支持和帮助中国通号发展的社会各界朋友和利益相关方致以最诚挚的感谢。面对美好未来的召唤，我们始终坚定信念、奋发进取，让我们携手同行，共创美好未来！

Finally, on behalf of the board of directors and all employees of CRSC, I would like to extend my deepest gratitude to all friends and stakeholders from all walks of life who care about, support and help CRSC's development. Looking ahead, we always keep faith and forge ahead. Let's join hands for a bright future!

关于我们
About Us

公司简介
Company Profile

中国通号是以轨道交通控制技术为特色的高科技产业服务商，是中国轨道交通控制系统行业的领导者、全球领先的轨道交通控制系统提供商。公司拥有集轨道交通控制系统设计研发、装备制造及工程安装于一体的完整产业链，是全国轨道交通电气设备与系统标准化技术委员会通信信号分技术委员会（国家标准）、铁路行业电气设备与系统标准化通信信号分技术委员会（行业标准）秘书处单位，负责归口管理通信信号领域国家标准和铁路行业标准。

China Railway Signal & Communication Co., Ltd. (hereinafter referred to as CRSC) is a hi-tech service provider featured by railway signal and communication technology, the leader in China rail transit control industry, and an internationally leading rail transit system provider. We provide specialized one-stop solution of design and integration, equipment manufacturing and engineering installation for rail transportation control systems to our clients, and serve as the secretariat unit of the Communication Signal Sub-Committee of the National Technical Committee on Electrical Equipment and Systems for Railways of Standardization Administration of China (national standard) and the Communication Signal Sub-Committee of the Technical Committee on Electrical Equipment and Systems for Railway Industry of Standardization Administration of China (industry standard), responsible for the centralized management of the national standards in the field of communication signals and railway industry standards.

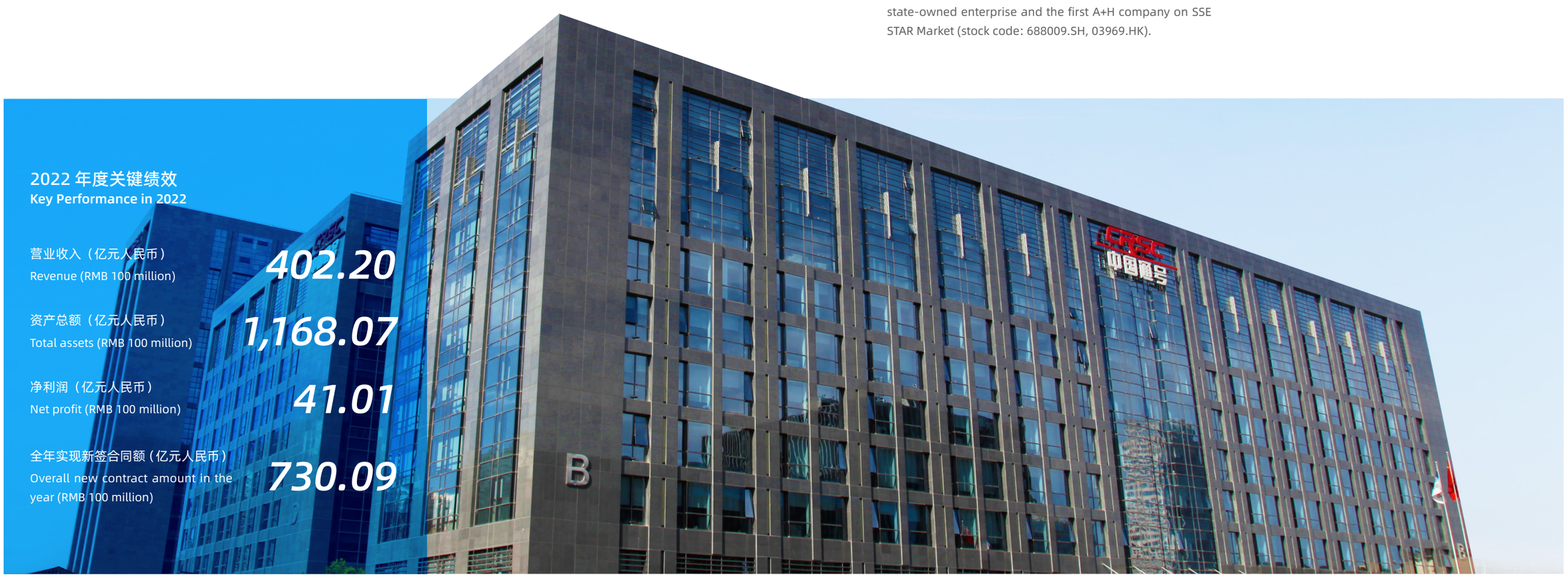
2015 年 8 月 7 日，公司成功登陆香港联合交易所。2019 年 7 月 22 日，公司在上海证券交易所科创板上市，成为登陆科创板的首家大型央企和 A+H 股的科创板上市公司（股票代码：688009.SH，03969.HK）。

On August 7, 2015, CRSC was successfully listed on HKEX. On July 22, 2019, CRSC was listed on STAR Market of Shanghai Stock Exchange (SSE), and became the first state-owned enterprise and the first A+H company on SSE STAR Market (stock code: 688009.SH, 03969.HK).

发展战略
Development Strategy

中国通号以“坚守主责、创新引领、突出主业、多元协同”为战略导向，实施“六核一体两翼”业务战略，构建“轨道交通 +N”产业格局，建设以轨道交通为特色、系统技术全球领先、综合实力世界一流的产业集团。

CRSC takes "adhering to main responsibilities, leading innovation, highlighting main business, and diversifying synergy" as the strategic orientation, implements the business strategy of "Six Cores, One Integration and Two Bases", creates a "rail transit + N" industrial pattern, and to build an industrial group with rail transit as its feature, global leading system technology and world-class comprehensive strength.



2022 年度关键绩效
Key Performance in 2022

营业收入（亿元人民币） Revenue (RMB 100 million)	402.20
资产总额（亿元人民币） Total assets (RMB 100 million)	1,168.07
净利润（亿元人民币） Net profit (RMB 100 million)	41.01
全年实现新签合同额（亿元人民币） Overall new contract amount in the year (RMB 100 million)	730.09

业务布局
Business Layout

中国通号以“六核一体两翼”赋能轨道交通产业，辐射壮大新兴产业，构建“轨道交通 +N”产业协同发展格局。

CRSC empowers the rail transit industry with its business strategy ("Six Cores, One Integration and Two Bases"), expands emerging industries, and creates a coordinated development pattern of "rail transit + N".

六核 Six Cores

信号（控制）系统、信息通信、电力电气化、工程总承包、投资运营、智能制造等六大核心业务协同发展

CRSC develops the six core businesses of signal (control) system, information and communication, electric power electrification, general contracting, investment and operation and intelligent manufacturing in a coordinated manner

一体 One Integration

设计研发、装备制造、工程安装全产业链一体发展

CRSC promotes the integrated development of the whole industrial chain of design and development, equipment manufacturing, and engineering installation

两翼 Two Bases

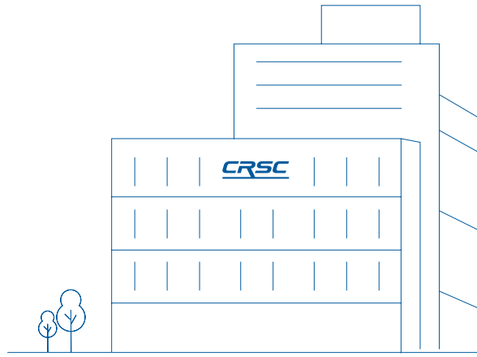
加强国际经营，推动国内、海外两大市场均衡协同发展

CRSC strengthens international operations and promotes the balanced and coordinated development of domestic and overseas markets

八大核心技术
Eight Core Technologies

- 中国高铁列控系统 (CTCS-3)
  China's Train Control System for HSRs (CTCS-3)
- 城市轨道交通列控系统 (CBTC)
  Train Control System for Urban Transit (CBTC)
- 中低速磁悬浮控制系统 (MATC)
  Train Control System for Medium and Low Speed Maglev (MATC)
- 铁路综合智能运行维护管理系统
  Integrated Intelligent Railway Operation Maintenance Management System
- 中国高铁自动驾驶系统 (CTCS-3+ATO)
  China's Automatic Train Operation System for HSRs (CTCS-3+ATO)
- 城际铁路列控系统 (CTCS-2+ATO)
  Train Control System for ICRs (CTCS-2+ATO)
- 货运编组站自动化系统 (CIPS)
  Automation System for Freight Marshalling (CIPS)
- 综合运输调度指挥系统
  Integrated Transportation Dispatching & Commanding System

企业文化
Company Culture



发展国家列控技术民族产业，引领全球轨道交通技术进步，守护人们美好出行。
Develop the National Industry with Train Control Technology, Lead the Technological Progress of Global Rail Transit, Guard People's Beautiful Travel.

使命愿景
Mission and Vision

以人为本 创新求进 安全至上 共创价值
People-Oriented, Innovation & Progress, Safety-First, Joint Value Creation

人是公司发展最大的资本。
CRSC advocates people-first approach.

自主创新是公司发展的动力。
Independent innovation is the momentum for CRSC's development.

质量安全是公司发展的基石。
Quality and safety are the cornerstones for CRSC's development.

创造价值是公司的矢志追求。
Value creation is the eternal pursuit of CRSC.

核心价值观
Core Values

求实 创新 拼搏 奉献
Realism, Innovation, Endeavor and Dedication

作风严谨，尊重科学，遵章守纪，追求实绩。
Rigorous attitude and scientific spirit, Compliance with regulation, Pursuit of results.

开放合作，勇于攀登，精益求精，追求卓越。
Openness and cooperation, Courage and efforts, Strive for perfection, Aspire for excellence.

泰而不骄，败而不馁，敢打硬仗，无私无畏。
Poised but not arrogant, Failed but not discouraged, Selfless and fearless.

恪尽职守，敢于担当，励精图治，产业报国。
Devoted and responsible, Ambitious and serve the country.

企业精神
Corporate Spirit

心之所往
弘扬责任文化

Listen to Our Heart and Carry forward the Culture of Responsibility

中国通号持续深化 ESG 管理，落实可持续发展理念，完善实质性议题识别和评估流程，完整、准确向内外部利益相关方传达中国通号 ESG 工作的最新进展，弘扬“求实、创新、拼搏、奉献”的企业精神，为跨越发展增添巨大动力。

CRSC has achieved leapfrog development by further deepening ESG management, moving towards sustainable development, improving processes for identification and evaluation of substantive issues, communicating CRSC's latest progress in ESG work to internal and external stakeholders completely and accurately, and carrying forward the corporate spirits of "realism, innovation, endeavor and dedication".

14 可持续发展理念
Sustainability Concept

15 可持续发展治理
Sustainability Governance

16 实质性议题识别
Identification of Material Issues

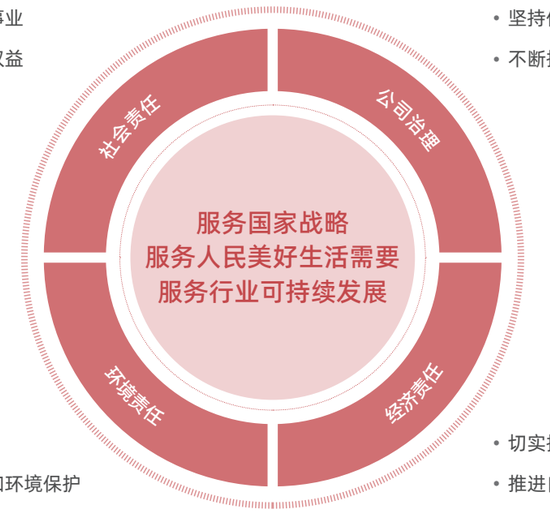
18 利益相关方沟通
Stakeholder Communication



可持续发展理念
Sustainability Concept

中国通号始终践行国家创新、协调、绿色、开放、共享五大发展理念，努力承担好企业在公司治理、经济、环境、社会等方面的责任，创造综合价值，服务国家战略、服务人民美好生活需要、服务行业可持续发展，促进企业与利益相关方共同成长。

Adhering to the five major development concepts of national innovation, coordination, green, openness and sharing, CRSC strives to shoulder corporate governance, economic, environmental and social responsibilities to create integrated value, and serve national strategies, people's needs for a better life and industrial sustainable development, so that the enterprise could grow together with its stakeholders.

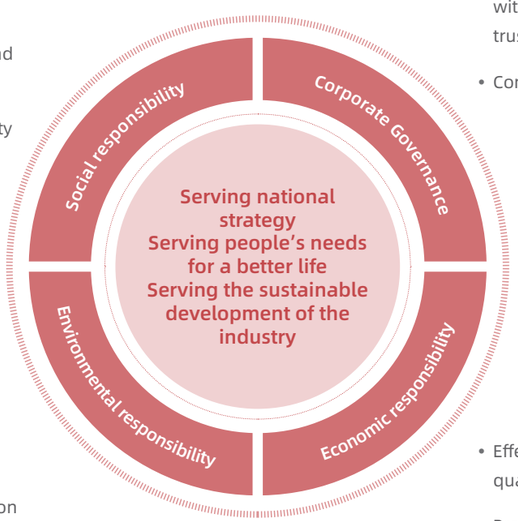


- 参与社会公益事业
- 维护职工合法权益
- 保障生产安全
- 坚持依法经营
- 不断提高盈利能力
- 加强资源节约和环境保护
- 切实提高产品质量和服务水平
- 推进自主创新和技术进步

可持续发展治理
Sustainability Governance

中国通号建立职责清晰的可持续发展和 ESG 管治体系，将 ESG 理念融入到公司发展战略和日常经营等全方位管理之中，保证公司 ESG 工作的具体落地。董事会对 ESG 工作负责，对 ESG 重大议题进行审议和决策，对本报告期的 ESG 相关工作进行建议和规划，持续监督管理层对 ESG 风险管理及内部监控系统的设计、实施及监察工作，有效控制 ESG 相关风险；公司总部各部门按照职能分工，负责业务范围内的 ESG 工作，积极推进可持续发展实践和 ESG 工作的正常开展。

CRSC has established a sustainable development and ESG governance system with well-defined duties and functions, integrating ESG concepts into its all-round management including development strategies and daily operations to ensure that the ESG work falls into place. The board of directors is responsible for ESG work, reviews and makes decisions on major ESG issues, makes recommendations and plans for ESG-related work in this reporting period, and continuously supervises the management's design, implementation and monitoring of ESG risk management and internal control systems to effectively control ESG-related risks. All departments at the headquarters are responsible for ESG work within their business scope according to the division of functions, and actively promote sustainability practices and regular ESG work.



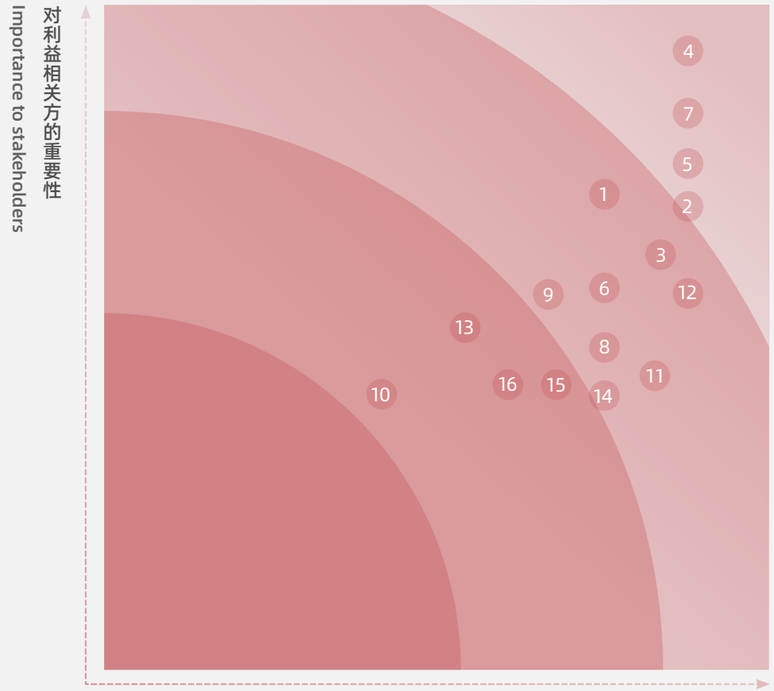
- Participate in social welfare undertakings
- Safeguard the rights and interests of employees
- Ensure production safety
- Insist on operating in accordance with the law and be honest and trustworthy
- Continuously improve profitability
- Strengthen resource conservation and environmental protection
- Effectively improve product quality and service level
- Promote independent innovation and technological progress

实质性议题识别
Identification of Material Issues

中国通号梳理宏观政策导向、研究分析 ESG 报告标准要求，结合公司发展战略、利益相关方关注议题，识别和建立公司 ESG 议题库；分析不同 ESG 议题对利益相关方的影响及对公司发展的重要性，开展实质性议题分析调研，从“对利益相关方的重要性”“对企业可持续发展的重要性”两个维度，建立实质性议题矩阵；相关分析结果呈报董事会讨论，并将相关反馈纳入可持续发展战略规划，分解到各部门执行。

CRSC studied the orientations of macro policies, explored and analyzed the standards and requirements of ESG reports. In combination with its development strategies and issues that arouse the attention of stakeholders, CRSC comparatively dissected the influence and the importance of different ESG issues on/to its development, conducted surveys on material issues, and assessed and prioritized material issues. The issues concerned and analytical results are shown below. These results were submitted to the Board of Directors for discussion and relevant feedbacks were incorporated into strategic plans for sustainable development, and then decomposed to various departments for implementation.

治理议题 Governance Issues	1. 守法合规	Legal compliance
	2. 廉洁从业	Practice of integrity
	3. 资产保值增值	Asset preservation and appreciation
经济议题 Economic Issues	4. 科技创新	Technological innovation
	5. 科技成果转化	Transformation of technological achievements
	6. 数字化与智能化	Digitalization and intelligentization
	7. 产品质量与安全	Quality and safety of products
	8. 优质服务	Quality service
	9. 供应链管理	Supply chain management
	10. 安全生产	Safe production
社会议题 Social Issues	11. 员工权益保障	Safeguarding employees' rights and interests
	12. 员工培养与职业发展	Employee cultivation and career development
	13. 社会公益	Social welfare
	14. 海外履责	Performing overseas responsibilities
环境议题 Environmental Issues	15. 节能减排	Energy conservation and emission reduction
	16. 应对气候变化	Tackling climate changes



利益相关方沟通
Stakeholder Communication

中国通号建立并完善多元沟通交流渠道，及时回应利益相关方的期望与关切，虚心倾听和接纳利益相关方意见和建议，及时传递公司动态，提高企业运行透明度，推动 ESG 工作走深走实，实现和谐共赢。

CRSC has established and improved multiple communication channels to respond to stakeholders' expectations and concerns in a timely manner, listen to and accept stakeholders' opinions and suggestions with an open mind, convey company dynamics in a timely manner, improve operational transparency, and promote the ESG work to go deeper and more practical, so as to achieve all-win harmony.

利益相关方类型 Stakeholders	政府机构 Government	股东与投资者 Shareholders and Investors	客户 Clients	员工 Employees	供应商 Suppliers	合作伙伴 Cooperation Partners	行业 Industry	环境 Environment	社区与公众 Community
期望与诉求 Expectations and Appeals	• 贯彻宏观政策 • 诚信守法经营 • 依法纳税 • 促进就业 • 带动地方经济发展 • To implement macro policies • To operate honestly and legally • To pay taxes according to law • To promote employment • To drive local economic development	• 良好的经营业绩 • 资产保值增值 • 信息合规披露 • 降低经营风险 • 股东权益保护 • Good operation performance • To preserve or add the asset value • To disclose information • To reduce operation risks • To protect the interests of shareholders and investors	• 合同履约 • 产品质量安全 • 提供优质服务 • 保障客户隐私 • To perform contracts • To guarantee product quality and safety • To offer premium service • To protect clients' information	• 保障员工权益 • 保障职业发展 • 员工生活关怀 • 保障薪酬福利 • 加强海外员工管理 • To protect staff interests • To clear the career development route • To offer staff caring • To offer rational salary and welfare • To enhance the management of overseas staff	• 诚信守法 • 阳光采购 • 扶持供应商成长 • 信息保密 • Integrity and law-abiding • To guarantee open, fair and legal procurement • To support suppliers' development • To keep information confidential	• 诚信守法 • 遵守商业道德 • 合作共赢 • Integrity and law-abiding • To abide by business ethics • To achieve win-win cooperation	• 公平竞争 • 科技创新研发 • 助力行业进步 • Fair competition • Technology innovation research • To promote the industrial development	• 遵守环境法律法规 • 践行节能减排 • 资源节约利用 • 环保意识提升 • To abide by laws and regulations of environment • To save energy and reduce emissions • To save resources • To improve the awareness of environment mental protection	• 参与社区建设 • 社会公益服务 • To take part in community construction • Public welfare activities
沟通方式 Communication Channels	• 工作汇报 • 参加会议 • 监督检查 • 信息报送 • Work report • Conferences • Supervision and inspection • Information reporting	• 企业定期报告及公告 • 业绩发布会 • 股东大会 • 投资者见面会 • 沟通汇报 • Corporate annual report, middle term report and announcements • Performance conference • General meeting of shareholders • Investors conference • Communication and reporting	• 客户拜访 • 客户满意度调查 • 电话、邮件、信件及在线反馈 • Clients visiting and communication • Satisfaction survey • Telephone, e-mail, letter, and on-line feedback	• 职工代表大会 • 员工培训宣教 • 日常沟通 • General meeting of staff representatives • Training and education • Daily communication	• 公开招标 • 开展合作 • 行业沟通与交流 • Open tendering • Carrying out cooperation • Industrial communication and exchanges	• 高层互访 • 定期沟通交流 • 协议合同执行 • High-level visit exchanges • Regular communication and exchanges • Execution of agreements or contracts	• 加强同业交流 • 参加行业论坛 • 考察互访 • Enhancing communication with peers • Industrial forums and conference • Research tours and visits	• 环保技术应用 • 环保理念宣贯 • 环境信息公开 • Application of energy saving technology • Publicity of environmental protection conceptions • Environmental information disclosure	• 社区沟通宣传 • 开展公益活动 • Community publicity • Organizing public welfare activities

信之所倚 夯实责任基础

Rely on Trust and Build a Firm Foundation of Responsibility

中国通号坚持以习近平新时代中国特色社会主义思想为指导，以高质量党建领航公司高质量发展，不断完善公司治理机制，加强董事会建设，践行合规运营、依法治企，提高反腐倡廉力度，充分保障股东和各相关方利益，实现公司长期、稳定和健康发展。

Adhering to the guidance of Xi Jinping Thought on Socialism with Chinese Characteristics for a New Era, CRSC leads high-quality development via high-quality Party building, constantly improves the corporate governance mechanism, strengthens the construction of the board of directors, practices compliant operations and law-based corporate governance, intensifies efforts to combat corruption for public integrity, and fully protects the interests of shareholders and all interested parties, to realize long-term, stable and healthy development.

22 公司治理，强基固本
Corporate Governance and Solid Foundation

28 合规管理，依法运营
Compliance Management and Law-based Operations

29 风险防控，筑牢防线
Risk Prevention & Control and Strong Defense against Risks

30 党建领航，行稳致远
Party's Leadership and Steady Progress

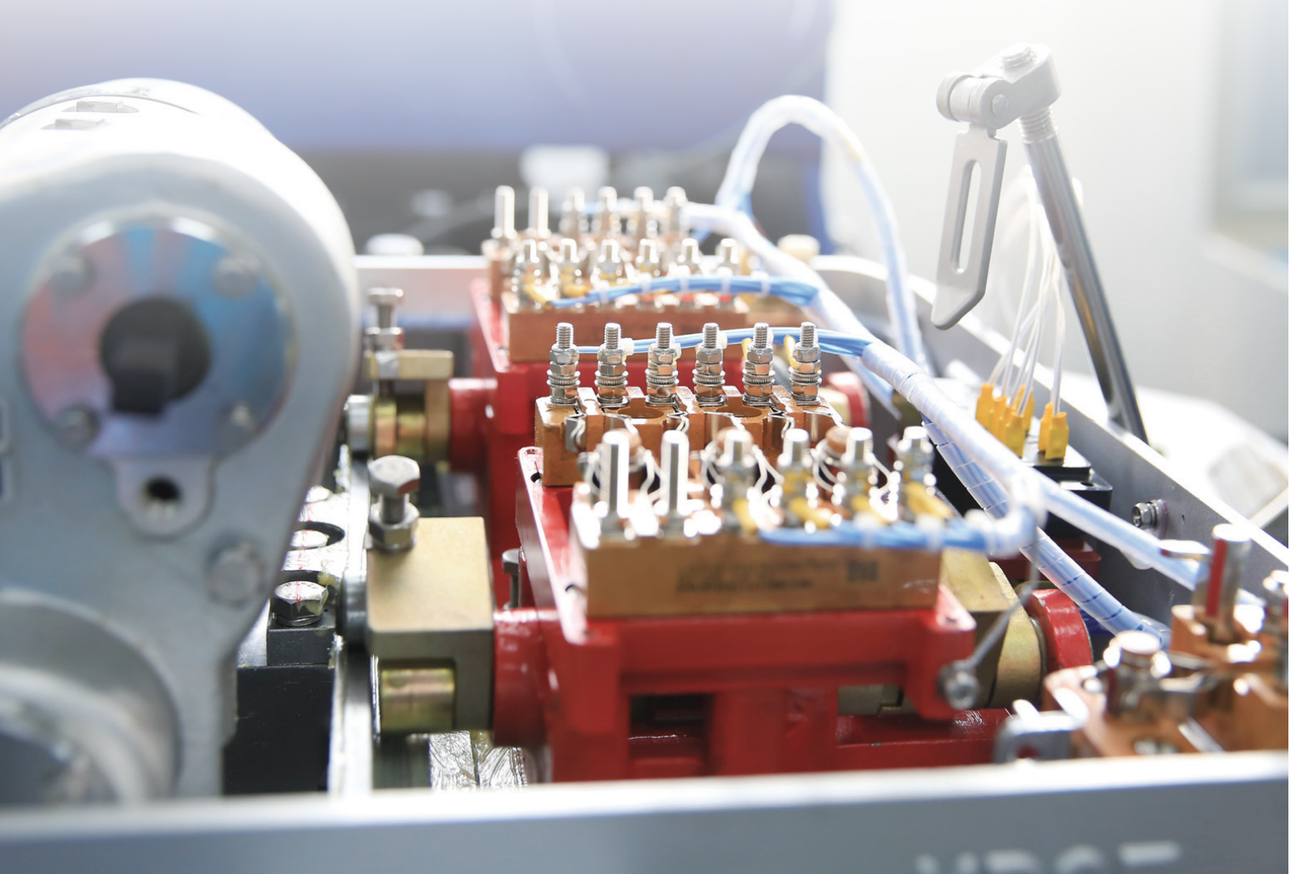
32 反腐倡廉，风清气正
Anti-corruption and Honesty & Integrity



公司治理，强基固本
Corporate Governance and Solid Foundation

中国通号严格遵守《公司法》《证券法》《上市公司治理准则》等法律法规及香港联合交易所、上海证券交易所各项规定，贯彻落实《关于进一步提高上市公司质量的意见》等文件精神，构建现代公司治理架构体系，制定科学有效的议事规则和工作程序，完善“三重一大”决策制度，推动董事、监事和高级管理人员依法履职，确保公司运行规范、运转协调。

According to the requirements of the Company Law of the *People's Republic of China, the Securities Law of the People's Republic of China,* the *Code of Corporate Governance for Listed Companies* and other laws and regulations, as well as the provisions of Hong Kong Stock Exchange and Shanghai Stock Exchange, and for the purpose of implementing the spirit of documents such as the *Opinions for Further Improving the Quality of Listed Companies*, CRSC set up a modern corporate governance architecture, formulated scientific and efficient rules of procedure and working processes, improved the "three majors and one big" decision-making system, and encourage directors, supervisors and senior managers to perform their duties according to law, so as to ensure legitimate and coordinated corporate operations.



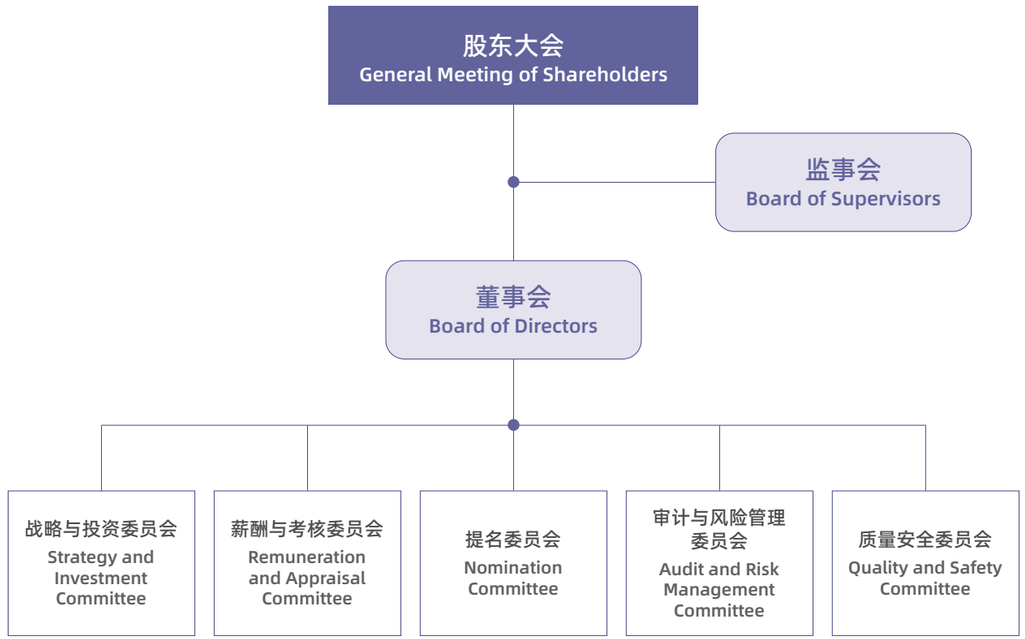
治理体系
Governance System

中国通号规范设立股东大会、董事会、监事会、经理层等法人治理体系，形成权责法定、权责透明、协调运转、有效制衡的公司治理机制，提高公司的规范运作水平。2022 年，公司召开股东大会 3 次、董事会会议 12 次、监事会会议 6 次。

CRSC has standardized corporate governance systems such as shareholders' general meeting, board of directors, board of supervisors and management level, forming a corporate governance mechanism that features statutorily-defined and transparent rights and responsibilities, coordinated operations, and effective checks and balances, and improving legitimate operations. In 2022, CRSC convened 3 general meetings of shareholders, 12 meetings of the board of directors and 6 meetings of the Board of supervisors.

董事会作为公司的决策机构，对股东大会负责，以维护出资人利益、实现国有资产保值增值为宗旨，依照法定程序和公司章程充分履行职责。董事会由 7 名董事组成，包括 3 名执行董事、1 名非执行董事、3 名独立非执行董事，实现董事构成多元化，保证决策的科学性。董事会下设战略与投资委员会、薪酬与考核委员会、提名委员会、审计与风险管理委员会和质量安全委员会 5 个专门委员会，为董事会决策提供咨询和建议。

The board of directors, as a decision-making body, is accountable to the shareholders' general meeting, and fully performs its duties in accordance with legal procedures and the Articles of Association, for the purposes of safeguarding the interests of investors and realizing the preservation and appreciation of state-owned assets. The board of directors consists of seven directors, including three executive directors, one non-executive director and three independent non-executive directors, so as to realize diversity and ensure scientific decision-making. The board of directors consists of five ad hoc committees: the Strategy and Investment Committee, the Remuneration and Appraisal Committee, the Nomination Committee, the Audit and Risk Management Committee and the Quality and Safety Committee, which give advice on making board decisions.



治理架构
Governance Framework

董事会
Board of Directors



周志亮
党委书记、董事长、执行董事
Zhou Zhiliang
Secretary of CPC, Chairman, Executive Director



徐宗祥
党委副书记、总裁、执行董事
Xu Zongxiang
Deputy Secretary of CPC, President, Executive Director



张权
党委副书记、执行董事
Zhang Quan
Deputy Secretary of CPC, Executive Director



姚桂清
独立非执行董事
Yao Guiqing
Independent Non-Executive Director



郭永宏
非执行董事
Guo Yonghong
Non-Executive Director



姚祖辉
独立非执行董事
Yao Zuhui
Independent Non-Executive Director



傅俊元
独立非执行董事
Fu Junyuan
Independent Non-Executive Director

高管团队
Top Management Team



李连清
党委常委、总会计师、董事会秘书
Li Lianqing
Party Committee Member, Chief Accountant, Secretary of the Board of Directors



赵晓东
党委常委、副总裁
Zhao Xiaodong
Party Committee Member, Vice President



姚希春
党委常委、纪委书记
Yao Xichun
Party Committee Member, Secretary of Commission for Discipline Inspection



张志辉
党委常委、副总裁、总工程师
Zhang Zhihui
Party Committee Member, Vice President, Chief Engineer



万宝华
党委常委、副总裁
Wan Baohua
Party Committee Member and Vice President

监事会
Board of Supervisors



孔宁
监事会主席
Kong Ning
Chairman of the Board of Supervisors

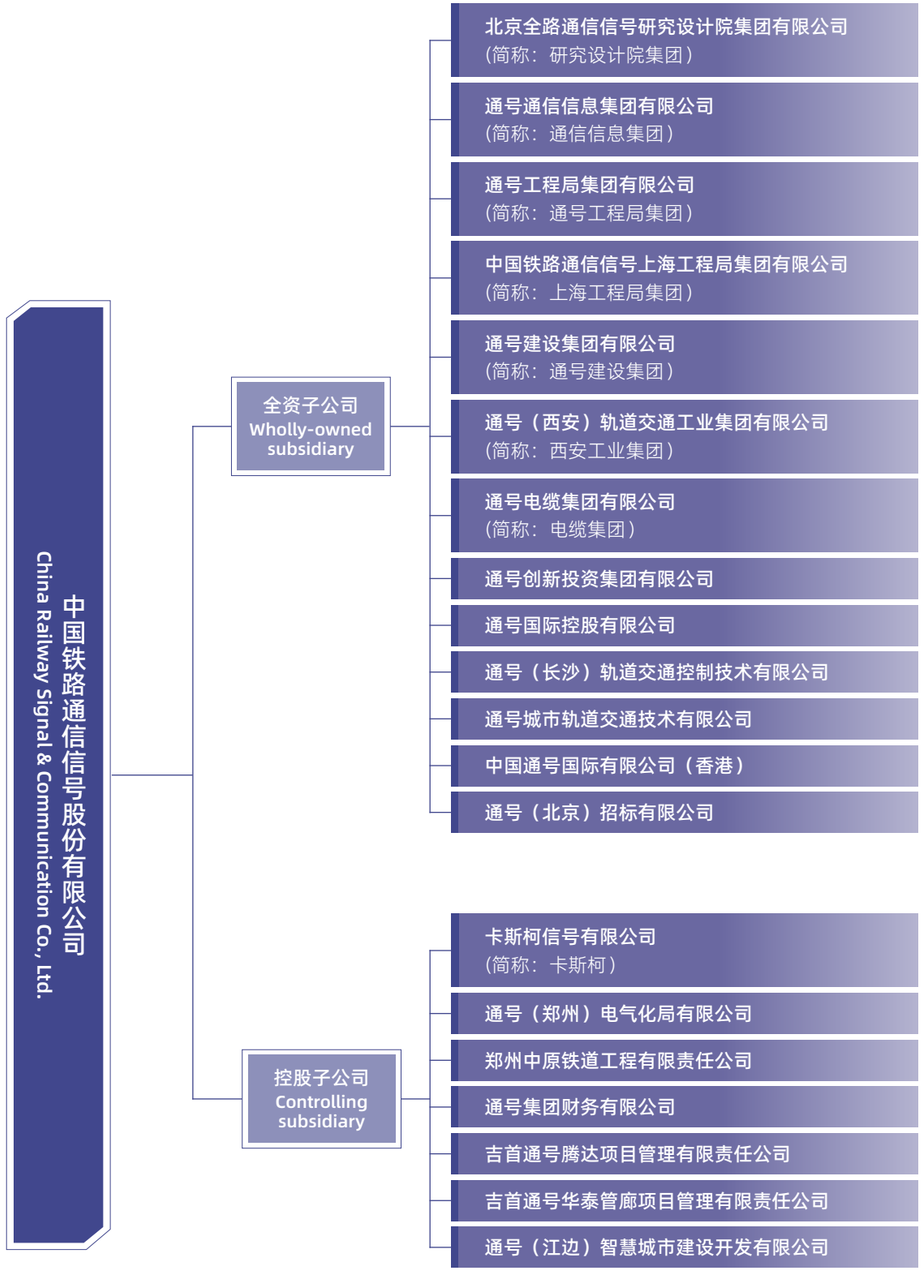


李铁南
股东代表监事
Li Tienan
Shareholder Supervisor



杨扬
职工代表监事
Yang Yang
Employee Representative Supervisor

组织架构
Organizational Structure



CRSC Research & Design Institute Group Co., Ltd. (Research & Design Institute Group)	
CRSC Information & Communication Group Co., Ltd. (CRSCIC)	
CRSC Engineering Bureau Group Co., Ltd. (Engineering Group)	
CRSC Shanghai Engineering Group Co., Ltd. (Shanghai Engineering Group)	
CRSC Construction Group Co., Ltd. (Construction Group)	
CRSC (Xi'an) Industry Group Co., Ltd. (Xi'an Industry Group)	
CRSC Cable Group Co., Ltd. (Cable Group)	
CRSC Innovation InvestmentGroup Co., Ltd.	
CRSC International Holdings Co., Ltd.	
CRSC (Changsha) Rail Transit Control Technology Co., Ltd.	
CRSC Urban Rail Transit Technology Co., Ltd.(Urban Rail Transit)	
CRSC International Co., Ltd. (Hong Kong)	
CRSC (Beijing) Bidding Co., Ltd.	
CASCO Signal Ltd. (CASCO)	
CRSC (Zhengzhou) Electrification Bureau Co., Ltd.	
Zhengzhou Zhongyuan Railway Engineering Co., Ltd.	
CRSC Financial Co., Ltd.	
Jishou CRSC Tengda Project Management Co., Ltd.	
Jishou CRSC Huatai Pipeline Project Management Co., Ltd.	
CRSC (Jiangbian) Smart City Construction Development Co., Ltd.	

合规管理，依法运营
Compliance Management and Law-based Operations

中国通号围绕建设世界一流企业目标，落实国资委合规管理工作部署，树立“合规从高层做起、全员主动合规、合规创造价值”的合规理念，统筹规划部署，聚焦合规管控关键，持续提升公司依法合规经营水平。

Centering on the goal of building a world-class enterprise, CRSC implemented the compliance management work deployment of the SASAC, established the compliance concept of "compliance starts from the top, all staff take the initiative to comply, and compliance creates value", planned the deployment as a whole, focused on the key of compliance control, and continued to improve the company's legal compliance management level.

系统打造法治合规能力
Systematically Build Legal Compliance Capacity

制定发布“十四五”法治合规工作实施方案，统筹谋划公司法治合规管理体系建设。制定发布《合规管理办法》《合规管理手册》等制度，形成四个层级、16 项制度构成的合规管理专项制度体系，夯实公司合规管理基础。

Formulate and issue the implementation plan of the "Fourteenth Five-Year Plan" legal and compliance work, and plan the construction of the company's legal and compliance management system as a whole. Formulate and issue the Compliance Management Measures, Compliance Management Manual and other systems, form a special compliance management system consisting of four levels and 16 systems, and consolidate the company's compliance management foundation.

系统推进法治合规工作
Systematically Promote the Work of Rule of Law and Compliance

开展全系统合规排查，全面识别各业务领域、管控流程、业务岗位等的合规风险，以依法合规经营为着力点，系统完善合规管控机制、流程。针对公司合规管理体系建设及运行情况，开展体系有效性和重点业务领域合规评价，进一步健全合规风险管控机制。

Carry out system-wide compliance troubleshooting, comprehensively identify compliance risks in various business areas, control processes, business positions, etc., and systematically improve the compliance control mechanism and process with the focus on legal compliance operation. According to the construction and operation of the company's compliance management system, carry out the system effectiveness and compliance evaluation of key business areas, and further improve the compliance risk control mechanism.

系统建设合规人员队伍
Systematically Build A Team of Compliance Personnel

在集团公司及全部子企业设立配备了首席合规官，健全公司全系统兼职合规管理员机制，开展公司全员签订员工合规承诺书和发放合规手册，开展全系统法治合规培训、宣贯，确保人人承诺合规，人人知晓合规。

Has set up the chief compliance officer in the group company and all its subsidiaries, improved the company's system-wide part-time compliance administrator mechanism, carried out the signing of employee compliance commitment letters and the issuance of compliance manuals by all the company's staff, and carried out system-wide legal compliance training, publicity and implementation to ensure that everyone commits to compliance and everyone knows about compliance.

法律审核率（企业规章制度、经济合同、重大决策的法律审核）（%）
Legal review rate (legal review of enterprise's rules and regulations, economic contracts and major decisions) (%)



风险防控，筑牢防线
Risk Prevention & Control and Strong Defense against Risks

中国通号始终将防范化解重大风险、优化内部管控、强化重大风险管控作为公司高质量发展的根本保障，将公司经营发展目标同风险防范化解工作全面结合，切实做到风险管理无死角、无漏洞、见成效。

CRSC has always taken prevention and resolution of major risks, optimization of internal control, and strengthening of major risk control and control as the fundamental guarantee for the company's high-quality development. CRSC has fully integrated the company's business development objectives with risk prevention and resolution, and effectively achieved no dead ends, no loopholes, and no results in risk management.

动态跟踪监测重大风险
Dynamically Track and Monitor of Major Risks

针对公司业务特点、所处行业特点，进一步健全针对性的风险量化监测指标，将风险监测向经营业务延伸。按季度组织公司全系统开展风险量化指标动态监测，进行动态分析和提示。

According to the characteristics of the company's business and industry, further improve the targeted quantitative risk monitoring indicators, and extend the risk monitoring to the business. Organize the company-wide system to carry out dynamic monitoring of risk quantitative indicators on a quarterly basis, and conduct dynamic analysis and prompt.

全面完善风险管控机制
Comprehensively Improve the Risk Control Mechanism

开展年度重大风险评估，对公司整体进行全面风险管控的“体检”，制定应对措施。针对境外业务，进行法律风险全面排查，完善境外风险排查处置机制。

Carry out annual major risk assessment, carry out "physical examination" of overall risk control of the company, and formulate countermeasures. For overseas business, carry out comprehensive investigation of legal risks and improve the investigation and disposal mechanism of overseas risks.

扎实推进内控体系建设
Solidly Promote the Construction of the Internal Control System

持续健全制度全生命周期管理机制，全面梳理分析公司规章制度，制定发布公司年度制度立改废计划并推进实施。全面梳理修订公司内控流程，针对每项流程增加相应的具体合规管控要求，进一步完善风险管控基础。

Continue to improve the management mechanism of the whole life cycle of the system, comprehensively sort out and analyze the company's rules and regulations, formulate and release the company's annual system reform and abolition plan and promote its implementation. Comprehensively sort out and revise the company's internal control process, add specific compliance control requirements for each process, and further improve the risk control basis.

党建领航，行稳致远
Party's Leadership and Steady Progress

中国通号深入学习宣传贯彻党的二十大精神和习近平总书记重要指示批示精神，坚决落实党中央、国资委决策部署，以高质量党建引领保障企业高质量发展，切实把党的制度优势转化为治理效能。

CRSC thoroughly studied, publicized and implemented the spirit of the 20th CPC National Congress and General Secretary Xi Jinping's important instructions, and resolutely implemented the decisions and arrangements made by the CPC Central Committee and the State-owned Assets Supervision and Administration Commission, so as to ensure high-quality development via high-quality Party building and effectively translate the Party's institutional strengths into governance efficiency.

党建引领，强化理论武装
Party's Leadership and Better Arming Ourselves with Theory

中国通号坚持把习近平新时代中国特色社会主义思想纳入党员教育培训“主修课”。公司党委领导班子成员坚持以身作则，带头深学细悟党的创新理论，通过党委理论学习中心组学习、班子成员深入研讨、考察调研、党委会“第一议题”等方式强化学习成效，巩固拓展党史学习教育成果。

CRSC insists on including Xi Jinping Thought on Socialism with Chinese Characteristics for a New Era in "major courses" for education and training of Party members. Members of the Party Leadership Group of CRSC lead by example to gain a deep understanding of the Party's innovation theory, reinforce their learning outcomes through good understanding of Party theories, in-depth discussion among the members, field study, and "First Issue" campaigns by the Party Committee, and consolidate and expand achievements in Party history learning and education.

学习宣贯，推动党的二十大精神入脑入心
Studying and Implementing the Spirit of the 20th CPC National Congress, Making It part of Our Heart and Mind

中国通号深刻认识党的二十大召开的重大意义，组织全系统党员干部收听收看开幕会直播；大会胜利闭幕后，公司党委第一时间召开专题会议、全面传达学习会议精神、印发学习宣贯工作方案，召开全系统动员宣讲会、在京企业党委书记座谈会、党代表分享会，推动党的二十大精神直达基层、直通一线；组织参观“奋进新时代”主题成就展，举办“奋进新征程 建功新时代”书画摄影篆刻作品征集，组织全国职工学习党的二十大精神知识竞赛中国通号集团专场赛，累计线上答题 22,698 人次，通过开展各类活动，实现党组织、党员全覆盖。

CRSC deeply recognizes the great significance of the 20th CPC National Congress and organizes party members and cadres throughout the system to listen to and watch the live broadcast of the opening meeting ; after the successful closing of the conference, the company 's party committee held a special meeting at the first time, fully conveyed the spirit of the learning conference, issued a work plan for learning and publicity, carried out a system-wide mobilization seminar, held a symposium of party committee secretaries in Beijing, and shared party representatives. The meeting promoted the spirit of the 20th CPC National Congress to reach the grassroots level and the front line; to organize a visit to the ' Endeavour New Era ' theme achievement exhibition, to hold a collection of calligraphy, painting, photography and seal cutting works of ' Endeavour New Journey to a New Era ', to organize the national staff to learn the 20th National Spiritual Knowledge Competition of the Party, the China General Number Group Special Competition, a total of 22,698 online answers, through various activities, to ensure the full coverage of party organizations and party members.



夯实基础，深化党建融合
Solid Foundation and Deep Integration of Party Building Work with Production and Operations

中国通号坚持大抓基层的鲜明导向，推进基层党建工作标准化、规范化，持续健全“一个支部一特色”“一名党员一面旗”的党建文化体系。深入开展“强活力、创佳绩、促增长”主题实践活动，各企业发挥自身优势打造了“夺冠”等一批竞赛活动，激发广大党员干事创业热情。总结完善主题党日、创岗建区等有效做法，“七一”期间开展特色实践、风采展示等活动。持续总结提升巩固党建品牌建设成果，聚焦党建融入生产经营找到切入点和发力点，形成以高质量党建引领保障企业高质量发展典型案例做法 39 个，组织基层选送党建创新案例 30 余篇，4 个党建创新案例被《国企党建》创新优秀案例集收录。

CRSC adheres to the clear orientation of grasping the grass-roots level, promotes the standardization of grass-roots party building work, and continuously improves the party building culture system of "each branch having its own characteristics" and "one Party member being viewed as one flag". We have carried out in-depth practical activities on the theme of " strong vitality, good performance and growth promotion. " Enterprises have given full play to their own advantages to create a number of competition activities such as " winning the championship " and stimulate the entrepreneurial enthusiasm of Party members and cadres. Summarize and improve the effective practices such as the theme party day, the creation of the post and the establishment of the district, and carry out activities such as characteristic practice and style display during the 'July 1' period. Continue to summarize and consolidate the achievements of party building brand building, focus on the integration of party building into production and operation to find the entry point and force point, form 39 typical cases of high-quality party building to lead and ensure the high-quality development of enterprises, organize grass-roots election and delivery of more than 30 cases of party building innovation, and 4 innovation cases of party building are included in the excellent case set of *Party Building* innovation in state-owned enterprises.

反腐倡廉，风清气正
Anti-corruption and Honesty & Integrity

中国通号夯实反腐败工作制度，严肃改革纪律，构建从管理人员到一线员工的全方位、立体化反腐败管理体系，营造风清气正的良好生态。2022 年，公司未发生腐败相关诉讼事件，未发生舞弊诉讼案件，人均反腐败培训 5.8 小时。

CRSC consolidates the anti-corruption work system, and seriously reforms disciplines to build an all-round and three-dimensional anti-corruption management system from managers to front-line employees, thus creating a sound political ecosystem featuring honesty and integrity. In 2022, no corruption-related and fraud-related lawsuits occurred in CRSC, and each employee averagely received 5.8 hours of anti-corruption trainings.

2022 年

人均反腐败培训

5.8 小时

In 2022, each employee averagely received 5.8 hours of anti-corruption trainings

扎牢制度笼子
Tighten Institutional Constraints

充分运用《廉洁风险防控工作手册》，严格执行《职工违纪违规处理规定》《深化整治“靠企吃企”问题九条禁令》等制度规定，强化廉洁风险防范和监督制约机制。

Make full use of the *Integrity Risk Prevention and Control Manual*, strictly implement the rules and regulations such as the *Provisions on Handling Employees' Violation of Disciplines and Regulations* and the *Nine Prohibitions on Deepening the Rectification of the Problem of "Making Private Profit from Their Own Game"*, and strengthen the integrity risk prevention, supervision and restriction mechanism.

完善党风廉政建设和反腐败工作协调小组工作机制，发挥基层党组织纪检委员作用，确保监督无死角。

Improve the working mechanism of the coordination group for improving Party conduct, building a clean and honest government, and combating corruption, and give play to the role of grass-roots Party organizations as members of the Central Commission for Discipline Inspection (CCDI), to achieve supervision with no dead ends.

严肃改革纪律
Seriously Reform Disciplines

加强改革风气监督，保障改革任务圆满收官。

Strengthen the supervision of reform culture to achieve successful conclusion of the tasks.

开展靠企吃企问题整治“回头看”，推动禁止性措施落实，坚决打击“靠企吃企”等腐败问题，持之以恒纠“四风”树新风。

Look back at the rectification of the problem of playing their own game and making private profit from CRSC, promote the implementation of prohibitive measures, resolutely crack down on corruption such as playing their own game and making private profit from CRSC, and correct "four bad practices" and foster healthy practices in a persistent way.

提升监督执纪质量
Improve the Quality of Supervision and Discipline

进一步完善《监督执纪工作手册》，及时开展案件质量和执纪安全监督检查，不断规范线索处置、审查审理等各项工作流程。

Continue to improve and make full use of *the Supervision and Discipline Enforcement Work Manual*, carried out timely safety supervision and audit on process quality and discipline enforcement to standardize various work processes such as clue disposal, review and trial.

深化以案为鉴、以案促改、以案促治，自主拍摄制作首部警示教育片《偏轨人生》，以身边事教育身边人。

Draw lessons from corruption cases handled to promote reform and governance. CRSC independently shot and produced the first educational film titled *Off-track Life* to learn from people and things around you.

健全信访举报程序
Strengthen Complaint Disposal Procedures

认真执行《纪检信访举报工作管理办法》，进一步完善信访举报的接收、分流、研判处置、交办件的检查督办、实名举报的处理、信访举报情况的综合运用、诬告陷害行为的查处等工作程序和机制。

Revise *the Administrative Measures for Disciplinary Inspection and Complaint Reporting* to further improve the working procedures and mechanisms for the reception, diversion, investigation and judgment and handling of petition reports, as well as the processing of real-name reporting and false accusation.

行之所至
书写责任担当

Take Actions and Manifest Corporate Social Responsibilities

中国通号坚定服务国家战略，深入践行企业使命和央企担当，坚持“创新驱动、自立自强”的发展精神，锻造卓越品质与服务，践行“双碳”目标，推动员工和行业和谐共赢发展，积极履行海外责任，用心回馈社会，以实际行动守护人们美好出行和幸福生活。

CRSC firmly serves national strategies, further practices its corporate mission and responsibilities as a central state-owned enterprise in depth, adheres to "innovation-driven development, self-reliance and self-improvement", forges excellent quality and service, achieves the "carbon peaking and carbon neutrality" goal, promotes harmonious and win-win development of employees and the industry, actively fulfills its overseas responsibilities, gives back to the society, and takes practical actions to protect people's happy travel and life.

36 创新驱动，赋能发展
Empower Development Driven by Innovation

47 匠心品质，服务客户
Provide Quality Service for Clients

54 绿色“双碳”，呵护生态
Protect Ecosystems through Green Development under "Carbon Peaking and Carbon Neutrality" Background

65 人才关爱，成就员工
Cherish Talents and Achieve Staff's Value

75 交流合作，携手共赢
Achieve a Win-win Situation through Exchange and Cooperation

82 乐于奉献，回馈社会
Contribute to the Society



创新驱动，赋能发展
Empower Development Driven by Innovation

中国通号把科技自立自强作为企业发展的战略支撑，以打造全球轨道交通控制技术的先行者和领导者为目标，全面提升创新创效能力，强化关键核心技术攻关，以科技驱动行业高质量发展。

Regarding self-reliance and self-improvement in science and technology as a strategic force for enterprise development, and aiming to become a global pioneer and leader in rail transit control technology, CRSC has increased innovation capacity and performance in all respects, and intensified efforts to achieve breakthroughs in core technologies in key fields, in order to drive the high-quality development of the industry through science and technology.

落实战略规划
Implementing Strategy

中国通号强化科技规划战略引领，制定“十四五”科技发展规划，确定科技创新目标和重点任务，进一步推动“一个体系、二个中心、三个高地、七大突破”的科技创新总体战略目标落实；积极统筹推进科技规划与所属公司战略规划、行业发展规划、企业年度行政重点工作的有效衔接，保障规划稳步落地，为科技创新工作高质量发展提供指南。

CRSC strengthened the strategic guidance of the science and technology plan, formulated the 14th Five-Year Plan for scientific and technological development, and determined the objectives and key tasks of S&T innovation to further promote the implementation of the overall strategic goal for S&T innovation of "One System, Two Centers, Three Highlands and Seven Breakthroughs". CRSC actively coordinated the effective connection between the science and technology plan and the subsidiary strategy plan, industry development plan and annual administrative priorities, to ensure steady implementation and provide guidance for high-quality development driven by S&T innovations.

提升创新能力
Enhancing Innovation Capabilities

中国通号坚持以创新变革开创工作新局面，实施“集中攻关”“揭榜挂帅”“成果孵化”“效益评估”等科技制度，凝聚和培养科技人才队伍，完善知识产权管理和保护，全力攻克指挥控制系统类、基础装备类等一批关键核心技术，多项技术达到世界领先水平，为公司实现高水平科技自立自强、引领轨道交通技术发展方向、巩固调度控制主业优势奠定坚实基础。

CRSC insists on creating a new situation through innovation-driven changes, implements S&T systems such as "concentrating efforts to achieve breakthroughs in core technologies in key fields", "enlisting and leading", "incubation of achievements" and "benefit evaluation", gathers and cultivates S&T talents, and improves intellectual property management and protection. CRSC has made concerted efforts to develop a number of core technologies in key fields such as command and control systems and basic equipment, many of which have reached the world leading level, laying a solid foundation for CRSC to achieve sci-tech self-reliance and self-strengthening at higher levels, lead the direction of development of rail transit technology, and consolidate the advantages of the main business based on dispatch control.

中国通号 2020–2022 年科技投入及承担科研项目情况
CRSC's Research Inputs and Scientific Research Projects in 2020-2022

指标 Indicator	单位 Unit	2020	2021	2022
年度研发投入 Annual Investment in R&D	亿元 RMB100 million	17.34	19.02	18.74
年度开展科研项目 Annual Scientific Research Projects	个 Pcs	825	772	806
承担国家级科研项目 National scientific research projects undertaken	件 Pcs	8	5	4
承担省部级科研项目 Provincial and ministerial research projects undertaken	件 Pcs	12	6	7
新增国家级奖励 New National Awards	项 Item	1	0	2
新增省部级奖励 New provincial and ministerial awards	项 Item	38	38	45

■ 构建创新平台
Building Innovation Platform

中国通号将创新平台视为集聚创新资源、汇聚创新力量的有效载体，形成领先的科技创新平台和示范格局。2022 年，公司新增国家级企业技术中心 1 家、创新基地 1 家、行业认定的研究中心 2 家。截至 2022 年底，公司共拥有 3 个博士后科研流动工作站、4 个院士工作站、12 个国家和行业创新平台、13 个国家级创新示范、30 余个省部级重点实验室 / 工程技术研究中心 / 工程实验室。

CRSC regards innovation platform as an effective carrier to gather innovation resources and forces, and forms a leading S&T innovation platform and demonstration pattern. In 2022, CRSC built one national enterprise technology center, one innovation base and two industry-accredited research centers. By the end of 2022, CRSC has 3 postdoctoral mobile stations, 4 academician workstations, 12 national and industrial innovation platforms, 13 national innovation demonstration titles, and over 30 provincial and ministerial key laboratories/ engineering technology research centers/ engineering laboratories.

中国通号 2022 年新增的重大创新平台
New Major Innovation Platforms Built by CRSC in 2022

国家级企业技术中心：
National Enterprise Technology Center:

- 西安铁路信号有限责任公司
  Xi'an Railway Signal Co., Ltd.

国家级创新基地：
National Innovation Base:

- “科创中国”轨道交通自主运行创新基地（中国科协批复）
  "Innovation China" Rail Transit Autonomous Operation Innovation Base (approved by China Association for Science and Technology)

行业认定的研究中心：
Industry-accredited Research Center:

- 电磁环境效应及电磁安全铁路行业工程研究中心
  Railway Industry Engineering Research Center for Electromagnetic Environment Effects and Electromagnetic Safety
- 高速铁路运行环境智能监控铁路行业工程研究中心
  Railway Industry Engineering Research Center for Intelligent Monitoring of High-speed Rail Running Environment

案例 Case 电磁领域深耕不辍，研究中心成功落户通号

CRSC Digs Deep into Electromagnetics and Research Center Settled in CRSC



2022 年 11 月，由研究设计院集团牵头申报的“电磁环境效应及电磁安全铁路行业工程研究中心”成功入选国家铁路局认定的铁路行业科技创新基地。该中心将立足铁路发展重大战略、重大工程需求，攻关轨道交通电磁干扰难题，聚集和培养轨道交通电磁人才，不断引领我国铁路行业科技创新。

In November 2022, the Railway Industry Engineering Research Center for Electromagnetic Environmental Effects and Electromagnetic Safety, led by Research & Design Institute Group, was successfully selected as one of the S&T innovation bases of railway industry accredited by the National Railway Administration of the People's Republic of China. Based on major railway development strategies and major engineering requirements, the center will solve electromagnetic interference (EMI) problems in rail transportation, gather and foster talents in electromagnetic fields of rail transportation, to lead the S&T innovation in China's railway industry.



西安工业集团西信公司被国家认定为企业技术中心

Xixin Company of Xi'an Industry Group is state-accredited as an enterprise technology center

知识产权研发与保护

Development and Protection of Intellectual Property

中国通号坚持知识产权研发与保护“双管齐下”，发明专利数量申请和授权持续保持高速增长，海外预警和布局能力不断增强，充分释放了专利红利，形成了较为完整的知识产权保护链和创新生态体系。截至 2022 年底，公司当前拥有有效授权专利 3,929 件，拥有发明专利 1,649 件；拥有海外授权专利 211 件；拥有软件著作权 1,793 项。2022 年 11 月，研究设计院集团荣获“国家知识产权示范企业”称号。

CRSC has adhered to the "two-pronged approach" - both intellectual property development and protection, so that the number of patent applications and authorizations has continued to grow at a fairly good clip, and the overseas early warning and layout capabilities have been enhanced, fully releasing the patent dividend and forming a relatively complete intellectual property protection chain and innovation ecosystem. By the end of 2022, CRSC has a total of 3,929 valid authorized patents, 1,649 invention patents, 211 authorized overseas patents, and 1,793 software copyrights. In November 2022, Research & Design Institute Group was awarded the title of "National Intellectual Property Demonstration Enterprise".

2020–2022 年中国通号新增专利情况

CRSC’s Newly Increased Patents in 2020-2022

指标 Indicator	单位 Unit	2020	2021	2022
新增授权专利 Newly Authorized Patents	件 Pcs	779	694	876
新增授权发明专利 Newly licensed invention patents	件 Pcs	256	337	591
新增申请专利 Newly Applied Patents	件 Pcs	1,055	1,204	1,339
新增申请发明专利 Newly Applied Invention Patents	件 Pcs	622	886	1,119
新增申请海外专利 Newly applied overseas patents	件 Pcs	80	118	142

科技人才建设

Construction of S&T Talents

中国通号把科技人才队伍建设摆在更加突出的位置，建立高质量培养和激励机制，念好“选、用、育、留”四字诀，有效激发公司创新创造活力。加强与詹天佑基金会的沟通，联合中国铁道学会通信信号分会设立詹天佑通信信号专项奖；积极开展各类专家推荐和“输出”工作，推荐工信部先进轨道交通产业领域、中国城市轨道交通协会等多名专家。截至 2022 年底，公司共有研发人员 4,428 人；新增 1 人入选国家科技部科技创新领军人才计划、3 人分获第十六届詹天佑成就奖和青年奖、2 人入选中国科协年度青年托举工程人才、10 人入选茅以升铁道工程师、1 人入选中国铁道学会推荐“最美铁道科技工作者”。

截至 2022 年底

公司共有研发人员

4,428 人

By the end of 2022, CRSC has a total of 4,428 R&D personnel

CRSC has given greater prominence to S&T talents by establishing a high-quality training and incentive mechanism and strengthening the "selection, adoption, cultivation and retention" which effectively stimulates innovation and creativity. CRSC strengthens communication with Zhantianyou Development Foundation for Science and Technology, and set up the Zhan Tianyou Special Award for researchers with the Communications Signal Branch of China Railway Society of China Railway Society. CRSC has actively carried out expert recommendation and "output", and recommended several experts from the advanced rail transit industry of the Ministry of Industry and Information Technology and the China Association of Metros. By the end of 2022, CRSC has a total of 4,428 R&D personnel, of which one person was selected into the Leading Science and Technology Innovation Talents by the Ministry of Science and Technology, three persons were respectively awarded the 16th Zhan Tianyou Achievement Award and Youth Award, two persons were selected into the annual Young Elite Scientist Sponsorship Program by China Association for Science and Technology, ten persons won the Mao Yisheng Railway Engineer Award, and one person was selected into "the Most Beautiful Railway Sci-Tech Workers" recommended by China Railway Society.

2022 年中国通号知识产权研发与保护工作进展
CRSC's Work Progress of the Development and Protection of Intellectual Property Rights in 2022

加快知识产权工作示范建设
Accelerate Intellectual Property Demonstration and Construction

- 1 家子企业获批国家知识产权示范企业称号，3 家子企业荣获国家知识产权优势企业称号，1 家企业获得高价值专利培育中心企业称号

  One subsidiary was awarded the title of "National Intellectual Property Demonstration Enterprise", three subsidiaries were awarded the title of "National Intellectual Property Advantage Enterprise", and one enterprise was awarded the title of "High-value Patent Cultivation Center Enterprise".

强化高价值专利培育
Strengthen the Cultivation of High-value Patents

- 积极推荐中国专利奖，2 件专利获第二十三届中国专利优秀奖，1 件专利获第四届上海市知识产权创新奖

  Recommended for China Patent Award, two patents from CRSC won the 23rd China Patent Excellence Award; and one patent won the 4th Shanghai Intellectual Property Innovation Award.

- 组织开展中国专利奖申报，通过多渠道申报 7 项中国专利奖项目

  CRSC organized application for China Patent Award, and its seven projects were filed with the China Patent Award through multiple channels.

推进知识产权体系建设
Promote the Construction of Intellectual Property System

- 2 家子企业通过国家标准 GB/T 29490-2013《企业知识产权管理规范》贯标认证

  Two subsidiaries are certified under the national standard titled *Enterprise Intellectual Property Management Standard* (GB/T 29490-2013).

创新成果转化应用
Transformation and Application of Innovation Achievements

中国通号充分发挥设计研发、装备制造和工程服务“三位一体”的综合优势，加快突破关键核心技术，加快实现重点技术在城市轨道交通、铁路信号安全控制等创新领域的“技术成果化、成果市场化、市场效益化”，推动一系列科技创新成果竞相涌现。2022 年，公司先后获得“国家制造业单项冠军示范企业”“国家级专精特新小巨人企业”等荣誉。

CRSC has vigorously leveraged the "three-in-one" advantage of design and development, equipment manufacturing and engineering services, and accelerated the research on core technologies in key fields, and realization of "technological achievements, marketization of results, and market efficiency" of key technologies in fields of innovation such as urban rail transit and railway signal safety control, contributing to the emergence of S&T innovation achievements. In 2022, CRSC won the National Single Champion Demonstration Enterprise in Manufacturing Industry and the National Specialized and New "Little Giant" Enterprise, etc.

2022 年中国通号科技创新成果应用（部分）
Application of CRSC's Scientific and Technological Innovation Achievements in 2022 (Partial)

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开展低真空管超高速磁浮运行控制系统研发，完成分区运控系统和舱载运控系统研究，山西大同 - 阳高超高速磁浮试验线进行现场试验。

CRSC carried out the research and development of ultra-high-speed low-vacuum pipeline maglev operation control system, and completed the research on partition operation control system and cabin load operation control system. The Datong-Yanggao ultra-high-speed maglev test line was field-tested in Shanxi Province.

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自主研发的 ETCS-2 级列控系统，符合欧盟互联互通标准及安全体系，在匈塞铁路塞尔维亚段正式开通运营，标志着全套中国自主知识产权的列控系统首次在欧洲国家应用。

The self-developed ETCS-2 train control system conforms to the interconnection & interoperability standards and safety systems of the European Union, and was officially put into operation in the Serbian section of the Hungary-Serbia Railway, marking the first time that China's full set of train control system with completely independent intellectual property rights was applied in Europe.

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自主化 CTCS-3 级列控系统无线闭塞中心 RBC 和 400T 车载设备分别实现商业转化，雅万高铁试验运行取得圆满成功。

The self-developed CTCS-3 radio block center (RBC) and 400T on-board equipment were commercialized, contributing to successful trial operation of Jakarta-Bandung High Speed Railway.

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攻克了双流制供电列车 ATO 全自动控车转换技术，实现列车在分相区和交直流转换区域的全自动切换，助力国内首条双流制式轨道交通线路重庆市郊铁路江跳线顺利运营载客。

The automatic train operation (ATO) technology for dual-powered trains was developed, and can achieve automatic conversion in dead zone and AC/DC transfer zone, which supports the operation of Jiang-Tiao Line, a suburban railway in Chongqing and also China's first dual-powered tram line.

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悬挂式永磁磁浮自主运行控制系统在江西省赣州兴国县红轨永磁磁浮示范应用。

The autonomous operation control system for suspended magnetic levitation was applied on a pilot basis to the Red Rail, a permanent maglev suspension train in Xingguo County, Ganzhou, Jiangxi Province.

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“超大规模地铁列控系统运维数字化转型关键技术及应用”顺利通过由院士领衔的专家组的评审，获得“国际领先”高度评价，并在上海陈太路运维中心、昆明线网中心试点应用。

The "key technology and application of digital transformation of operation and maintenance of ultra-large metro train control system" successfully passed the review of the expert group led by academicians. The project was highly rated as "international leading", and was applied on a pilot basis in Shanghai Chentai Road Operation and Maintenance Center and Kunming Metro Line Control Center.

案例 *Case* 新型列控系统，助力和若铁路顺利开通

New Train Control System Supports the Operation of Hotan-Ruoqiang Railway

2022 年 6 月，搭载中国通号新型列控系统的和若铁路顺利开通，极大改善了南疆交通运输条件，成为西部地区对外开放的重要通道，形成利用境外资源、开辟境外市场便捷的陆路大通道，有力推动地方经济发展和丝绸之路经济带建设。

Hotan-Ruoqiang Railway, equipped with CRSC's new train control system, opened in June 2022. It has greatly improved traffic conditions in southern Xinjiang, becoming an important channel for opening Western China wider to the outside world, and forming a convenient land route to utilize overseas resources and exploit overseas markets, which effectively promotes the local economic development and the construction of the Silk Road Economic Belt.

实现 1 项核心功能
1 Core Function

- 可适应国家铁路长大线路环境下基于机车牵引、由不同车长和不同载重条件客、货编组列车的紧追踪运行功能

  Adapt to the operations on the same track of locomotive-hauled freight/passenger trains with different lengths and load conditions under the background of long and large national railways

突破 2 项关键技术
2 Breakthrough Technologies

- 由车载设备综合北斗卫星定位、电子地图、速度传感器等多种信息源，自主感知确定列车位置

  The on-board equipment integrating Beidou, electronic map, speed sensor and other information sources can sense and locate the train automatically

- 综合卫星定位数据和列车风管空气压力数据，自主确认列车车体编组的完整性

  Confirm the integrity of train marshalling automatically, based on satellite positioning data and train duct air pressure data

具备 3 个突出特点
3 Outstanding Features

- 轨旁设备简约化

  Wayside equipment simplification

- 车站区间一体化

  Station-section integration

- 设备维护智能化

  Intelligent equipment maintenance



案例 *Case* 通号方案，助推国内首条双流制市郊铁路开通运行

CRSC's Solution Supports the Opening of China's First Dual-powered Suburban Railway

2022 年 8 月，重庆市郊铁路跳磴至江津线（简称“江跳线”）开通载客运营。中国通号为江跳线提供了全自主知识产权的 CBTC 信号系统解决方案，覆盖项目全生命周期服务，助力江跳线实现 120 公里每小时的最高运行速度，创造了重庆地区城市轨道交通运营最高运行速度的纪录，为实现重庆地区“四网融合”奠定坚实基础。

Tiaodeng-Jiangjin Line, a suburban railway in Chongqing (hereinafter referred to as Jiang-Tiao Line), opened to traffic in August 2022. CRSC provides Jiang-Tiao Line with a CBTC solution with completely independent intellectual property rights, which covers project life cycle services, so that Jiang-Tiao Line runs at a maximum speed of 120km/h, setting a urban rail speed record in Chongqing, and laying a solid foundation for realizing "four-network integration" in Chongqing.

首次实现双流制式下 ATO 精准停车

Realize accurate ATO parking under dual power system for the first time

首次实现基于云平台 ATS 系统的工程应用

Realize engineering application of cloud-based ATS systems for the first time

首次实现双线网互联互通 ATS 无感融合

Realize two-network-interconnected ATS non-inductive fusion for the first time



助推行业发展
Boosting Industrial Development

中国通号聚焦行业发展前沿，积极参与中国铁路通信信号领域行业标准制修订，持续加强与科研院所、行业协会等机构的技术交流互鉴，加大外部协同创新力度，充分汇聚各方智力资源，携手引领行业高质量发展和技术进步。

Focusing on the frontiers of industry development, CRSC actively participates in the formulation and revision of industrial standards on railway signaling in China, continuously strengthens technical exchanges and mutual learning with scientific research institutes, industry associations and other institutions, intensifies efforts to make innovation through collaboration with others, and fully pools intellectual resources from all sides, to jointly lead the high-quality development and technical progress of the industry.

行业标准制定
Formulating Industry Standards

中国通号积极组织和参与国际、国家、行业、团体、地方标准制定，主编的《同轴通信电缆 第 4 - 部分：辐射电缆分规范》(IEC 61196-4:2022)、《同轴通信电缆 第 4-1 部分：辐射电缆空白详细规范》(IEC 61196-4-1:2022)，参编的《轨道交通 铁路列车时刻表 第一部分：需求》(ISO 24675-1:2022)、《轨道交通 司机培训用驾驶模拟器》(ISO 23019:2022) 等国际标准正式发布，并牵头编制 4 项国际标准。

CRSC actively organizes and participates in the formulation of international, national, industrial, group and local standards. CRSC edited the *Coaxial Communication Cables - Part 4: Sectional Specification for Radiating Cables* (IEC 61196-4:2022) and the *Coaxial Communication Cables - Part 4-1: Blank Detail Specification for Radiating Cables* (IEC 61196-4-1: 2022). CRSC took part in international standards such as *Railway Applications - Running Time Calculation for Timetabling - Part 1: Requirements* (ISO 24675-1:2022) and *Railway Applications - Driving Simulator for Drivers' Training* (ISO 23019:2022) which were officially released, and took the lead in compiling four new international standards.

中国通号邀请中国工程院、国家市场监督管理总局、国家铁路局、国铁集团等 40 余家单位的专家、领导参加，成功召开全国轨道交通电气设备与系统标准化技术委员会通信信号分技术委员会（SAC/TC278/SC2）和铁路行业电气设备与系统标准化通信信号分技术委员会成立大会，以标准引领轨道交通通信信号产业高质量发展，彰显了公司行业凝聚力和标准引领力。截至 2022 年底，公司共归口管理现行有效国家和行业标准 196 项，在编标准 16 项。

Experts and leaders from more than 40 institutions, including the Chinese Academy of Engineering, the State Administration for Market Regulation, the National Railway Administration, China State Railway Group Co., Ltd., were invited to attend the inaugural meetings of the Communication Signal Sub-Committee of the National Technical Committee on Electrical Equipment and Systems for Railways of Standardization Administration of China (SAC/TC278/SC2) and the Communication Signal Sub-Committee of the Technical Committee on Electrical Equipment and Systems for Railway Industry of Standardization Administration of China to lead the high-quality development of the rail transit communication and signal industry by standards, demonstrating CRSC's industrial cohesion and leadership in standards. By the end of 2022, CRSC has managed a total of 196 prevailing national and industrial standards and 16 in-process standards.

截至 2022 年底

公司共归口管理现行有效国家和行业标准

196 项

By the end of 2022, CRSC has managed a total of 196 prevailing national and industrial standards

中国通号 2020-2022 年主参编国家及行业标准情况
CRSC's Participation in the Compilation of National and Industry Standards in 2020-2022

指标 Indicator	单位 Unit	2020	2021	2022
主参编国际标准 International standards	件 Pcs	0	0	4
主参编国家标准 National standards	件 Pcs	1	3	2
主参编行业技术标准 Industry standards	件 Pcs	9	9	5



2022 年 11 月，铁路行业电气设备与系统标准化通信信号分技术委员会成立

The Communication Signal Sub-Committee of the Technical Committee on Electrical Equipment and Systems for Railway Industry of Standardization Administration of China was established in November 2022



研究设计院集团副总工程师江明成功当选 IEC 国际标准召集人

Jiang Ming, deputy chief engineer of Research & Design Institute Group, was appointed as IEC convener

行业沟通交流
Industrial Communication and Exchanges

作为中国铁道学会通信信号分会的挂靠单位，中国通号鼎力支持通信信号分会创条件、搭平台、促服务，积极参加行业、协会交流论坛活动。联合申报中国科协全国学会分支机构示范发展专项，并入围全国 50 家学会示范分支机构发展专项支持；组织召开第九届轨道电路系统技术研讨会、中关村轨道交通国际创新创业大赛、全路道岔转换设备技术交流会等系列重大行业盛会；推动行业创先争优，中国铁道学会通信信号分会连续 3 年获得中国铁道学会分支机构考核第一名，荣获“优秀分支机构”荣誉称号，3 人获得优秀工作者称号。

As an affiliated institution of the Communications Signal Branch of China Railway Society, CRSC fully supports the Communications Signal Branch to create sound conditions, build platforms and promote services, and actively participates in industry and association forums. CRSC jointly applied for the demonstration and development fund established by China Association for Science and Technology for its branches nationwide, and was shortlisted for the demonstration and development fund support for 50 branches nationwide; held major events of the industry, such as the 9th Technical Seminar on Track Circuit System, Zhongguancun Rail Transit International Innovation & Entrepreneurship Competition, and China National Railway Turnout Switching Equipment Technology Exchange Conference, to promote the industry to create advancement and strive for excellence. The Communications Signal Branch of China Railway Society won first place in the performance evaluation of branches of China Railway Society for three consecutive years and was awarded the honorary title of "Excellent Branch", and three persons were awarded the title of "Outstanding Worker".

案例 Case **“创客北京 2022”中国通号 • 轨道交通通信信号行业专项大赛圆满收官** ▶▶▶

"Maker Beijing 2022" CRSC • Rail Transit Communication Signal Industry Special Competition concluded successfully

2022 年 8 月，“创客北京 2022”创新创业大赛中国通号 • 轨道交通通信信号行业专项赛决赛圆满收官。作为历经七年孵化出的双创大赛品牌，大赛主要面向前沿技术研究、产品研发、运用维护等轨道交通全产业链，重点聚焦高端装备和智慧服务两大方向，征集新技术、新产品与新服务，吸引了轨道交通相关企业及创新创业者的广泛关注和积极参与，共有来自全国 19 个省 270 余个项目报名参赛。

In August 2022, the final of "Maker Beijing 2022" CRSC • Rail Transit Communication Signal Industry Special Competition successfully concluded. As a brand of innovation and entrepreneurship competition that has been incubated for 7 years, the competition is mainly oriented to the whole industry chain of rail transit, such as cutting-edge technology research, product development, operation and maintenance, focusing on two directions of high-end equipment and intelligent service, and collecting new technologies, new products and new services. It has attracted wide attention and active participation of rail transit-related enterprises and innovative entrepreneurs. A total of more than 270 projects from 19 provinces across the country have signed up for the competition.

中国通号将以本次大赛为新起点，持续发挥行业技术引领和对产业链的带动作用，通过为中小企业和创新团队搭建交流展示、项目孵化和产融对接的服务平台，不断催生新产品、新技术、新模式和新业态，着力构建与中小企业协同创新、资源共享、融合发展的轨道交通产业生态，为交通强国和科技强国建设贡献力量。

Taking this competition as a new starting point, CRSC will continue to play the leading role of industry technology and the leading role of the industrial chain. By building a service platform for small and medium-sized enterprises and innovation teams to exchange and display, project incubation and industrial and financial docking, new products, new technologies, new models and new formats will be continuously spawned, and efforts will be made to build a rail transit industry ecology with collaborative innovation, resource sharing and integrated development with small and medium-sized enterprises, so as to contribute to the construction of a transportation power and a science and technology power.

匠心品质，服务客户
Provide Quality Service for Clients

中国通号秉持“质量是生命、安全大于天”的理念，持续优化产品质量，不断强化产品竞争力；主动贴近市场，打造一流服务竞争优势；大力推进数字化转型升级，锻造服务新优势；强化安全生产责任，守护本质安全，厚植企业高质量发展根基。

Adhering to the concept of “quality is life and safety of paramount importance”, CRSC has constantly optimized its product quality and enhanced product competitiveness; actively followed market trends, and built up its competitiveness in first-class services; endeavored to promote digital transformation and upgrade to form new advantages in service; strengthened the responsibility on safety production, ensured essential safety and consolidated the basis for the Company’s high-quality development.

卓越产品与服务
Excellent Product and Service

中国通号持续深耕质量管理。公司信守质量承诺，严格遵守《产品质量法》等法律法规，严格落实《质量管控规则》《产品质量检验工作管理办法》等制度规范，健全质量安全三级管控体系，从产品研发、设备制造、工程安装、集成调度、运营维护全产业链统筹质量管理，培育坚实的质量文化。

CRSC continued deepening quality management. The Company abode by its promises on quality, strictly followed the *Law on Product Quality* and other relevant laws and regulations, strictly implemented the *Rules on Quality Management and Control, Management Measures on Product Quality Control* and other systems and standards, improved its three-tiered management for quality safety, made overall arrangements for quality management covering the entire industrial chain including product R&D, equipment manufacturing, engineering installation, integration scheduling and operation & maintenance, and cultivated a solid quality culture.

同时，中国通号及所属企业紧密结合市场需要，深入挖掘客户需求，建立全生命周期的客户服务体系，积极回应客户关切，主动提供优质客户服务，充分保护客户隐私，及时妥善应对客户投诉，持续赢得客户满意。

In the meantime, CRSC and its affiliated enterprises adhered closely to the market demands, deeply explored the needs of client, established the full life circle client service system, actively responded to the concerns of client, actively provided quality services, fully protected the privacy of client, handled client complainants properly in a timely manner and won the continuous satisfactions of client.

中国通号 2020-2022 年客户服务绩效
CRSC's Client Service Performance in 2020-2022

指标 Indicator	2020	2021	2022
产品合格率（%）Product certification (%)	100	100	100
客户满意度（%）Customer satisfaction (%)	100	100	100
投诉解决率（%）Complaint solution (%)	100	100	100

中国通号全方位质量管理体系
CRSC Comprehensive Quality Management System

产品研发 Product R&D

明确关键质量控制点及控制要求，进行可靠性、安全性计算与分析，保证产品满足相应等级安全标准。

Specifying key quality control points and control requirements, conducting reliability and safety calculation and analysis, ensuring products meeting corresponding levels of safety standards.

设备制造 Equipment Manufacturing

出台《产品质量检验工作管理办法》，设立产品质量检验部门，完成产品入场、生产、出厂全流程的严格检验，建立产品质量检验档案，禁止不合格产品流出。

Issuing *the Management Measures for Product Quality Inspection*, setting up product quality inspection department, strictly inspecting the whole process of entry, production and delivery of products, establishing product quality inspection records, prohibiting the outflow of unqualified products.

工程安装 Engineering Installation

严格按照施工安装标准，加强施工安装过程安全分析和质量控制。

Strictly following construction installation standards, strengthening safety analysis and quality control during construction installation.

集成调试 Integration & Commissioning

提供产品检验、测试工作，识别并有效应对集成调试存在的管理与技术问题。

Providing product inspection and test, identifying and efficiently handling management issues and technical troubles existing in integration and commissioning.

运营维护 Operation & Maintenance

细化产品使用说明书及培训教材，制定安全管控措施。

Detailing product instruction manuals and training materials, formulating safety prevention and controlling measures.

2022 年，中国通号产品质量安全目标实现情况
Achievement of CRSC's Product Quality and Safety Goals in 2022

杜绝了生产安全一般及以上责任死亡事故、特种设备一般及以上责任事故、火灾一般及以上责任事故。

CRSC eliminated the "General-Level" or above accident of death, the "General Level" or above special equipment accident and the "General-Level" or above fire accident.

杜绝了铁路交通一般 C 类及以上责任事故、工程质量一般及以上责任事故、较大及以上质量问题。

CRSC eliminated the Category-C or above accident in railway traffic, the "General-Level" or above human element accident and "Severe Level" or above accident due to quality problems.

杜绝了职业病、职业中毒事件、突发环境事件。

It eliminated occupational diseases, occupational poisoning incidents and environmental emergencies.

实现了各检验批、分项、分部工程施工质量检验合格率 100%，单位工程一次交验合格率 100%，行业产品质量监督抽查合格率 100%。

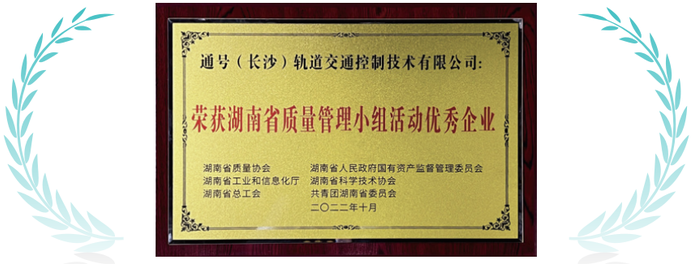
CRSC achieved a 100% quality inspection pass rate of each inspection batch, subitem and sub-project, a 100% engineering onetime delivery and acceptance pass rate, and a 100% quality supervision and inspection pass rate.

新研发的安全关键产品和城轨信号系统集成项目 100% 实行第三方安全评估，涉及安全关键产品的软件实行 100% 独立安全测试。

100% of newly developed safety critical products and urban rail signal integration systems were subject to third-party quality safety assessments, and safety critical products was subject to 100% independent safety testing.

保障了在轨系统设备安全运行，安全质量形势稳定。

CRSC continued to ensure the safe operation of on-track system equipment and realized the overall safety and quality of the continuous and stable situation.



通号轨道公司荣获“湖南省质量管理小组活动优秀企业”称号

CRSC (Changsha) Rail Transit Control Technology Co., Ltd. won the title of “Hunan Excellent Enterprise of Quality Management”

中国通号及所属企业全部通过 ISO9001 质量管理体系、ISO14001 环境管理体系以及 ISO45001 职业健康安全管理体系认证；工程建筑施工企业通过 GB50430 体系认证。

CRSC and its affiliated enterprises have all passed the certifications of ISO9001 quality management system, ISO14001 environment management system and ISO45001 occupational health and safety assessment series; engineering construction enterprises passed the certification of GB50430.

21 家所属企业完成国家安全生产标准化企业创建工作；17 家所属企业通过 IRIS 体系认证审核；5 家所属企业通过 CMMI 认证。

21 enterprises have completed the establishment of national standardization enterprises for production safety; 17 affiliated companies passed the IRIS system certification review; and 5 affiliated enterprises passed CMMI certification.

加强安全产品的安全认证工作，全年共完成 161 项安全认证。

CRSC strengthened safety certification of products and completed 161 safety certifications throughout the year.

数字化转型升级
Digital Transformation and Upgrade

中国通号全面加强数字化建设，加快主业版块多专业数据融合，利用人工智能、北斗通信、5G 等新一代信息技术，大力开展集成创新、技术创新，不断促进产品工艺设计、生产制造等方面的数字化管控，打造轨道交通行业领先生产制造力。

CRSC fully improved its digitalization, accelerated the integration of diversified data of its primary business, utilized the new generation of IT including AI, Beidou communication and 5G, greatly undertook integrated innovation and technical innovation, constantly promoted digital management and control in the areas of process design and production, and built up the advanced productivity in the sector of rail transportation.

2022 年中国通号数字化建设
CRSC's Digitalization in 2022

数字化车间
Digital Workshop

以 SAP 为基础，结合 MES、SRM 系统的实施，实现生产计划、物资采购、供应商管理的整合，实现供应商业务全流程及供货质量动态管理。

Based on SAP and integrated with the implementation of MES and SRM systems, realized integration between production plan, material purchase and supplier management and achieved the full-process management of supplier business and the dynamic management of supply quality.

智能柔性产线及装备
Intelligent Flexible Production Line and Equipment

应用单盒组装柔性生产线、智能料仓等智能化生产装备，提升产品生产制造、检验检测效率，大幅改善生产过程数据采集监测水平。

Adopted intelligent product equipment including the single-box assembly flexible production line and intelligent feed bin to enhance efficiency in product manufacturing and testing, and greatly improve collection and monitoring of production data.

城轨云测试平台
Urban Rail Cloud Testing Platform

满足城轨科研开发以及系统集成项目的调试测试需求，实现互联互通 CBTC 2.0 集成项目信号系统在云平台上的部署及测试应用，缩短实验室测试环境搭建时间。

Satisfied the needs for commissioning and test for the scientific research and development of urban rail and the projects of system integration, realized the deployment, testing and application of interconnected CBTC 2.0 integration project signal system on cloud platform, and shortened the time for building the environment for lab test.

城轨一体化绘图工具软件
Integrated Urban Rail Drawing Software

将传统工程数据表、联锁表等几十个工程设计文件进行整合，通过工具软件自动导入替代了传统的人工录入，大幅提高相关文档质量，有效减少了在产品生产过程中的多头输入问题。

Integrated dozens of engineering design documents including traditional engineering data table and interlocking table, which replaces traditional manual entry with automatic entry of software, greatly improves the quality of relevant documents and effectively reduces inconsistency from multi-entry during product manufacturing.

案例 Case **数字化运维实现高端核心装备自主可控**

Digital Operation & Maintenance Makes High-End Core Equipment Controllable

2022 年 7 月，卡斯柯基于数字化运维系统的“超大规模地铁列控系统运维数字化转型关键技术及应用”在上海地铁顺利通过专家评审。该项目在世界上首次实现了列控系统“状态修”，列控系统运行可靠度、列车正点率、全员生产率等技术指标均达到世界领先水平，每人公里运营成本世界最低，为我国城市轨道交通探索数字化转型提供成功经验和参考。

In July 2022, Casco's the “Key Technology and Application of Digital Operation & Maintenance of Super-large Scale Subway Train Control System” based on digital operation & maintenance system successfully passed the expert review in Shanghai Metro. The project first realized “condition based maintenance” for train control system in the world, with the technical indicators all reaching global leading levels including the operation reliability, punctuality and productivity of the train control system, making the operation cost per person kilometer to a global lowest level and providing successful experiences and references for the digital transformation of urban rail transportation in China.



保障安全生产
Ensuring Production Safety

中国通号深入贯彻习近平总书记关于安全生产重要论述和指示批示精神，严格遵守《安全生产法》《消防法》等安全法律法规，健全完善全员安全生产责任制，推进安全生产专项整治三年行动计划，加强安全风险防控，扎实开展安全应急演练，做好安全宣传培训，全力筑牢安全生产防线。

CRSC strictly implemented the important statements and instructions made by General Secretary Xi Jinping on production safety, strictly abode by the *Law on Production Safety, Law on Fire Control* and other relevant laws and regulations on safety, improved relevant responsibilities on production safety, carried out the three-year action plan on special rectification of production safety issues, enhanced prevention and control of safety risks, conducted safety emergency drill, promoted the publicity and training on safety and endeavored to consolidate the base for production safety.

安全生产管理
Safe Production Management

中国通号全面落实安全生产责任制，建立健全安全管理机构，成立以董事长为主任的安全生产管理委员会，定期召开安全生产委员会，研究部署安全生产相关工作。稳定运行安全生产标准化体系，有效落实安全生产责任，加强安全生产信息化建设，为维护好广大员工生命财产安全和公司高质量发展提供有力保障。2022 年，公司未发生安全生产一般及以上、重轻伤事故，未发生特种设备、火灾一般及以上责任事故，安全形势总体稳定。

CRSC fully implements accountability on safe production,establishes and improves the safety management organizations, and set up the safe production management committee with Chairman as the director to hold regular meeting and discuss and make arrangements for the works related to safe production. It steadily ran the standardized system of safe production, effectively implemented relevant responsibility on safe production, enhanced informationalization of safe production and provided strong supports for maintaining the life and property safety of employees as well as the high-quality development of the Company.

中国通号 2020-2022 年累计投入安全生产资金（亿元）
CRSC's Total Funds Invested in Safe Production in 2020-2022 (RMB100 million)



安全风险防控
Risk Prevention and Control of Safe Production

中国通号紧扣重大风险辨识管控、重大隐患排查治理两个关键领域，对安全生产实行分级分类管控，健全安全生产监督机制，开展安全质量隐患大排查大整治工作。加大监督检查频次和力度，各层级共组织检查 7,337 次，完成整改 15,857 项；开展三次全系统安全隐患大排查大整治，完成整改 3,314 项，有效遏制安全生产事故的发生；扎实推进安全生产专项整治三年行动收官工作，三年共发现问题 3,534 个，已全部整改，有效提升安全防控水平。

Sticking closely to the two key areas of identification and management of major risks and the troubleshooting and governance of potential hazards, CRSC implements tiered and classified management on safe production, improves the supervision mechanism on safe production and conducts general troubleshooting and rectification on potential hazards of safety and quality. It increased the frequency and thoroughness of supervision checking, with a total 7,337 checks conducted at different levels and 15,857 items rectified; conducted three general troubleshooting and rectification events on potential safety hazards covering the entire system and completed 3,314 items of rectification, which effectively prevented the accidents of safe production; strictly carried out relevant works to complete the three-year action on special rectification of safe production issues, with a total 3,534 problems spotted and rectified within three years, effectively improving the level on safety control.

安全生产应急
Emergency Management of Safe Production

中国通号持续加强事故应急管理，制定《轨道交通运营设备故障应急预案》《事故灾难综合应急预案》，建立完善的应急管理体系；加强应急值守，修订应急预案，针对春运、“两会”、国庆及党的二十大等关键时期，通过组织全系统实施在轨运营系统设备保障方案，有效保障轨道交通运营可靠安全；加大应急演练和评估工作，提升突发事件的处理能力。2022 年，公司组织开展火灾、触电、坍塌、机械伤害、高处坠落等应急演练共 501 次。

CRSC constantly improves its accident emergency management, formulates the *Emergency Preparedness Plan for Rail Transportation Operation Equipment Malfunction* and the *Comprehensive Emergency Preparedness Plan for Accident Disaster*, establishes a sound emergency management system, strengthens emergency guard to timely handle emergencies, modifies the emergency preparedness plan and organizes and implements the equipment support plan of on-rail operation system to effectively ensure reliable and safe operation of rail transportation during key periods such as the Spring Festival travel rush, “NPC&CPPCC”, the National Day holiday and the 20th CPC National Congress; and improves emergency drill and evaluations to enhance the handling capacity of emergency accidents. In 2022, 501 emergency drills such as fire, electric shock, collapse, mechanical injury and high-altitude fall were organized.

安全教育培训
Safety Education and Training

中国通号落实全员安全培训教育责任，广泛宣传安全生产法律法规，制定印发《安全生产教育培训管理办法》，组织“安全生产月”“安全生产法宣传周”、年度安全生产教育培训会等系列活动，建立员工安全培训教育档案，增强员工岗位安全操作技能和应急处置能力，营造浓厚安全氛围。

CRSC undertakes safety training and education for all employees, widely publicizes the laws and regulations on safe production, formulates and issues *the Management Measures on Education and Training on Safety Production*, organizes relevant activities including the “month of safe production”, “publicity week of the law on safe production” and the annual education and training meeting on safe production, establishes the files of safety training and education for employees, and enhances employees’ capacity in safe operation skills and emergency disposal to create a sound atmosphere of safety.

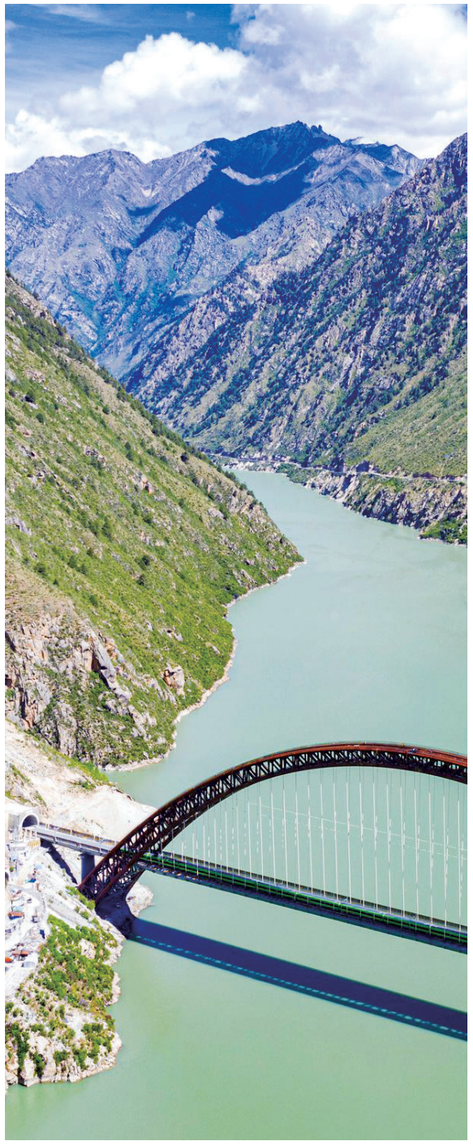


中国通号举办 2022 年度安全生产教育培训会
CRSC holds the 2022 Safe Production Education and Training Meeting

绿色“双碳”，呵护生态
Protect Ecosystems through Green Development under "Carbon Peaking and Carbon Neutrality" Background

中国通号以习近平生态文明思想为指导，提高能源资源有效利用率，积极妥善应对气候变化，减少温室气体排放，最大限度地减少污染物排放，助力实现“双碳”目标，助力建设天蓝、地绿、水清的美丽中国。

Guided by the thoughts of Xi Jinping on ecological civilization, CRSC improves the effective utilization of energy resources, actively copes with climate change in a proper manner, reduces emissions of greenhouse gas, reduces the discharge of pollutants to the minimum, and makes its own contributions to realizing the objectives of “carbon peaking and carbon neutrality” and to building the beautiful China with blue sky, green land and clear water.



节约能源资源
Saving Energy Resources

中国通号制定《节约能源与生态环境保护管理办法》，拟定各项能源消耗指标；加快淘汰高耗能、高污染的工艺装备，优先使用节能、高效、环保的设备和机具；提高各种机械的使用率和满载率，对大功率电器实行限流限时制度，最大限度节约用电；加快节能低碳新技术、新工艺、新产品的示范与应用推广，积极探索绿色制造体系；推进化石能源清洁高效利用，推动煤电向支撑性和调节性电源转型，积极有序推进煤炭替代和煤炭清洁化改造；积极促进包装材料减量化，持续减少不必要的包装，优先选用环保包材。

CRSC formulates the *Management Measures on Energy Conservation and Ecological Environment Protection*, and establishes several indicators of energy consumption; accelerates the elimination of skills and equipment with high energy consumption and pollutions, and prioritizes the use of energy-saving, efficient and environmental friendly equipment and tools; improves the utilization and full load rate of different machines, and implements current- and time-limiting rules on large power electric appliances to save electricity to the maximum; accelerates the demonstration and wide application of new technology, new technique and new product that’s energy-saving and low-carbon, and actively explores the green manufacturing system; promotes the clean and efficient utilization of fossil energy, and facilitates the alternative and clean transformation of coal power; actively reduces package materials, constantly decreases unnecessary packing and prioritizes the use of environmental friendly materials.

中国通号 2020-2022 年度制成品包装消耗量
CRSC's Packing Material Consumption for Finished Products in 2020-2022

包装材料类型 Packaging material type	生产制造包装用料 Manufacturing packaging materials			建筑工程包装用料 Engineering packaging materials	
	纸箱 Carton	木材 Timber	塑料 Plastic	塑料 Plastic	金属 Metal
	吨 Ton	吨 Ton	吨 Ton	吨 Ton	吨 Ton
2020	293.3	3,339.7	34.0	38.9	119.9
2021	247.5	2,800.9	27.4	20.9	455.3
2022	298.91	2,444.9	16.8	31.1	460.2

中国通号 2020-2022 年度能源资源消耗情况
CRSC's Energy and Resource Consumption in 2020-2022

能源类型 Energy type	电力 Electricity	液化气 Liquefied gas	汽油 Fuel	柴油 Diesel fuel	热力 Heating power	天然气 Natural gas
	兆瓦时 MWh	立方米 Square meter	吨 Ton	吨 Ton	百万千焦 MkJ	立方米 Square meter
2020	80,719.1	87,154.2	3,848.1	1,037.2	122,483.6	2,230,187.0
2021	109,700.0	74,883.0	3,800.1	1,606.3	86,601.8	2,952,281.6
2022	84,040.2	23,536.35	4,267.5	2,620.3	47,964.4	2,082,460.0

中国通号 2020-2022 年度能源资源消耗情况（续上表）
CRSC's Energy and Resource Consumption in 2020-2022 (Follow the above table)

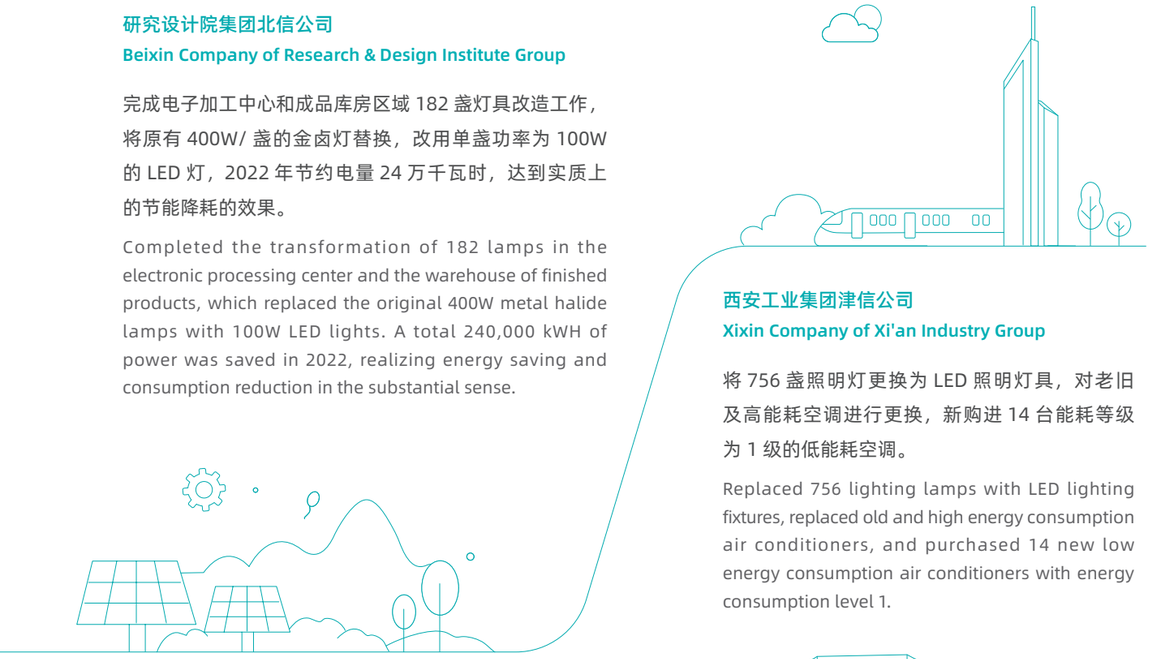
能源类型 Energy type	用水量 Water consumption	用水强度 Water consumption intensity	综合能源消耗量 Comprehensive energy consumption	综合能源消耗强度 Comprehensive energy consumption intensity
	吨 Ton	吨 / 万元 tons/RMB 10,000	吨标煤 tce	吨标煤 / 万元 tce/RMB 10,000
2020	1,093,600	0.27	41,130	0.01
2021	938,003	0.24	25,955	0.01
2022	887,390	0.22	24,830	0.01

中国通号所属企业节能行动（部分）
Energy Conservation Action of CRSC's Subsidiaries (Partial)

研究设计院集团北信公司
Beixin Company of Research & Design Institute Group

完成电子加工中心和成品库房区域 182 盏灯具改造工作，将原有 400W/ 盏的金卤灯替换，改用单盏功率为 100W 的 LED 灯，2022 年节约电量 24 万千瓦时，达到实质上的节能降耗的效果。

Completed the transformation of 182 lamps in the electronic processing center and the warehouse of finished products, which replaced the original 400W metal halide lamps with 100W LED lights. A total 240,000 kWH of power was saved in 2022, realizing energy saving and consumption reduction in the substantial sense.



通号电缆集团焦缆公司
Jiaolan Company of Cable Group

提高无功补偿装置功率因素，抑制谐波，及时跟踪拉丝、电缆、漏缆、光缆四个低压室的负荷情况，投切电容器补偿装置，功率因数始终保持在 0.96–0.99 之间。

Improved the power factor of reactive compensation device, suppressed harmonic, timely followed the loads of four low-voltage rooms of wire drawing, cable, leaky coaxial cable and optical cable, switched capacitor compensation device to maintain the power factor between 0.96 to 0.99.

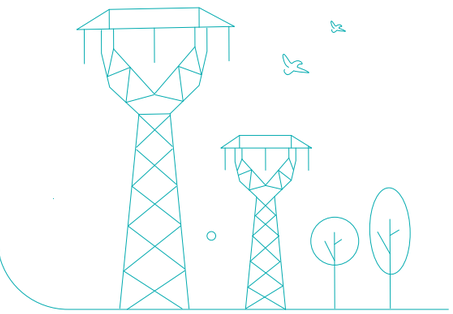
电费容改项目预计节约电费 32.5 万元。

Accommodated tariff based on demand is expected to save electricity bill by RMB 325,000.

西安工业集团津信公司
Xixin Company of Xi'an Industry Group

将 756 盏照明灯更换为 LED 照明灯具，对老旧及高能耗空调进行更换，新购进 14 台能耗等级为 1 级的低能耗空调。

Replaced 756 lighting lamps with LED lighting fixtures, replaced old and high energy consumption air conditioners, and purchased 14 new low energy consumption air conditioners with energy consumption level 1.



通号电缆集团天缆公司
Tianlan Company of Cable Group

将 S7-320 型号的变压器更新为 S11-315 节能型变压器，变压器升级改造后，变压器自身损耗（铜损、铁损）降低 40%。

Updated the S7-320 transformer to S11-315 energy-saving transformer and reduced the loss (copper loss or iron loss) of transformer by 40%.

温室气体减排
Reducing Emissions of Greenhouse Gases

中国通号认真贯彻落实《中共中央 国务院关于完整准确全面贯彻新发展理念做好碳达峰碳中和工作的意见》以及国资委《关于推进中央企业高质量发展做好碳达峰碳中和工作的指导意见》，不断完善长效机制，积极开展气候变化相关风险与机遇识别、“双碳”路径研究工作，持续降低温室气体排放，提升在应对气候变化相关议题上的治理表现。

CRSC strictly implements the *Opinions of the Central Committee of the Communist Party of China and the State Council on Completely and Accurately Implementing the New Development Concept and Doing a Good Job of Carbon Peak Carbon Neutralization* and the SASAC's *Guiding Opinions on Promoting the High-quality Development of Central Enterprises and Doing a Good Job of Carbon Peak Carbon Neutralization*, constantly improves the long-effective mechanism, actively identifies the risks and opportunities related to climate change, undertakes researches on the path of “carbon peaking and carbon neutrality”, constantly reduces the emission of greenhouse gases and improves its governance on relevant issues of climate change.

中国通号加快落实“双碳”工作的经济布局和结构，成立落实“双碳”工作领导小组和工作小组，编发《碳达峰行动方案》《节约能源与生态环境保护管理办法》；召开碳达峰碳中和工作推进视频会议，对“双碳”工作提出具体要求和部署；积极开展碳排放数据质量问题排查整治工作，杜绝碳排放数据弄虚作假作为，为落实碳达峰碳中和工作奠定基础。

CRSC accelerates the building of its economic layout and structure for implementing “carbon peaking and carbon neutrality”, establishes a leading team and working team in this regard, formulates and issues the *Carbon Peak Action Plan* and *Energy Conservation and Ecological Environment Protection*, holds the video conferences to promote carbon peaking and carbon neutrality works, proposes relevant concrete requirements and deployment in this regard, and actively conducts relevant examination and rectification of data quality issues relating to carbon emission to eradicate data fabrication and lay solid grounds for implementing carbon peaking and carbon neutrality.

中国通号坚持从源头减少二氧化碳排放，持续推进绿色低碳转型升级，提升绿电的使用比例，提高能源资源利用效率，降低单位产出能源资源消耗和碳排放；增强高质量绿色产品服务供给能力，加速绿色低碳新材料、新技术、新工艺推广应用。2022 年，中国通号温室气体（二氧化碳）排放量为 74,039 吨[1]，公司进一步规范了对二氧化碳的统计计算，将工程施工企业、设计研发集成等非工业企业全产业链生产过程产生的二氧化碳纳入统计范围，包括化石能源燃烧、购入电力、热力蕴含的二氧化碳排放量。

CRSC sticks to reduction of carbon dioxide from the source, continuously promotes green and low-carbon transformation and upgrade, improves the usage of green electricity, enhances the utilization of energy resources, reduces energy consumption and carbon emission per unit output, enhances the service supply capacity of high-quality green products, and accelerates the promotion and application of green and low-carbon new materials, new technologies and new techniques. In 2022, CRSC's emission of greenhouse gas (carbon dioxide) was 74,039 tons[1]. The Company further standardized the statistics and computation of carbon dioxide to include that generated from the production of the entire industrial chain of non-industrial enterprises such as engineering construction enterprises and design, R&D and integration enterprises, which specifically includes the emission of carbon dioxide contained in combustion of fossil fuel, purchase of electricity and thermal power.

注 1：本公司温室气体排放参考《2006 年 IPCC 国家温室气体清单指南》《企业温室气体排放核算方法与报告指南发电设施（2021 年修订版）》等文件排放因子，进行统计核算。

Note 1: For CRSC's greenhouse gas emissions, please refer to *2006 IPCC Guidelines for National Greenhouse Gas Inventories and Guidelines for Accounting Methods and Reporting of Greenhouse Gas Emissions by Enterprises Power Generation Facilities (revised in 2021)*.

温室气体减排措施
Greenhouse Gas Emissions-reduction Measures

绿色研发
Green R&D

- 开展绿色环保技术科研项目攻关，优选低能耗的工艺装备，把控减碳源头

  Tackle key issues of the scientific research project of green and environmental technology, prioritize the technique and equipment with low energy consumption and control the source for carbon reduction

- 研发绿色出行解决方案，以技术优化减少碳排放

  Develop green travel solutions, and facilitate low-carbon emissions through technological optimization

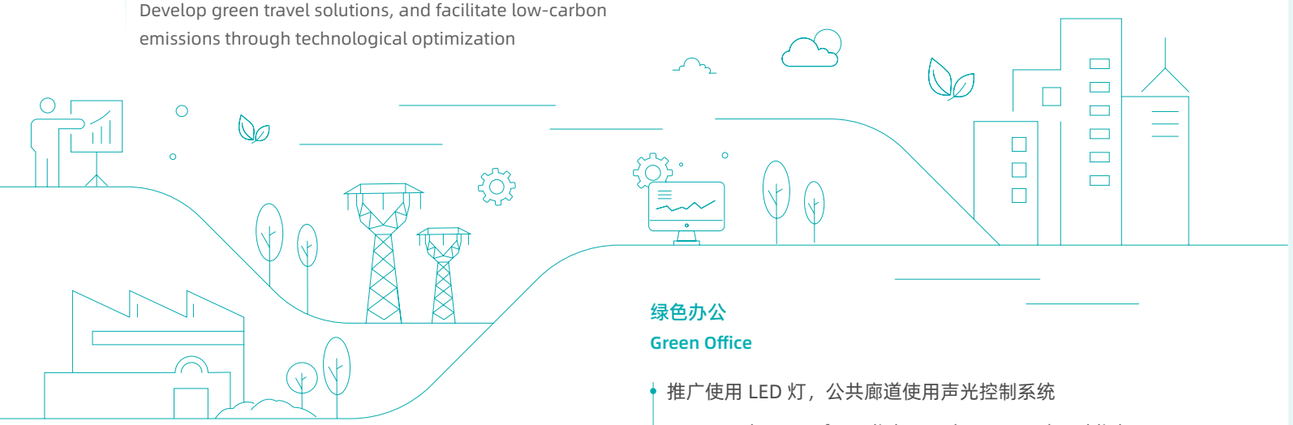
绿色工程
Green Engineering

- 建立工程建设项目环保管理制度，规范能源资源使用

  Establish an environmental protection management system for construction projects and standardize the use of energy resources

- 推进绿色采购和供应商管理，优先选用节能、环保产品

  Promote green purchase and supplier management and prioritize energy-saving and environmental products



绿色制造
Green Manufacturing

- 开展绿色信用体系创建活动。研究设计院集团北信公司获得“四星级绿色信用企业”称号。

  Hold the green credit system building activity. Beixin Company of Research & Design Institute Group won the title of “Four-Star Green Credit Enterprise”.

- 启动“绿色工厂”评价资质的创建工作。西安工业集团西信公司取得省级绿色工厂认证，申报的国家级绿色工厂通过了公示。

  Initiate the qualification evaluation of “green factory”. Xixin Company of Xi'an Industry Group won the certification of provincial green factory, and the national green factory it applied for passed the publicity.

绿色办公
Green Office

- 推广使用 LED 灯，公共廊道使用声光控制系统

  Promote the use of LED lights and use sound and light control systems in public corridors

- 采用更集约的空调系统、控制空调运作时间

  Adopt more intensive air-conditioning system and control the operation time of air-conditioning

- 倡导无纸化办公、纸张重复利用

  Promote paperless office and paper reuse

- 车库照明在保证正常亮度的前提下，关闭多余光源

  Turn off excessive lights when the garage is adequately and properly lit up

- 及时关闭非必要照明排风、显示器、采光灯、开水炉等

  Timely turn off unnecessary lighting, ventilation system, displays, lighting lamps, boilers and other systems

中国通号所属企业“双碳”行动（部分）
CRSC's "Carbon Peaking and Carbon Neutrality" Action (Partial)

卡斯柯
Casco

重点进行全自动互联互通 ATP/ATO 系统开发。针对线路潮汐客流、高峰和平峰客流数量差别较大的新特点，重点研究和开发 TRANAVI 系统互联互通全自动运行列车的动态联挂解编功能，以实现不同线路之间列车的资源共享，达到线路运能的动态部署和灵活调度，提高列车满载率，降低车辆年行走公里，在满足乘客出行的同时实现节能降碳。

Mainly developed the fully automatic and interconnected ATP/ATO system. Regarding the new characteristics of larger difference in passenger flow during tide, peak and flat hours, mainly researched and developed dynamic linking and unlinking function of TRANAVI system for interconnected automatically operating trains to realize resource sharing among trains of different lines, realize dynamic deployment and flexible scheduling of carrying capacity of different lines, improve full load rate and reduce idle miles of trains, and achieve energy saving and carbon reduction while satisfying the travel needs of passengers.

西安工业集团津信公司
Xixin Company of Xi'an Industry Group

初步建成智能工业大数据管理系统，能实时监测电气线路温度异常、电流过载、过压、欠压，和电力监控等，可实现对园区主要变配电设施及主要用电设备的能耗监测、用电安全监测等，以智能化支撑公司碳减排。

Preliminarily built up the intelligent industrial big data management system which can monitor abnormality in temperature of electricity lines, current overload, over-voltage, under-voltage and electric power, and realize the monitoring of energy consumption and electricity safety of primary facilities for power transformation and distribution and main electric equipment within the park, supporting carbon reduction in an intelligent manner.

通号工程局集团建设公司
Construction Company of CRSC Engineering Group

开展《屋顶太阳能光伏支架刚性和柔性组合安装》《平屋顶光伏施工技术研究》等科研课题的攻关，加快推广绿色低碳技术。

Undertook researches on key scientific topics such as the *Rigid and Flexible Mounting of Solar Panel Brackets on Roof* and *Research on Photovoltaic Construction Technology on Flat Roof*, to accelerate the promotion of green and low-carbon technology.

通号建设集团
Construction Group

发挥装配式建筑在资源节约方面的优势，利用 BIM 技术对模板进行合理分块拼装，提高二次利用率，通过合理 PC 构件拆分，实现构件标准化，节约模板损耗和周转费用。

Gave play to the advantages of prefabricated building in saving resources, utilized BIM technology to properly divide and assembly different modules to improve recycling and through proper division of PC parts, realized standardization of PC parts and saved module loss and transfer expenses.

通号工程局集团城建公司
Urban Construction Company of CRSC Engineering Group

《郑万高铁平顶山西站东广场及配套基础设施工程施工阶段 BIM 技术应用》《BIM 技术在长治高新区太行数据湖科技文化产业项目 EPC 总承包施工中的应用》在第三届“智建杯”国际智慧建造创新应用大奖赛中分别荣获金奖、银奖。

The *Application of BIM Technology in Construction of Zhengzhou-Chongqing High-speed Railway Pingdingshanxi Railway Station East Square and Supporting Infrastructure*, and the *Application of BIM Technology in EPC Construction of Changzhi Hi-tech Industrial Development Area Taihang Data Lake Technological and Cultural Industry Project* won the Golden and Silver Awards respectively at the 3rd International Smart Construction Innovation Awards.

减少污染排放
Reducing Discharge of Pollutants

中国通号大力执行建设项目环境影响评价，加大源头管控，开展环境监测，严控生产过程“三废”排放，实施噪声污染防治行动，改良工艺装备，确保污染物达标合规排放。2022 年环境检测显示，废气、噪声排放达标率达 100%，废弃物合格处置率达 100%。

CRSC vigorously carries out environmental impact assessment for construction projects, improves control at the source, conducts environmental monitoring, strictly controls the discharge of “three wastes” during production, implements the prevention and treatment action on noise pollution, and improves relevant techniques and equipment to ensure compliant discharge of pollutants. In 2022, according environmental monitoring, the qualification rate of waste gas and noise discharge reached 100% and disposal rate of wastes 100%.



通号工程局集团使用小型新能源喷洒车，减少扬尘污染

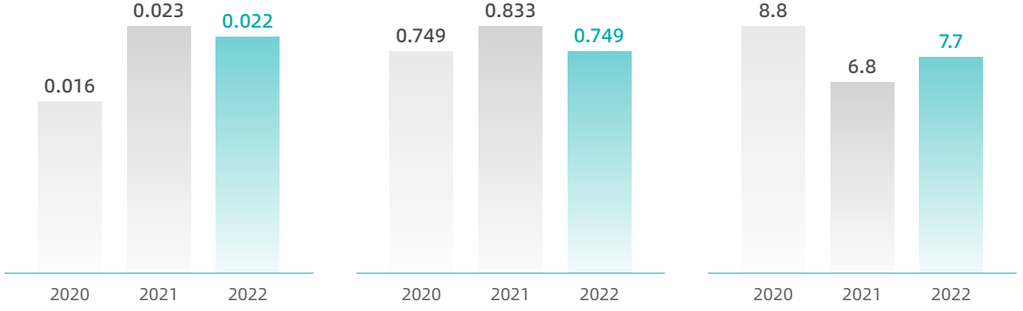
Engineering Group adopted small NEV spraying vehicles to reduce dust pollutions

治理类型 Type	废气治理 Waste Gas Treatment	废水治理 Wastewater Treatment	废弃物治理 Solid Waste Management	噪声治理 Noise Treatment
典型措施 Measure	• 委托有资质的第三方检测机构定期进行指标检测 Entrust a qualified third-party testing organization to test relevant indicators on a regular basis • 按照《挥发性有机物无组织排放控制标准》的要求，对生产过程中产生的挥发有机物加强治理 Strengthen treatment on volatile organic compounds generated during production as per the requirements of Volatile Organic Compounds Unorganized Emission Control Standard • 引进高效治理设施，加装 VOCs 等废气收集处置装置 Introduce efficient treatment facilities and install VOCs and other devices to collect and dispose waste gas	• 雨污分流，严格管控生产及生活废水排放 Separate rain from wastewater and strictly control the discharge of production and household wastewater • 加大循环利用，配置污水处理系统，集中处理达标后统一排放，开展水质污染物自行监测与第三方抽检 Improve recycled utilization, establish the wastewater treatment system for integrated treatment and qualified discharge, and conduct self monitoring and third-party spot checking of water pollutants	• 实现一般工业固废分类收集、及时转移、合规处置，加大固废回收和循环利用 Realize classified collection, timely transfer and compliant treatment of general industrial solid wastes and improve collection and recycling of solid wastes • 定期收集并规范处理办公垃圾、建筑垃圾、包装材料等一般废弃物 Collect and dispose general solid wastes in a regular and standardized manner including office waste, construction waste and packing materials • 分区存放，由有资质的第三方妥善处理危险废弃物 Store in different areas and let the qualified third party treat hazardous wastes properly • 开展全员宣传教育，推行垃圾分类 Undertake public propaganda and education and promote waste classification	• 采取隔声、吸声、减震以及低噪声设备等综合措施，改善降噪工艺 Adopt comprehensive measures to improve noise reduction including insulation, absorption, damping and low-noise equipment • 采购专业噪声测试仪，开展厂界噪声检测 Purchase professional noise-measuring instrument to test noises within the factory
典型企业 Enterprise	**西安工业集团沈信公司**投入 47.3 万元，在零件车间磁钢喷漆工序和电子车间三防涂覆生产线实施两个废气治理项目，采用活性炭过滤治理方法，对废气治理设施进行改造。 **Shenxin Company of Xi'an Industry Group** invested RMB 473,000 to implement 2 projects for treating waste gas generated in magnetic steel painting process of the parts workshop and the conformal coating production line of the electronic workshop, which adopt the filtering treatment of activated carbon to transform waste gas treatment facilities.	**研究设计院集团北信公司**投入资金 55 万，对污水站设施提标改造，改造后的污水处理设备采用一体化系统设备，既利于后期维护和作业管理，又持续降低了污水排放有害物质的含量。 **Beixin Company of Research & Design Institute Group** invested RMB 550,000 to update the facilities at the sewage treatment station and the updated sewage treatment equipment adopts the integrated system which not only facilitates later maintenance and operation management, but also reduces the content of poisonous substances in discharged sewage.	**通号（郑州）电气化局**在工程项目实施生活垃圾和施工垃圾分开存放。生活垃圾采用带盖垃圾桶，定时清运；施工垃圾存放在封闭式垃圾站内，垃圾站边设有分拣池。垃圾站采用轻钢结构制成，设有推拉式大门，可以移动和周转使用。 **CRSC (Zhengzhou) Electrification Bureau** separated household wastes with construction wastes in engineering projects. Household wastes are stored in the dustbin with lid and transferred on a regular basis; while construction wastes are stored in closed waste station with sorting area set aside. The waste station is constructed by light steels and has a push-pull gate for movement and transfer.	**通号工程局集团**在施工现场采取隔音措施或调整作业时间，控制噪声强度。 **CRSC Engineering Group** took sound insulation measures or adjusted the operation time at the construction site to control the noise intensity.

中国通号 2020-2022 年度一般废弃物排放情况
CRSC's General Waste Discharge in 2020-2022

一般废弃物类型 General waste types	生产制造 Wastes from manufacture					工程建设 Engineering construction	办公场所 Wastes from office				
	木材 Timber	塑料 Plastic	金属 Metal	纸箱 Carton	其他 Others	建筑垃圾处理量 Construction waste disposal volume	废纸 Wastepaper	废旧灯管 Waste lamp	电子垃圾 Electronic waste	硒鼓等打印耗材 Toner cartridges and other printing consumables	灯泡 Bulb
	吨 Ton	吨 Ton	吨 Ton	吨 Ton	吨 Ton	吨 Ton	千克 Kg	根 Pcs	台 Set	个 Pcs	个 Pcs
2020	107.2	330.7	1,355.9	99.0	133.5	6,040.6	49,292.5	6,660	617	5,113	889
2021	104.5	320.3	692.9	100.7	133.2	28,753.3	35,405.6	9,527	1,109	4,834	1,366
2022	139.9	221.2	934.8	63.3	159.1	17,542.0	33,498.1	10,074	1,078	7,279	1,474

中国通号 2020-2022 年度污染物排放情况
CRSC's Pollutant Emissions in 2020-2022



提供绿色解决方案
Providing Green Solutions

中国通号紧密围绕当今世界铁路科技发展新形势，在产品设计、研发、生产、应用全过程深入践行绿色低碳理念，全面提升轨道交通智能调度指挥、驾驶、制造、建造、运维等智能化水平，在能源分级利用、工业园区改造升级、信息化监控智能管理、在线仿真控制技术、绿色建筑智能楼宇等方面不断进行技术优化，推出海绵城市、地下综合管理综合监控与报警系统、智慧建筑综合应用系统等一系列成果，为发展成为全球最大轨道交通控制系统解决方案提供商注入绿色动力、贡献不竭力量。

Adhering closely to the new trends for the current technological development of global railway, CRSC deeply practices the green and low-carbon concept throughout the entire process of product design, R&D, production and application, fully improves the intelligent application in rail transportation including intelligent scheduling and command, driving, manufacturing, construction and operation & maintenance, and continuously optimizes technologies in energy graded utilization, transformation and upgrading of industrial parks, intelligent management of information-based monitoring, online simulation control technology, and intelligent buildings for green buildings, and launches a series of achievements such as sponge city, underground comprehensive management comprehensive monitoring and alarm system, and intelligent building comprehensive application system, to inject green impetus and contribute inexhaustible strengths to developing into the world's largest solution provider of rail transportation control system.

案例 *Case* **卡斯柯自主研发新系统，推动货运铁路更加节能降碳** ▶▶▶

New System Independently Researched and Developed by Casco Promotes Freight Railway to Save More Energy and Reduce More Carbon

2022 年 3 月，由卡斯柯自主研发的基于北斗定位的移动闭塞智能列控系统在靖神铁路完成了满载的万吨重载列车追踪试验。这是继多车空载追踪试验后，卡斯柯在列控研发领域的一次重要的技术升级和关键突破。

In March 2022, the mobile block intelligent train control system independently researched and developed by Casco based on Beidou positioning completed the ten-thousand full-load train tracking test on Jingbian-Shenmu Railway. This marks an important technical upgrade and a key breakthrough of Casco in R&D of train control system, after the multi-vehicle no-load tracking test.

基于北斗卫星定位的移动闭塞智能列控系统是货运铁路的技术发展方向，可有效推动铁路运输技术和装备进步，既能满足运营维护单位对高运能、高实时、高密度、无人化及强安全的重载货运需求，又有利于实现“碳达峰、碳中和”“公转铁”等国家战略部署针对重载铁路实现绿色低碳转型的要求。

The mobile block intelligent train control system based on Beidou positioning shows the direction for technical development of freight railway and can effectively promote the advances of railway transport technology and equipment.It can not only satisfy the needs of operation & maintenance units for scalable, real-time, highly densified, unmanned and strongly safe heavy-haul freight, but also help realize the requirements of national strategy on green and low-carbon transformation of heavy-haul railway including “carbon peaking, carbon neutrality” and “transferring loads from roadway to railway”.

落实环境管理
Environmental Management

中国通号强化全生命周期环境管理，制定节能环保管理制度，完善环境应急机制，落实环境风险常态化管控和环境质量提升工程，加大环保节能检查，在全系统开展“六五”环境日、全国节能宣传周和全国低碳日宣传活动，为公司实施绿色发展奠定坚实基础。2022 年，公司未发生突发环境事件，环境形势持续稳定。

CRSC strengthens full life circle environmental management, formulates the energy-saving environmental protection management system, improves environmental emergency mechanism, implements regular control of environmental risks and improvement of environmental quality, increased environmental energy-saving checks, conducts propaganda activities covering the entire system including the “June 5th” Environment Day, National Energy-saving Publicity Week and National Low Carbon Day to lay solid base for the Company to pursue green development. In 2022, the Company had no environmental emergency accidents and the overall environmental situation is maintained stable.



西安工业集团西信公司零件加工中心数控班组现场组织开展环境与安全应急演练活动

The Numerical Shift, Parts Processing Center of Xixin Company, Xi'an Industry Group organizes the emergency drill on environment and safety



通号（郑州）电气化局郑铁公司组织节能宣传周活动，宣贯节能节材等相关知识

Zhengtie Company of CRSC (Zhengzhou) Electrification Bureau organizes the activity of Energy-saving Publicity Week to popularize relevant knowledge on saving energy and materials

人才关爱，成就员工
Cherish Talents and Achieve staff's value

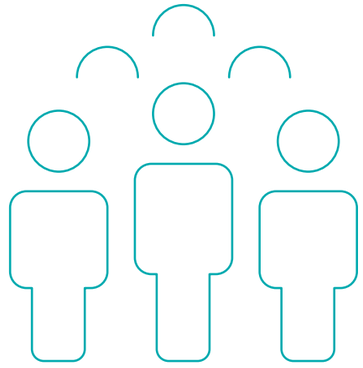
员工是企业最宝贵的财富。中国通号始终坚持以人为本，实施“开放引进、精英集聚”的人才战略，依法保障员工基本权益，助力员工成长发展，全力打造劳模品牌，落实落细多样关怀，持续提高每一位员工的获得感和幸福感。

Employee is the most valuable asset of a company. Adhering to the people-oriented philosophy, CRSC implements the talent strategy of “opening up to introduce and gather elites”, ensures the basic rights and interests of employees, helps employees grow and develop, builds up the brand of model workers, cares about employees from different aspects and constantly increases the sense of obtainment and happiness of each employee.

优化员工结构
Optimizing Staff Mix

中国通号制定《招聘管理制度》，强化招聘流程规范性，严格遵守相关招聘纪律，确保招聘工作公平、公正；全面开展“国聘行动”、海外高层次人才招聘、夏季公开招聘等人才引进，逐步实现选人用人制度化、标准化、常态化，提升公司人才的整体水平。截至报告期末，中国通号共有员工总数 20,009 人，劳动合同签订率 100%，社会保险覆盖率 100%。

CRSC formulates the Recruitment Management System to further standardize its procedures of recruitment, strictly abides by relevant disciplines of recruitment, and ensures fairness and justice in this regard; comprehensively introduces talents by undertaking the “IGUOPIN Action”, recruitment of overseas high-level talents and summer open recruitment fair, gradually realizes the recruitment in a systematic, standardized and regular manner, and improves the overall level of the Company’s talents. As of the end of the report period, the Company had a total of 20,009 employees, a labor contract signing rate of 100 percent and a social insurance coverage rate of 100 percent.



员工总数 **20,009** 人

a total of 20,009 employees

劳动合同签订率 **100** %

a labor contract signing rate of 100 percent

社会保险覆盖率 **100** %

a social insurance coverage rate of 100 percent

中国通号 2022 年度员工构成情况
CRSC' Staff Composition in 2022

	类别 Category	单位 Unit	人数 Number of employees
按员工类型划分雇佣人员总数 By employee type	劳动合同员工 Under employment contract	人 Person	20,009
	劳务协议员工 Under labor agreement	人 Person	41
	第三方派遣员工（含劳务派遣和股东方派驻） Dispatched by third parties (including labor dispatching and shareholder dispatching)	人 Person	940
按年龄结构划分的员工数量 By age	≥ 51 岁 ≥51 years old	人 Person	2,546
	31-50 岁 31-50 years old	人 Person	12,033
	≤ 30 岁 ≤30 years old	人 Person	5,430
按层级划分的员工数量 By employee level	高级管理人员 Senior management	人 Person	218
	中层管理人员 Middle-level management	人 Person	1,001
	普通员工 Ordinary employees	人 Person	18,790
按性别划分的员工数量 By gender	男 Male	人 Person	15,068
	女 Female	人 Person	4,941
按地区划分的员工数量 By region	中国内陆 China Mainland	人 Person	19,912
	港澳台 Hong Kong, Macao and Taiwan	人 Person	1
	国外 Overseas	人 Person	96

维护员工权益
Safeguarding the Rights and Interests of Employees

中国通号严格遵守《劳动法》《劳动合同法》《工会法》《企业民主管理规定》等相关法律法规，依法维护国际公认的各项人权，构建合理高效的薪酬福利体系，推进民主管理，建立和谐稳定的劳动关系。

CRSC strictly abides by relevant laws and regulations including the *Labor Law*, the *Labor Contract Law*, the *Trade Union Law* and the *Regulations on Democratic Management of Enterprises*, safeguards human rights recognized by international community according to law, constructs a reasonable and efficient system on remuneration and benefits, promotes democratic management, and establishes harmonious and stable labor relations.

平等雇佣
Equal Employment

中国通号坚持平等雇佣，自觉抵制任何漠视与践踏人权的行为，杜绝一切因国籍、民族、性别、年龄、宗教信仰和文化背景等产生的歧视，落实同工同酬，杜绝雇用童工或强迫劳动；制定《劳动合同管理暂行办法》，依法与员工订立、履行、变更、解除或终止劳动合同，确保劳动合同得到严格履行。

CRSC sticks to equal employment, positively resists any behavior disregarding or trampling human rights, completely eradicates any discrimination caused by the difference in nationality, ethnic group, gender, age, religious belief and cultural background, implements same remuneration for the same position, refuses the employment of child labor or force labor, formulates the *Tentative Measures on Labor Contract Management*, and signs, performs, changes, cancels or terminates the labor contract with employees according to law to ensure strict performance of such contract.



薪酬福利
Remuneration and Benefits

中国通号基本建成工资总额分级分类管理模式，切实建立健全职工工资与经济效益同向联动、能增能减的机制；印发《关于加强全员绩效考核工作的指导意见》健全考核体系，加强绩效考核在薪酬中的运用。为员工按时足额缴纳社会保险费和补充养老保险费、补充医疗保险费及住房公积金，发放或支付各项补贴和福利，制定印发《关于进一步规范实施企业年金的指导意见》，充分体现企业年金制度的公平性。

CRSC basically establishes the tiered and classified management of remunerations, strictly sets up and improves the mechanism to link, increase or decrease employee salary with the economic benefits, and issues the *Guiding Opinions on Strengthening Performance Assessment of Employees* to improve the assessment system and enhance the application of performance assessment in remunerations. The Company pays the social insurance fees, supplementary pension insurance premiums, supplementary medical insurance premiums and housing provident funds for employees in full amount, grants or pays subsidies and allowances of different kind and formulates and issues the *Guiding Opinions on Further Standardizing Enterprise Annuity* to ensure fairness of the Company's annuity system.

民主管理
Democratic Management

中国通号充分实施民主管理，加强民主沟通。建立健全以职工代表大会为基本形式的企业民主管理制度，实行厂务公开，推行民主管理。依法建立职工董事和职工监事制度。依法维护公司和职工的合法权益，建立健全稳定的劳动关系，推动完善集体协商制度，平等协商签订《集体合同》《工资专项协议》，保障员工享有的知情权、参与权、表达权、监督权等民主权利。

CRSC fully implements democratic management to strengthen democratic communications. We establish and improve the democratic management system of enterprises with the basic form of workers' congress, implement the openness of factory affairs and promote democratic management. Establish the system of employee directors and employee supervisors according to law. Safeguard the legitimate rights and interests of the company and employees according to law, establish and improve stable labor relations, promote the improvement of the collective consultation system, negotiate and sign the *Collective Contract* and *Wage Special Agreement*, protect the democratic rights of employees such as the right to know, participation, expression and supervision.

保障职业健康
Safeguarding Occupational Health

中国通号遵守《职业病防治法》，规范劳动保护职责、劳动保护措施、劳动防护用品管理、事故隐患和事故处理，推动54 家所属企业全部通过职业健康安全管理体系认证；定期进行体检，梳理涉及职业病危害因素的作业点分布情况，对作业场所进行检测，减少生产过程中产生的职业病危害因素；提供专业心理服务，缓解身心健康压力；加大职业健康宣传，提高职业病防护意识。2020–2022 年，公司因工亡故人数、发生职业病及职业中毒等事故数均为 0。

CRSC abides by the *Law on Prevention and Control of Occupational Diseases* normalizes the duties and measures on labor protection, the management of labor protective supplies and the treatment of potential hazards and accidents, promotes 54 affiliated enterprises to pass the certification of Occupation Health Safety Management System, conducts regular physical examinations, sorts out the operation sites involving hazardous factors of occupational disease and tests such sites to alleviate the hazardous factors generated during production, provides professional mental consultation services to relieve employees of the physical and mental stress, and improves publicity on occupational health to raise the awareness on prevention and control of occupational diseases. From 2020 to 2022, the number of deaths in work-related injury, occupational diseases and occupational poisoning in the Company was 0.

塑造劳模品牌
Building a Model Worker Brand

中国通号大力弘扬劳模精神、劳动精神、工匠精神，开展劳模先进评选，充分弘扬劳动光荣、技能宝贵、创造伟大的时代风尚。

CRSC greatly promotes the spirit of model workers, of labor and of craftsmanship, carries out the selection of advanced model workers, and fully promotes the glorious labor, valuable skills, and creates a great fashion of the times.

同时，中国通号持续深化劳模先进创新创效活动，加强劳模先进创新工作室建设。截至目前，全系统已创建劳模创新工作室 28 个，获得专利 110 项，开展创新攻关项目 103 次，推动创新成果转化 76 项，创造经济效益近 2 亿元，有力推动工会工作与生产经营深度融合。西安工业集团沈信公司邓宇工作室成为全国铁路机务系统劳模和工匠人才创新工作室联盟首批理事会成员单位。

In the meantime, CRSC continues to deepen advanced innovation and efficiency activities of model workers and strengthen the building of the model worker innovation studio. As of now, the Company has established in total 28 innovation studios, won 110 patents, undertaken 103 innovative and key projects, transformed 76 innovative results, and created the economic benefits of nearly RMB 200 million, which effectively promoted the deep integration between the works of labor union and its production and operation. Deng Yu Studio of Shenxin Company of Xi'an Industry Group became one of the first batch of council member units of National Railway Maintenance System Model Worker and Talent Innovation Studio Alliance.



2022 年 10 月，西安工业集团沈信公司柯晓宾先进模范事迹被《新闻联播》“二十大代表风采” 报道

In October 2022, the advanced model story of Ke Xiaobin, from, Shenxin Company of Xi'an Industry Group,was reported by the “Stories of Representatives of the 20th CPC National Congress” of *CCTV News Broadcast*

研究设计院集团
Research & Design Institute Group

- 荣获 “火车头奖杯”
  won the title of "Locomotive Trophy"
- 刘贞荣获 “火车头奖章” 荣誉、当选 “2022 年度最美铁路人”
  Liu Zhen won the title of “Locomotive Medal” and “The Most Beautiful Railway Man” in 2022
- 江明当选 2022 年 “新时代 铁路榜样” 推荐人选
  Jiang Ming was elected as a candidate of the “New Era Railway Model” in 2022

通信信息集团
CRSCIC

- 刘阳荣获 “火车头奖章” 荣誉
  Liu Yang won the title of “Locomotive Medal”

城交公司
Urban Rail Transit Company

- 邱锡宏荣获 “火车头奖章” 荣誉
  Qiu Xihong won the title of “Locomotive Medal”

西安工业集团
Xi'an Industry Group

- 荣获 “全国五四红旗团委” 称号
  won the title of “National May Fourth Red Flag League Committee”
- 陈坤耀荣获“西安市五一劳动奖章” 荣誉
  Chen Kunyao won “the Labor Day Medal of Xi’an”

通号工程局集团
Engineering Group

- 荣获 “火车头奖杯”
  won the title of "Locomotive Trophy"
- 丁向涛荣获 “全国交通技术能手” 称号
  Ding Xiangtao won the title of “National Transportation Technical Expert”

上海工程局集团
Shanghai Engineering Group

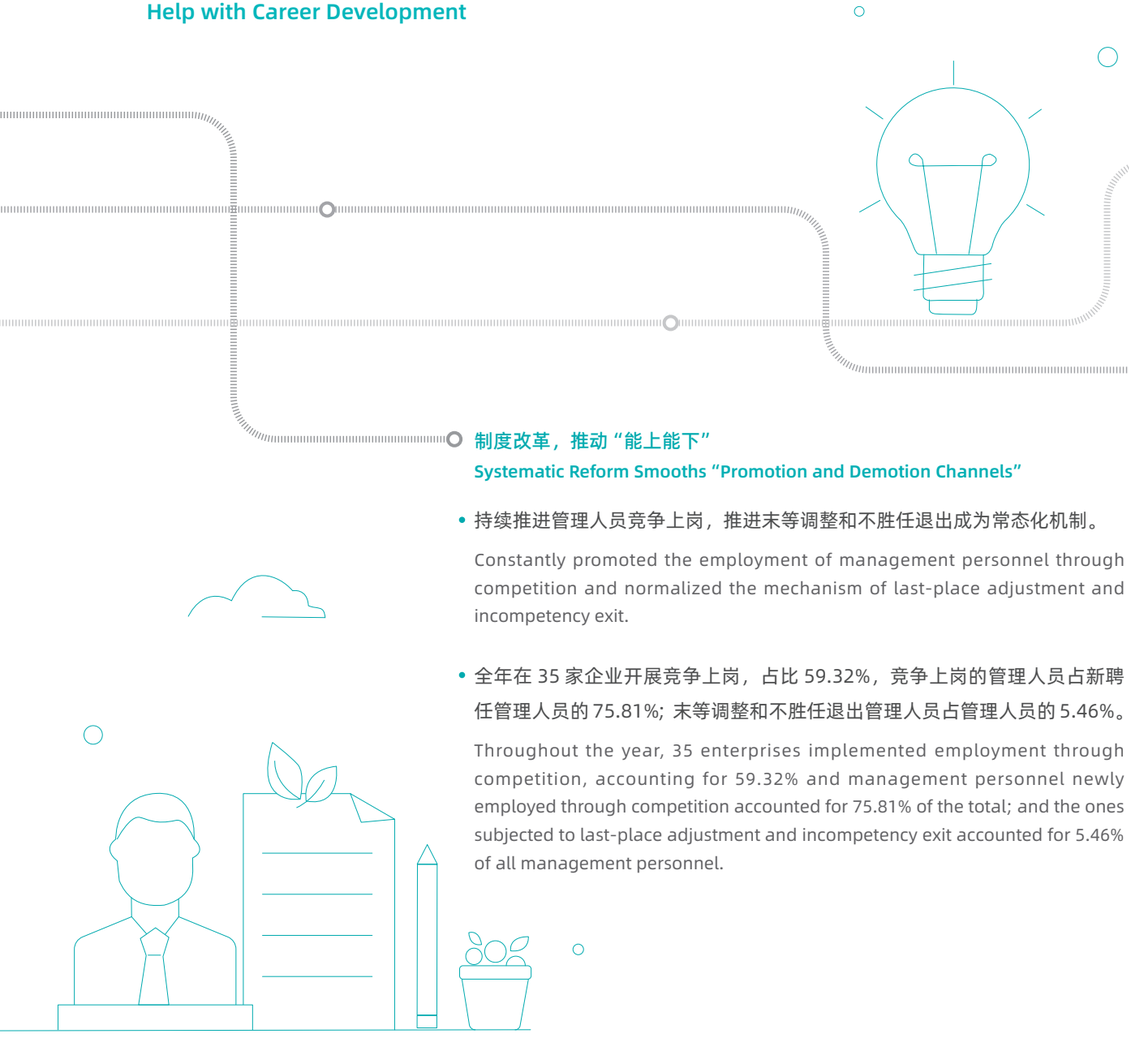
- 荣获 2020–2021 年度全国“安康杯” 竞赛优胜班组
  won the title of Excellent Group at the National Safety Cup Competition 2020-2021
- 荣获 “云南省工人先锋号” 称号
  won the title of “Yunnan Workers' Pioneer”

赋能员工成长
Empowering Employees to Grow

中国通号努力为员工搭建职业发展平台，完善培训体系，开展劳动竞赛，着力培养高素质专业化人才队伍，助力员工成长成才，成就员工职业发展梦想。

CRSC endeavors to build the career development platform for employees, improves the training system, holds labor competitions, focuses on cultivating high-quality professional talents, helps employees grow and achieve their dreams in career development.

助力职业发展
Help with Career Development



制度改革，推动“能上能下”
Systematic Reform Smooths “Promotion and Demotion Channels”

- 持续推进管理人员竞争上岗，推进末等调整和不胜任退出成为常态化机制。

  Constantly promoted the employment of management personnel through competition and normalized the mechanism of last-place adjustment and incompetency exit.

- 全年在 35 家企业开展竞争上岗，占比 59.32%，竞争上岗的管理人员占新聘任管理人员的 75.81%；末等调整和不胜任退出管理人员占管理人员的 5.46%。

  Throughout the year, 35 enterprises implemented employment through competition, accounting for 59.32% and management personnel newly employed through competition accounted for 75.81% of the total; and the ones subjected to last-place adjustment and incompetency exit accounted for 5.46% of all management personnel.





中国通号两名高技能人才代表，研究设计院集团北信公司冯浩（左）、西安工业集团沈信公司邓宇（右），入选中央企业“大国工匠”培养支持计划

Two highly skilled talent representatives of CRSC, Feng Hao (left), from Beixin Company of Research & Design Institute Group and Deng Yu (right), from Shenxin Company of Xi'an Industry Group were selected into the cultivation and support program of “National Craftsmen” of central enterprises

选优任能，赋能优秀年轻干部
Employment Optimization Empowers Young and Excellent Cadres

- 全面开展优秀年轻干部摸底调研，编制“优秀年轻干部试点工程”实施方案，完善优秀年轻干部人才库。

  Fully undertook thorough investigation of excellent young cadres, formulated the implementation plan for “pilot project of excellent young cadres” and improved the talent pool of excellent young cadres.

- 注重提拔使用优秀年轻管理人才，全年新选拔任用领导人员中，45岁以下年轻干部占比超过半数。

  Emphasized the promotion and employment of excellent young management talents with young cadres aged below 45 accounting for more than 50% of all newly selected and appointed leading personnels within the year.

- 采用揭榜挂帅形式，为优秀年轻干部和青年科技英才提供机会和平台。

  Through “open competitions”, provided opportunities and platforms for excellent young cadres and young technological elites.

激发活力，锤炼技能人才队伍
Stimulating Vitality Cultivates Talent Groups with Skills

- 提升技能人才队伍建设，着力培养大国工匠、高技能人才，制定发布《关于职业技能等级认定工作指导意见》。

  Improved team building of talents with skills, focused on cultivating national craftsmen and highly skilled talents, formulated and issued the Guiding Opinions on Accreditation of Occupational Skill Levels.

- 建立新时代技能人才职业技能等级制度。

  Established the occupational skill level system for skilled talents in the new era.

提升培训质效
Improve Quality and Effectiveness of Training

中国通号完善《培训管理办法》，构建“内部培训为主、外部培训为辅，制定培训计划为主、临时培训为辅，团队培训为主、个体培训为辅，管理与业务培训兼顾、按照岗位设置”的差异性培训模式，提高教育培训的针对性和实效性；制定年度培养计划，开设系统化、多元化培训课程，分类培养经营管理人才、专业技术人才、高技能人才及特殊领域紧缺人才；优化“线上 + 线下”“师带徒”“校企联合培养”等方式，多措并举确保培训项目落实落地，为全体员工赋能。

CRSC improves the Training Management Measures, builds the differentiated training mode of “internal training supplemented by external training, scheduled training supplemented by interim training, group training supplemented by individual training, emphasizing both management training and business training and training set as per different positions” to improve focus and effectiveness of education and training, formulates annual cultivation plan, opens systematic and diversified training courses, cultivates talents by categories including operation management talents, professional technical talents, highly skilled talents and urgently-needed talents in special areas, optimizes “online + offline”, “mentoring”, “joint cultivation by university and enterprise” and other cultivation methods, and takes multiple measures to ensure the implementation of training programs and empower all employees.

类别 Type		员工培训百分比（%） Percentage of staff trained (%)			人均培训时长（小时） Average training time (hours)		
		2020	2021	2022	2020	2021	2022
按性别划分的员工培训情况 By gender	男 Male	85.3	86.37	85.29	29.6	35.06	27.42
	女 Female	81.7	80.65	82.19	26.9	28.57	23.29
按雇员层级划分的员工培训情况 By employee level	高级管理层 Senior management	100	100	88.53	73.8	108.14	63.67
	中级管理层 Middle-level management	100	90.16	93.61	35.4	57.95	52.73
	基层员工 Entry level employee	81.7	84.93	83.99	27.3	31.23	29.57



中国通号推行“师带徒”机制，提升年轻员工业务操作能力

CRSC implements the “mentoring” mechanism to improve the practical abilities of young employees

开展劳动竞赛
Hold Labor Competitions

中国通号持续开展和参与以“比、学、赶、帮、超”为内容的劳动竞赛，切实将岗位练兵、劳动竞赛和技能比武作为提升员工技能素质，实现公司与职工同频共振的重要途径，有效激发调动广大干部职工干事和创业激情。

CRSC constantly holds and participates in the labor competitions themed “comparison, learning, chasing, helping and exceeding” to actually take post practices, labor competitions and skill competitions as important ways to improve the skills of employees and align employees with corporate actions, which has effectively motivated the passions and enthusiasm of the cadres and employees.



西安工业集团沈信公司王显超（左）在 2022 年 IPC 手工焊接全球大赛中，荣获全球季军

Wang Xianchao (left), from Shenxin Company of Xi'an Industry Group won the global third place in the IPC Hand Soldering Competition 2022

落实员工关怀
Implementing Employee Care

中国通号致力于打造团结、友爱、进取的公司氛围，关心关怀一线员工、女性员工，积极落实困难员工帮扶，开展丰富多彩的文体活动，平衡员工工作和生活，用心用情满足员工对美好生活的需求和期待。

CRSC dedicates itself to creating the corporate atmosphere of unity, friendliness and enterprise, cares about workers at the production lines and female employees, actively helps employees in need, holds diversified cultural and sports activities, emphasizes balance between work and life for employees and satisfies the needs and expectations of employees for a better life.

帮扶困难员工 Helping Employees in Need

发布《工会帮扶救助实施办法》，推进工会系统建立三级帮扶救助体系，扎实推动员工救助帮扶工作。2022 年，各级工会组织在春节期间筹集送温暖资金 513.23 万元，慰问困难职工家庭 498 个，发放慰问物资 65.05 万元，慰问一线职工、劳模先进 9,604 人，一线班组 293 个，发放慰问物资共计 448.17 万元。

Issued the *Trade Union Assistance Measures* to promote the trade union to establish the three-tier assistance system and carry out relevant assistance for employees. In 2022, trade unions of different levels raised RMB5,132,300 in warm funds during the Spring Festival, subsidized 498 families of workers in need, distributed supplies worth RMB650,500, extended regards to 9,604 workers at the production line and model workers as well as 293 teams at the production line, and distributed supplies with a total worth of RMB4,481,700.

关爱一线员工 Caring for Front-Line Workers

改善一线员工生产生活条件，开展“职工之家”“送清凉、送关怀”“送温暖”等活动。

Improved the production and living conditions for workers at the production line and undertook activities such as “home of employees”, “cool summer” and “warm winter”.

关怀女性员工 Caring for Female Employees

持续落实《女职工劳动保护实施办法》，充分保障女性员工工作及生活需求，维护孕期、哺乳期女性员工的权益。

Kept implementing the *Measures for the Implementation of Labor Protection for Female Employees* to fully ensure the demands of female employees in work and life, and safeguard their rights and interests during pregnancy and lactation.

平衡工作生活 Balancing Work and Life

开展“三八节主题活动”“传承英烈精神，奋进伟大征程”“文化节系列活动”等文体活动，通过多彩的文艺汇演、公司团建、体育赛事，丰富员工业余文化生活，增强凝聚力和向心力。

Held the “Women's Day Theme Activity”, “Passing on the Spirit of Heroes to Forge Ahead Along the Great Path”, “Cultural Festival Series Activities” and other cultural and sports events and by diversified entertainment show, corporate team building and sports event, enriched the leisure life of employees and increased unity and cohesion.



卡斯柯庆祝“三八妇女节”，组织插花活动

Casco organizes the flower arrangement activity to celebrate the Women’s Day



通号建设集团组织篮球友谊赛

Construction Group organizes the basketball friendship match

交流合作，携手共赢
Achieve a Win-Win Situation through Exchange and cooperation

中国通号践行合作共赢理念，深化与“一带一路”沿线国家、企业的务实合作，推动中国高铁“走出去”，构筑人类命运共同体；深化多领域战略合作，整合多方优势资源，打造合作共赢“朋友圈”；持续推进责任采购，打造透明供应链，与供应商携手发展。

By carrying out the concept of win-win cooperation, CRSC deepens its practical cooperation with countries and enterprises along "the Belt and Road Initiative”route, and promotes “going global” of China's high-speed rail and the progress of the Community of Shared Future for Mankind. CRSC is striving to creates a "circle of friends" for win-win cooperation through deepening multi-field strategic cooperation and integrating various advantageous resources. It also keeps promoting responsible procurement and create a transparent supply chain for common development with suppliers.

深耕“一带一路”
In-depth Insight into "the Belt and Road Initiative"

中国通号主动与“一带一路”沿线国家政府战略对接，抓住 RCEP 等区域性合作框架重要机遇，深度融入所在地区规划、建设与发展，稳步开拓海外市场；充分发挥中国通号研发设计、产品制造、施工安装三位一体优势，依托匈塞铁路、雅万高铁等中国标准成套输出的成功范例，在重点区域继续开拓标志性工程，向海外提供中国方案，为推动中国高铁“走出去”贡献力量。

CRSC actively connects with the national governments along "the Belt and Road Initiative" route and seizes the important opportunities of regional cooperation frameworks such as RCEP, to deeply integrate into the regional planning, construction and development, and steadily explore overseas markets. By giving full play to the advantages of CRSC in R&D, design, product manufacturing, construction and installation, and referring to the successful cases of standard complete sets from China, such as the Hungary-Serbia railway and the Jakarta-Bandung high-speed railway, CRSC continues to develop landmark projects in key regions and offers China's solutions overseas, thus contributing to the "going global" of China's high-speed railway.

中国通号 2020-2022 年境外发展绩效
CRSC's Overseas Development Performance in 2020-2022

指标 Indicator	单位 Unit	2020	2021	2022
境外公开开展项目 Overseas public projects	个 Projects	17	16	12
设立境外单位 Establishment of overseas branches	户 Companies	37	31	34
境外业务涉及国家（地区） Countries (regions) of the overseas businesses	个 Countries (regions)	13	19	16

2022 年，中国通号境外业务重大进展

CRSC Has Made Significant Progress in Its Overseas Businesses in 2022

与泰国东北皇家理工大学(RMUTI)、柳州铁道职业技术学院在线签署三方合作谅解备忘录，推动中泰轨道技术发展，服务两国轨道交通专业人才培养。

CRSC signed the memorandum of understanding on three-party cooperation online with the Rajamangala University of Technology Thanyaburi (RMUTI) and Liuzhou Railway Vocational Technical College, to promote the development of rail technology between China and Thailand and serve the training of rail transportation professionals in both countries.

承担雅万高铁全线通信、信号、防灾、信息等相关工程施工任务，大大缩短从首都雅加达至万隆的时间，极大方便两地居民的日常出行。

CRSC undertook the constructions of communication, signal, disaster prevention, information and other related projects in Jakarta-Bandung high-speed railway, greatly shortening the time from Jakarta to Bandung, and profoundly facilitating the daily trips for residents in both places.

为匈塞铁路（塞尔维亚段）提供自主化 ETCS-2 列控系统支撑，线路最高运行时速达 200 公里，使首都贝尔格莱德至诺维萨德半小时可达，有效促进沿线旅游资源开发、城市化建设，助力打造中欧贸易国际大通道。

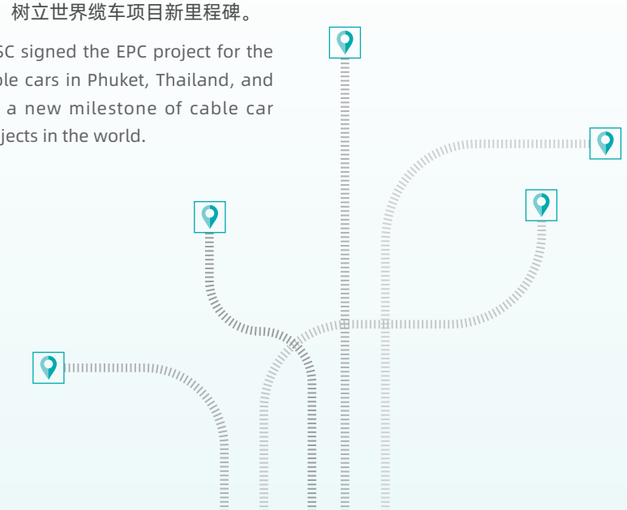
CRSC provided autonomous ETCS-2 train control system support for Hungary-Serbia railway (Serbia section), with a maximum running speed of 200 kilometers per hour, making it half an hour from the capital Belgrade to Novi Sad. This will effectively promote the development of tourism resources and urbanization along the line and help build an international corridor for Sino-European trade.

推动高质量建成埃及斋月十日城市郊铁路，线路连接开罗与新首都，为打造“东部经济走廊”提供重要交通配套工程；线路开通后，将惠及沿线 500 万居民。

CRSC promoted the high-quality construction of the suburban railway for the Tenth of Ramadan City in Egypt, connecting Cairo with the new Capital, and offering important transportation supporting projects for building the "Eastern Economic Corridor". After the operation of the railway, it will benefit 5 million residents along the route.

签订泰国普吉岛缆车 EPC 总承包项目，树立世界缆车项目新里程碑。

CRSC signed the EPC project for the cable cars in Phuket, Thailand, and set a new milestone of cable car projects in the world.



案例 *Case* 中国通号助推雅万高铁试验运行圆满成功

CRSC Helps the Successful Trial Run of Jakarta-Bandung High-speed Railway

2022 年 11 月，国家主席习近平在巴厘岛同印度尼西亚总统佐科共同视频观摩雅万高铁试验运行，中国通号全力保障的雅万高铁试验运行取得圆满成功，全体参建人员用实际行动向二十国集团（G20）峰会展示了中国高铁这张“靓丽名片”。

In November 2022, President Xi Jinping and Indonesian President Djoko watched the trial run of Jakarta-Bandung high-speed railway by video. Such trial run, fully backed by CRSC, was a complete success. All the participants showed the strength of China's high-speed railway as a "representative landmark" to the G20 Summit with practical actions.



作为雅万高铁中方主要参建企业之一，中国通号负责全线的全部技术、施工、维护任务，通过精心筹划项目施工组织，抢抓工程进度，克服种种困难，提前 10 天完成了德卡鲁尔站至 4 号梁场间建设任务，努力将雅万高铁打造成精品工程、示范工程，为落实“一带一路”倡议、促进中印尼友好合作做出积极贡献。

As one of the major Chinese participant in the construction of Jakarta-Bandung high-speed railway, CRSC is responsible for all the technical, construction and maintenance tasks of the whole railway. Through carefully planning the project construction organization and highlighting the construction progress and overcoming various difficulties, CRSC completed the construction tasks from Tegal Luar Station to No.4 girder fabrication yard 10 days in advance. CRSC had made great efforts to build the Jakarta-Bandung high-speed railway into a high-quality project and a demonstration project, making positive contributions to the implementation of "the Belt and Road Initiative" and promoting friendly cooperation between China and Indonesia.

> 雅万高铁项目的成功实施，创造了中印尼务实合作的新纪录，将为两国各领域合作特别是基础设施和产能领域的合作树立新的标杆。
>
> *The successful implementation of the Jakarta-Bandung High-speed Railway Project has set a new record for pragmatic cooperation between China and Indonesia, and will set a new benchmark for cooperation between the two countries in various fields, especially in infrastructure and production capacity.*
>
> ——习近平主席在雅万高铁项目动工时，向印尼总统佐科致贺信时指出
>
> *–President Xi Jinping pointed out when he sent a congratulatory letter to Indonesian President Djoko upon the commencement of the Jakarta-Bandung High-speed Railway Project*

深化战略合作
Deepening Strategic Cooperation

中国通号立足自身产业优势，加强对接人才、资本、技术、信息等外部优势资源，积极与企业、高校、科研机构、政府等展开合作和业务交流，推动外部协同创新，实现与各方伙伴在紧密合作中优势互补、共同成长，携手创造更多价值。

Based on its own industrial advantages, CRSC strengthens the connections with external superior resources such as talents, capital, technology and information, and actively conducts cooperation and business exchanges with enterprises, universities, scientific research institutions and the government agencies, to promote external collaborative innovation, achieve mutual complementarity and common growth in close cooperation with all partners, and finally create more value together.

企企合作 Enterprise-Enterprise Cooperation

- 与国家能源集团、中国铁塔等企业开展务实合作，为中国铁路事业提供建设方案

  CRSC has established pragmatic cooperation with enterprises such as CHN Energy and China Tower to provide construction schemes for China's railway industry.

- 与航天科工第三研究院签署战略合作协议，建立高速飞行列车信号通信领域战略合作伙伴关系

  CRSC has signed a strategic cooperation agreement with the CASIC Third Institute to establish a strategic partnership in the field of high-speed flight train signal communication.

- 与中城协、申通地铁、中机认检等 12 家产业链上下游单位签订联合体协议

  CRSC has signed consortium agreements with 12 upstream and downstream organizations in the industrial chain, such as CAMET, Shanghai Shentong Metro Co., Ltd., and CMCI.

- 与国铁集团合作，推动郑州航空港站开通运营

  CRSC cooperates with China Railway Group Co.,Ltd. to promote the operation of Zhengzhou Airport Station.

企校合作 School-Enterprise Cooperation

- 与北京交通大学、西南交通大学等高校成功申报国家重点研发计划“轨道交通调度控制一体化与联程运输服务技术”项目

  CRSC has successfully applied for the "Rail Transit Dispatching and Control Integration and Interline Transportation Service Technology" Project under the national key research and development program jointly with Beijing Jiaotong University, Southwest Jiaotong University and other universities.

- 与北京交通运输职业学院等单位共建“轨道交通通信信号产业学院”，着力打造职业教育产业集群化联合体

  CRSC has jointly established "Rail Transit Communication and Signal Industry College" with Beijing Vocational College of Transportation and other organizations, making great efforts to build a cluster consortium of vocational education industries.

政企合作 Government-Enterprise Cooperation

- 与河南省洛阳市等政府部门开展合作，助力地方城市交通通行效率，为区域经济增长作贡献

  CRSC cooperates with government departments such as Luoyang City, Henan Province, to help higher local urban traffic efficiency and contribute to regional economic growth.

案例 *Case*

强强合作，研究设计院集团成功入选全国首批“科创中国”创新基地

The Research & Design Institute Group Was Successfully Listed as the First Batch of "Innovation China" Innovation Bases in China with Strong Cooperation

2022 年 8 月，研究设计院集团成功入选中国科协首批“科创中国”创新基地（产学研协作类）名单。近年来，研究设计院集团积极推进与各高校、科研院所和学会、协会的合作，与清华大学、北京大学等多所知名高校与科研院所建立联合研究所和人才联合培养基地，在列车自主运行控制、智能运输等方面开展深度联合研究，同时，凭借企业轨道交通安全控制全产业链技术优势，与产业上下游企业共同打造生态圈和产业链。近三年，公司与高校合作科研项目 49 项，与企业合作科研项目 100 余项。

In August 2022, the Research & Design Institute Group was successfully listed as the first batch of first batch of "Innovation China" Innovation Bases (Industry-University-Research Cooperation Category) of China Association for Science and Technology. In recent years, the Research & Design Institute Group has actively promoted cooperation with universities, research institutes, societies and associations,established joint research institutes and talent training bases with many well-known universities and research institutes such as Tsinghua University and Peking University, and carried out in-depth joint research on train autonomous operation control and intelligent transportation. Additionally, the Research and Design Institute Group and the upstream and downstream enterprises of the industry have jointly built an ecological circle and industrial chain by relying on the technical advantages of the whole industrial chain of enterprise rail transit safety control. In the past three years, the Company has cooperated with universities in 49 scientific research projects and enterprises in more than 100 scientific research projects.

近三年

公司与高校合作科研项目

49 项

与企业合作科研项目

100 余项

In the past three years, the Company has cooperated with universities in 49 scientific research projects and enterprises in more than 100 scientific research projects



中国通号与中国铁塔签署战略合作协议

CRSC signed a strategic cooperation agreement with China Tower

构建责任供应链
Constructing Responsible Supply Chain

中国通号树立科学化、精益化采购管理理念，落实供应商、承包商专项管理，不断完善采购管理体系，确保采购管理始终在阳光下规范运行；完善供应商管理体系，与供应商建立长期、稳定的合作关系，推动产业链、供应链可持续发展。

CRSC has established a scientific and lean procurement management concept. It implements special management of suppliers and contractors, and continuously improves the procurement management system to ensure that procurement management is always in a standardized operation in a transparent manner; CRSC perfects the supplier management system, and establishes a long-term and stable cooperative relationship with suppliers, to promote the sustainable development of the industrial chain and supply chain.

采购管理
Procurement Management

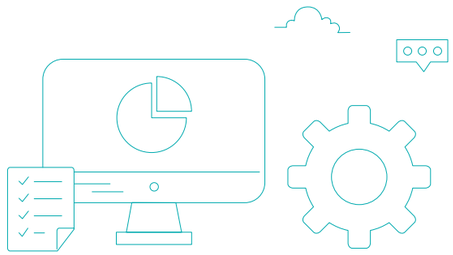
中国通号制定《采购管理办法》《招标管理办法》等制度规范，严格推行集中采购、分级实施；建立采购管理提升长效机制，实现采购管理制度化、流程化、信息化；积极创新采购形式，开展联合采购、战略采购、框架协议采购、绿色采购等，提高采购效率效益；严格禁止各级领导人员超越权限违规干预采购活动；要求供应商提交完整且有效的企业信息与资质信息，证明近两年未受到国家、行业、股份公司的质量责任事故通报，未列入供应商黑名单。

CRSC has formulated *the Procurement Management Measures*, Bidding Management Measures, and other system specifications, to strictly implements centralized procurement and hierarchical implementation. CRSC has established a long-term mechanism for improving procurement management to realize the institutionalized, streamlined and informationized procurement management. It actively innovates the procurement form, carries out joint procurement, strategic procurement, framework agreement procurement, green procurement, etc. to improve the efficiency and effectiveness of procurement. CRSC strictly prohibits leaders at all levels from interfering in procurement activities beyond their authority and in violation of regulations. It requires suppliers to submit complete and valid enterprise information and qualification information, and requires that suppliers shall neither have been notified of any quality accident by the central government, industry or joint-stock company, nor have been included in the supplier blacklist in the past two years.

供应商管理
Supplier Management

中国通号制定《供应商管理办法》《供应商信用评价管理办法》《供应商“黑名单”管理办法》，持续规范供应商行为；建立供应商信用评价档案，完善与供应商沟通机制，将供应商信用评价结果及时通知供应商，督促供应商守信履约；加强供应商资格审查，与供应商签订质量保证协议和廉洁协议，实施供应商动态考核机制，及时取消存在重大不良行为或进入黑名单的供应商的采购资格。

CRSC has formulated *the Measures for the Administration of Suppliers, Measures for the Administration of Supplier Credit Evaluation*, and *Measures for the Administration of "Black Lists" of Suppliers*, to continuously standardize supplier behavior. CRSC establishes a supplier credit evaluation file, improves the communication mechanism with suppliers, notifies suppliers of the supplier credit evaluation results in a timely manner, and urges suppliers to perform their obligations faithfully. CRSC strengthens the supplier qualification examination, signs quality assurance agreements and integrity agreements with suppliers, implements a dynamic supplier assessment mechanism, and promptly cancels the procurement qualification of suppliers with serious misconducts or blacklisted suppliers.



供应商准入
Supplier Access 01

在供应商商业信誉、财会制度、专业技术、生产供应能力等方面，严格把控供应商资格审查，鼓励有实力的供应商参与采购，严禁不符合程序和规定要求的企业进入合格供应商名录。

In terms of supplier business reputation, accounting system, professional technology, production and supply capacity, etc., CRSC strictly controls supplier qualification review, encourages powerful suppliers to participate in procurement, and strictly prohibits enterprises that do not meet the requirements of procedures and regulations from entering the list of qualified suppliers.

供应商质量评估
Supplier Quality Assessment 02

实施关键及重要供应商年度审查，监督检查供应商技术工艺、生产作业过程质量等内容，强化供应商产品质量安全风险考核。

Implement annual review of key and important suppliers, supervise and inspect suppliers' technical processes, production process quality, etc., and strengthen supplier product quality and safety risk assessment.

供应商信用评价
Supplier Credit Evaluation 03

开展供应商信用等级评价，对信用评价不合格的供应商，两年内不再受理其供应商准入申请、不得参与采购活动。供应商存在偷工减料、以次充好、供应假冒伪劣产品，或者给企业生产经营和项目建设带来严重负面影响等任一情形的，实行“一票否决”。

By carrying out supplier credit rating evaluation, CRSC will not accept the supplier access application for those who have failed to pass the credit evaluation, and provides that such suppliers shall not participate in procurement activities within two years. CRSC adopts the "one-vote veto" to suppliers who have any of the following situations: cheating on workmanship and materials, shoddy goods for quality goods, supply of counterfeit and shoddy products, or serious negative impacts on the production and operation of enterprises and project construction.

2022 年，信用评价共通报 41 家供应商不良行为，其中：潜在不良行为 9 家，一般不良行为 4 家，较大不良行为 7 家，重大不良行为 21 家，均给予处罚。

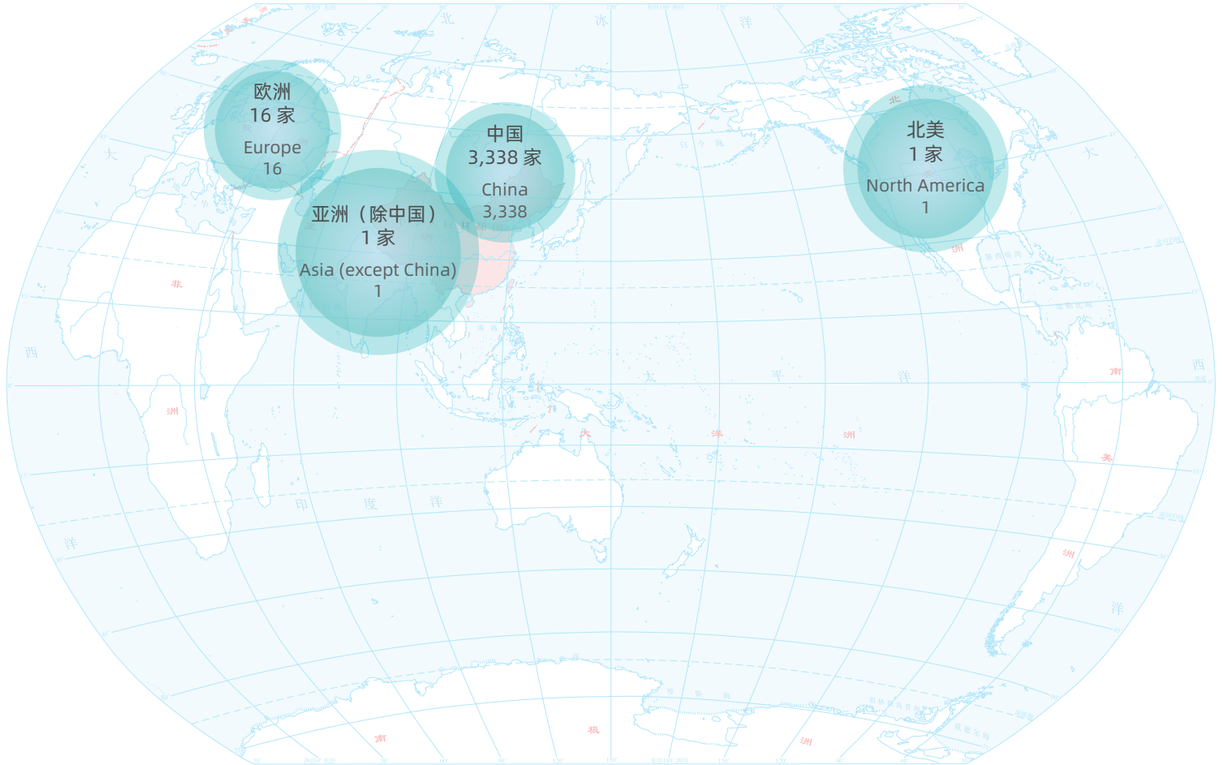
In 2022, the credit evaluation notified 41 suppliers with misconducts, among which 9 suppliers with potential misconducts, 4 suppliers with general bad behaviors, 7 were major misconducts and 21 suppliers with serious misconducts, all of which were punished.

供应商成长
Supplier Growth 04

注重加强与供应商协同发展，健全激励机制，适时召开供方质量沟通会，积极回应供应商的困惑和诉求，提供专业指导和支持，助力供应商优化产品和服务质量，提升经营管理能力。

Pay high attention to strengthening the coordinated development with suppliers, improving the incentive mechanism, holding quality communication meetings with suppliers in a timely manner, actively responding to the questions and demands of suppliers, providing professional guidance and support, helping suppliers to optimize the quality of products and services, and enhancing their management capabilities.

中国通号 2022 年供应商分布
CRSR's Supplier Distribution in 2022



乐于奉献，回馈社会
Contribute to the Society

中国通号致力于以实际行动回馈社会，坚定不移强化帮扶力度，巩固拓展脱贫攻坚成果；时刻绷紧防灾减灾责任弦，主动投身抢险救灾工作；持续深化青年志愿服务行动，开展丰富多彩的志愿活动，助力社会和谐稳定发展，充分彰显央企担当。

CRSC devotes itself to giving back to the society with practical actions, and unswervingly strengthens the efforts to consolidate and expand the achievements in poverty alleviation. CRSC has always been on the alert for disaster prevention and mitigation, and has taken the initiative to participate in the rescue and relief work. It continuously deepens the youth voluntary service action and carries out various voluntary activities to boost the harmonious and stable development of the society and to fully demonstrate the responsibility as the central enterprises.

服务乡村振兴
Serving Rural Revitalization

2022 年，中国通号认真贯彻党中央、国务院关于定点帮扶决策部署及工作要求，以高度使命感和责任感统筹推进乡村振兴工作，成立定点帮扶工作领导小组，构建立体帮扶体系，连续 19 年做好河南省社旗县定点帮扶，打造乡村振兴的“社旗样板”。2022 年，中国通号投入乡村振兴帮扶资金 581 万元，累计投入无偿帮扶资金 2,637.52 万元。

In 2022, CRSC earnestly implemented the decision-making arrangements and work requirements of the CPC Central Committee and the State Council on targeted assistance, integrated and promoted the rural revitalization work with a high sense of mission and responsibility, established a leading group for designated assistance, built a three-dimensional assistance system, and did a good job in the designated assistance of Sheqi County in Henan Province for the 19 th consecutive year, creating a "Sheqi Model" for rural revitalization. In 2022, CRSC invested RMB5.81 million in rural revitalization assistance and a total of RMB26.3752 million in unpaid assistance.

2022 年
中国通号累计投入无偿帮扶资金
2,637.52 万元
In 2022, CRSC investeda total of RMB26.3752 million in unpaid assistance

中国通号 2022 年助力社旗县乡村振兴“成绩单”
CRSC's Rural Revitalization Deed to Help Sheqi County in 2022

指标 Indicator	2022 年目标 Objective 2022	达成情况 Completion	年度计划完成度 Annual plan completion
投入帮扶资金（万元） Non-reimbursable assistance funds invested (RMB10,000)	200	550	275%
引入无偿帮扶资金（万元） Non-reimbursable assistance funds attracted (RMB10,000)	10	10	100%
培训基层干部 （名） The number of grassroots cadres trained (Person)	100	121	121%
培训乡村振兴带头人（名） Training village revitalization leaders (Person)	100	101	101%
培训专业技术人才（名） For professional and technical personnel (Person)	100	123	123%
购买农产品 （万元） Agricultural products purchased (RMB10,000)	100	> 147	> 147%
帮助销售农产品（万元） Agricultural products sold (RMB10,000)	50	> 571	> 1142%

助力“五大振兴”
Help the "Five Major Revitalizations"

- 引进河南省锐垦农业发展有限公司、金方源中药饮片二期项目、俊发仓储设备制造项目，实际投资额达 1.7 亿元

  CRSC introduced Henan Ruiken Agricultural Development Co., Ltd., Jinfangyuan TCM Decoction Pieces Phase II Project and Junfa Storage Equipment Manufacturing Project, with an actual investment of RMB170 million.

- 累计投入 125 万元，为烟叶蔬菜育苗、蓝莓种植、养鸡、香菇、中药材加工等产业建设基础设施，带动就业，提高农户收入

  CRSC has invested a total of RMB1.25 million to build infrastructure for tobacco and vegetable seedling raising, blueberry planting, chicken raising, mushrooms, TCM material processing and other industries, which drives employment and increases farmers' income.

2022 年
公司引进仓储设备制造项目，实际投资额达
1.7 亿元
In 2022, CRSC introduced Equipment Manufacturing Project with an actual investment of RMB170 million

- 修缮太和镇烈士陵园和闫店岗王陆庄红九军烈士陵园

  CRSC renovated the Martyrs' Cemetery in Taihe Town and the Martyrs' Cemetery for Ninth Corps of the Red Army in Wangluzhuang, Yandiangang Village.

- 维护新建红三军烈士纪念广场

  CRSC maintained the Martyrs Memorial Square for Third Corps of the Red Army.

- 共建饶良镇党史馆，用“红色力量”推动乡村振兴

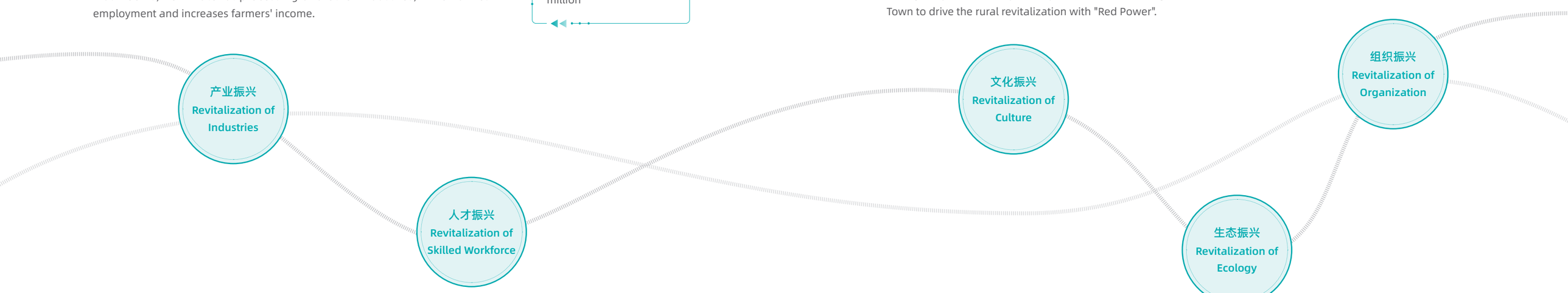
  CRSC jointly built a Party History Museum in Raoliang Town to drive the rural revitalization with "Red Power".

- 积极开展党建共建活动

  CRSC actively launches various Party building and co-construction activities.

- 属地驻豫企业党委所属支部与社旗县贫困村党支部，签订党建共建协议，在夯实党建基础、协助制度建设、群团活动等方面持续开展结对子帮扶

  The branch of the Party Committee of the local enterprise in Henan and the Party branch of the poverty-stricken village in Sheqi County signed an agreement on party building and cow-construction, to continue to carry out pairing assistance in consolidating the foundation of Party building, assistance system construction, and mass group activities.





- 开发乡村人力资源，举办乡村基层干部专题培训班、基层干部软弱涣散村整顿工作专题培训班、农村创业致富带头人及技术人员培训班等活动

  CRSC develops rural human resources, organizes special training courses for rural grassroots cadres, special training courses for the consolidation of weak and lax villages for grassroots cadres, and training courses for rural entrepreneurial leaders and technicians.

- 系统培训乡村基层干部、乡村振兴致富带头人、农业技术人员

  CRSC systematically trains rural cadres at the grassroots level, leaders in rural revitalization and prosperity, and agricultural technicians.



- 购买 6,000 棵红玉兰和月季，用于建设森林村庄示范点，改善人居环境

  CRSC purchased 6,000 plants of Magnolia liliflora and Chinese roses to build a forest village demonstration base to improve the living environment.

- 建设“中国通号朱集镇袁老庄文化生态村”，增设治污设施、村庄道路、文化游园

  CRSC built "CRSC Yuanlaozhuang Cultural Ecological Village in Zhuji Town" with additional pollution control facilities, village roads and cultural parks.

- 治理太和镇刘集村 2 座坑塘，有效改善当地群众生产生活

  CRSC governed 2 pit-ponds in Liuji Village, Taihe Town, effectively improving the production and living of locals.

创新长效机制
Innovate Long-term Mechanism

巩固“两不愁三保障”成果
Consolidate the Achievements of "Two Worries, Three Guarantees"

- 对脱贫不稳定户和因病因灾致困群体加大帮扶支持力度，累计帮扶慰问特殊群众 21 名，发送慰问金 8 万元

  CRSC steps up its support for unstable households out of poverty and groups suffering from diseases and calamities, and has allocated RMB80,000 as the solatium in support of 21 special people.

- 向饶良镇丁庄卫生院捐赠 8 台测温仪，向抗疫最前沿的朱集镇捐赠 5 万元抗疫物资

  CRSC donated 8 thermometers to the Dingzhuang Health Center in Raoliang Town and RMB50,000 of anti-COVID supplies to the anti-COVID forefront of Zhuji Town.

重点扶持
Key Supports

- 持续扶持仿真花产业。截至目前，形成“上下游企业 100 余家、年总产值达 3 亿余元、全县 2,000 余人从事手工加工”的规模，推动社旗县仿真花协会成立

  CRSC continues to support artificial flower industry. Up to now, it has formed the scale of "more than 100 upstream and downstream enterprises, with an annual gross output of more than RMB300 million, and more than 2,000 county-wide locals engaged in hand finishing", promoting the establishment of Sheqi County Artificial Flower Association.



中国通号向社旗县捐赠科技兴农专项基金 350 万元

CRSC donates RMB3.5 million of special fund for developing agriculture through science and technology to Sheqi County

科技帮扶
Scientific and Technological Assistance

- 推进科技兴农战略，全资设立中国通号社旗县科技兴农专项基金，计划每年滚动投入 350 万元专项资金，用于对社旗县科技创新企业的扶持，发挥引领导向示范作用

  Driven by the strategy of promoting agriculture by applying scientific and technological advances, CRSC has set up the special fund for science and technology to promote agriculture in Sheqi County, and plans to invested RMB3.5 million as special fund each year to support science and technology innovation enterprises in Sheqi County, expecting to play a leading, guiding and demonstrating role.

消费帮扶
Assistance through Consumption

- 依托央企消费帮扶电商平台，积极参加“央企消费帮扶兴农周”活动，购买脱贫地区农产品总金额位列中央企业第 56 名

  Relying on the e-commerce platforms assisted by central enterprises, CRSC actively participated in the "Central Enterprises' Consumption Assistance and Agriculture Promotion Week" and ranked 56th among central enterprises in the total amount of agricultural products purchased from poverty-stricken areas.

- 遴选一批具有良好帮扶成效的商铺，推选至央企消费帮扶电商平台的社旗县专馆，拓宽当地加工企业和农业合作社销售渠道

  CRSC has selected a number of shops with good assistance results and elected them to the Sheqi County Special Shop of the central enterprises' consumption-assisted e-commerce platform, broadening the sales channels of local processing enterprises and agricultural cooperatives.

- 挂职副县长黄远芳化身“助农带货主播”、联合大型直播间，销售滞销农产品 571 余万元

  Huang Yuanfang, the temporary deputy county magistrate, acted as "Live Streaming E-commerce Anchor Helping Farmers " and sold more than RMB5.71 million of unsalable agricultural products by working with a large-scale live streaming studio.



中国通号挂职副县长黄远芳（左二）为社旗县滞销农产品直播带货

Huang Yuanfang (second from left) from CRSC, the temporary deputy county magistrate, is selling unsalable agricultural products in Sheqi County by live streaming

所属企业联合帮扶
Joint Assistance by Affiliated Enterprises

中国通号广泛发动所属企业结合驻地乡村发展情况，抽调“精兵强将”、投入“真金白银”，采取结对帮扶、消费帮扶、教育帮扶、就业帮扶等行之有效的多种举措，助力脱贫地区经济发展，着力构建覆盖全系统、多方齐参与、优势能互补的立体帮扶机制。

The CRSC has widely mobilized its affiliated enterprises to deploy "good soldiers and elite generals", make great investments, and take various effective measures such as pairing assistance, consumption assistance, education assistance and employment assistance, to boost the economic development of the poverty-stricken areas and focus on building a three-dimensional assistance mechanism that covers the whole system, involves multiple parties and has complementary advantages.



上海工程局集团帮扶云南省保山市瓦房乡保和小学，开展“心连心同献爱心”活动

Shanghai Engineering Group helped the Baohe Primary School in Wafang Township, Baoshan City, Yunnan Province and carries out the "Heart To Heart Caring" Campaign

开展志愿服务
Carrying out Volunteering Services

中国通号大力弘扬“奉献、友爱、互助、进步”的志愿精神，推动“同心筑梦”志愿服务队、“利剑”青年志愿服务队等爱心团队扎根一线，积极参与助学敬老、关爱慰问、无偿献血、环境保护等社会公益活动，以热心融入公益事业，以暖心热忱回馈社会。

CRSC vigorously carries forward the voluntary spirit of "dedication, fraternity, mutual assistance and advancement", and promotes the caring teams such as "Dream-building" volunteering service team and "Sword" youth volunteering service team to take root on the anti-COVID frontline. Those teams actively participated in social public welfare activities such as helping students and caring for the elderly, caring and condolence, voluntary blood donation, and environmental protection. They integrated enthusiastically into public welfare undertakings and gave back to the society with warm hearts and enthusiasm.

- 在“雷锋月”期间，走进希望小学，开展以“爱满京城”为主题的学习雷锋日活动

  During the "Lei Feng Month" activities, CRSC arranged the visits to a Hope Primary School to carry out the activities of learning Lei Feng Day with the theme of "Capital Full of Love".

- 持续为北京冬奥会和冬残奥会、上海地铁安全稳定运行保驾护航，连续五年用心守护上海进博会期间轨道交通安全

  CRSC continues to escort the safe and stable operation of the Beijing Winter Olympics, Winter Paralympic Games, and the Shanghai subway. It has been guarding the safety of rail transit for Shanghai-based China International Import Expo for five consecutive years.

- 妥善应对地震、火灾等险情，参与列车脱线救援

  CRSC has properly addressed dangerous conditions such as earthquakes and fires, and has participated in derail rescue of trains.

- 时刻绷紧防灾减灾责任弦，迎“梅花”、战水患，突出表现被中国网、中国日报网等媒体转载报道，彰显央企青年的责任与担当

  CRSC has always been on the alert for disaster prevention and mitigation, such as "Muifa" and fought against floods. Its outstanding performance has been reprinted and reported by media such as china.com.cn and Chinadaily.com.cn, highlighting the responsible and accountable youth of central enterprises.



中国通号青年志愿者走进科学宫，为小朋友演示趣味实验，讲解科学知识

CRSC youth volunteers visits the Science Palace to demonstrate interesting experiments and explain scientific knowledge to children



通号工程局集团驰援 D2809 次列车脱线救援工作

Engineering Group rushes to assist derail rescue of Train No. D2809



中国通号开展“弘扬志愿精神 争做环境卫士”活动，维护社区卫生环境

CRSC launches the "Promotion of Voluntary Spirit and To Be an Environmental Guard" campaign to safeguard the community health environment



中国通号青年志愿者队伍开展宣传活动，倡导“健康饮食 厉行节约 拒绝浪费”

The CRSC youth volunteer team launches a publicity campaign to advocate "Healthy Diet, High Thrift and No Waste"

未来展望
Future Outlook

“踔厉奋发开新局，笃行不怠谱新篇”。2023 年，中国通号将进一步发挥中央企业的榜样引领作用，全面提升企业治理水平、创新能力、质量效益、品牌价值和国际影响力，进一步增强抗风险能力、竞争力、创新力、控制力和影响力，大力推动轨道交通行业高质量发展，为践行“双碳”战略、落实“一带一路”倡议和高铁“走出去”提供核心技术支撑，以更高质量和更高水平的企业发展活力积极助力交通强国建设，为全面建设社会主义现代化国家做出新的更大贡献！

"Make full efforts to create a new era and make earnest practice to write a new chapter". In 2023, CRSC will further play the exemplary leading role as a central enterprise, comprehensively enhance corporate governance, innovation capability, quality and efficiency, brand value and international influence, further enhance risk resistance, competitiveness, creativity, control power and influence. We will vigorously promote the high-quality development of the rail transit industry, provide core technical support for the "carbon peaking and carbon neutrality" strategy, "the Belt and Road Initiative" and the "going global" of high-speed rail, so as to actively assist the construction of a country with strong transportation network featuring higher-quality and higher-level enterprise development vitality, and make new and greater contributions to the overall construction of a great modern socialist country.

附录 Appendix

ESG 指标索引 HKEX ESG Reporting Guide

指标披露 General Disclosures and KPIs		页码 Page No.
范畴：环境 A: Environment		
A1：排放物 Aspect A1: Emissions		
一般披露 General disclosure		P54、P57、P60-P62
A1.1	排放物种类及相关排放数据 The types of emissions and respective emissions data	P57-P62
A1.2	直接（范围 1）及能源间接（范围 2）温室气体排放量（以吨计算）及（如适用）密度（如以每产量单位、每项设施计算 Direct (scope 1) and indirect energy (scope 2) of greenhouse gas emissions (in tons) and, where appropriate, intensity (e.g. per unit of production volume, per facility)	P57
A1.3	所产生有害废弃物总量（以吨计算）及（如适用）密度（如以每产量单位、每项设施计算） Total hazardous waste produced (in tons) and, where appropriate, intensity (e.g. per unit of production volume, per facility)	P62
A1.4	所产生无害废弃物总量（以吨计算）及（如适用）密度（如以每产量单位、每项设施计算） Total non-hazardous waste produced (in tons) and, where appropriate, intensity (e.g.per unit of production volume, per facility)	P62
A1.5	描述所订立的排放量目标及为达到这些目标所采取的步骤 Describe emission targets set and the steps taken to achieve these goals	P57-P62
A1.6	描述处理有害及无害废弃物的方法及描述所订立的减废目标及为达到这些目标所采取的步骤 Description of how hazardous and non-hazardous wastes are handled, the waste reduction goals set and the steps taken to achieve these goals	P57-P62
A2：资源使用 Aspect A2: Use of resources		
一般披露 General disclosure		P54-P57
A2.1	按类型划分的直接及／或间接能源（如电、气或油）总耗量（以千个千瓦时计算）及密度（如以每产量单位、每项设施计算） 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)	P55
A2.2	总耗水量及密度（如以每产量单位、每项设施计算） Water consumption in total and intensity (e.g. per unit of production volume, per facility)	P55
A2.3	描述所订立的能源使用效益目标及为达到这些目标采取的步骤 Description of energy use efficiency initiatives and steps taken to achieve these targets	P54-P57
A2.4	描述求取适用水源上可有任何问题，以及所订立的用水效益目标及为达到这些目标所采取的步骤 Description of issues (if any) in sourcing water that is fit for purpose, water use efficiency initiatives and steps taken to achieve these targets	P54
A2.5	制成品所用包装材料的总量（以吨计算）及（如适用）每生产单位占量 Total packaging material used for finished products (in tons) and, if applicable, with reference to per unit produced	P55
A3：环境及天然资源 Aspect A3: Environment and natural resources		
一般披露 General disclosure		P54
A3.1	描述业务活动对环境及天然资源的重大影响及已采取管理有关影响的行动 Description of the significant impacts of activities on the environment and natural resources and the actions taken to manage them	P54
A4. 气候变化 Aspect A4: Climate Change		
一般披露 General disclosure		P57-P59
A4.1	描述已经及可能会对发行人产生影响的重大气候相关事宜，及应对行动 Description of the significant climate issues that have and may affect the issuer, and actions taken to address them	P57-P59
范畴：社会 B: Society		
雇佣及劳工准则 Employment and Labor Standards		
B1：雇佣 Aspect B1: Employment		
一般披露 General disclosure		P65-P66
B1.1	按性别、雇佣类型（如全职或兼职）、年龄组别及地区划分的雇员总数 Total workforce by gender, employment type (e.g. full-time or part-time), age group and geographical region	P66
B2：健康与安全 Aspect B2: Health and safety		
一般披露 General disclosure		P51-P53、P68
B2.1	过去三年（包括汇报年度）每年因工亡故的人数及比率 Number and rate of work-related fatalities in the past three years (including the reporting year)	P68
B2.3	描述所采纳的职业健康与安全措施，以及相关执行及监察方法 Description of occupational health and safety measures adopted, how they are implemented and monitored	P51-P53、P68

指标披露 General Disclosures and KPIs		页码 Page No.
B3：发展及培训 Aspect B3: Development and training		
一般披露 General disclosure		P70-P74
B3.1	按性别及雇员类别（如高级管理层、中级管理层）划分的受训雇员百分比 The percentage of employees trained by gender and employee category (e.g. senior management, middle management)	P73
B3.2	按性别及雇员类别划分，每名雇员完成受训的平均时数 The average training hours completed per employee by gender and employee category	P73
B4：劳工准则 Aspect B4: Labor guidelines		
一般披露 General disclosure		P66-P67
B4.1	描述检讨招聘惯例的措施以避免童工及强制劳工 Description of measures to review employment practices to avoid child and forced labor	P66-P67
B4.2	描述在发现违规情况时消除有关情况所采取的步骤 Description of steps taken to eliminate such practices when discovered	P66-P67
运营管理 Operational practices		
B5：供应链管理 Aspect B5: Supply chain management		
一般披露 General disclosure		P80-P82
B5.1	按地区划分的供货商数 Number of suppliers by geographical region	P82
B5.2	描述有关聘用供货商的惯例，向其执行有关惯例的供货商数目，以及有关相关执行及监察方法 Description of practices relating to engaging suppliers, number of suppliers where the practices are being implemented, how they are implemented and monitored	P80-P81
B5.3	描述有关识别供应链每个环节的环境及社会风险的惯例，以及相关执行及监察方法 Description of practices relating to identifying environmental and social risks at each link of the supply chain, how they are implemented and monitored	P80-P81
B5.4	描述在拣选供应商时促使多用环保产品及服务的管理，以及相关执行及监察方法 Description of management promoting the use of environmental products and services in selecting selection, how they are implemented and monitored	P80-P81

指标披露 General Disclosures and KPIs		页码 Page No.
B6：产品责任 Aspect B6: Product responsibility		
一般披露 General disclosure		P47-P51
B6.2	接获关于产品及服务的投诉数目以及应对方法 Number of products and service-related complaints received and how they are dealt with	P47
B6.3	描述与维护及保障知识产权有关的惯例 Description of practices relating to observing and protecting intellectual property rights	P39
B6.4	描述质量检定过程及产品回收程序 Description of quality assurance process and recall procedures	P48-P49
B6.5	描述消费者资料保障及私隐政策，以及相关执行及监察方法 Description of consumer data protection and privacy policies, implementation and monitoring methods	P47-P51
B7：反贪污 Aspect B7: Anti-corruption		
一般披露 General disclosure		P32-P33
B7.1	于汇报期内对发行人或其雇员提出并已审结的贪污诉讼案件的数目及诉讼结果 Number of concluded legal cases regarding corrupt practices brought against the issuer or its employees during the reporting period and the outcomes of the cases	P32
B7.2	描述防范措施及举报程序，以及相关执行及监察方法 Description of preventive measures and whistle-blowing procedures, how they are implemented and monitored	P32-P33
B7.3	描述向董事及员工提供的反贪污培训 Description of the anti-corruption training provided to directors and staff	P32-P33
社区 Community		
B8：社区投资 Aspect B8: Community investment		
一般披露 General disclosure		P82-P89
B8.1	专注贡献范畴（如教育、环境事宜、劳工需求、健康、文化、体育） Focus areas of contribution (e.g. education, environmental concerns, labor needs, health, culture, sport)	P82-P89
B8.2	在专注范畴所动用资源（如金钱或时间） Resources contributed (e.g. money or time) to the focus area	P82-P89

评级报告

《中国铁路通信信号股份有限公司 2022 环境、社会及管治报告》评级报告

受中国铁路通信信号股份有限公司委托，“中国企业社会责任报告评级专家委员会”抽选专家组成评级小组，对《中国铁路通信信号股份有限公司 2022 环境、社会及管治报告》（以下简称《报告》）进行评级。

一、评级依据

中国社会科学院《中国企业社会责任报告指南（CASS-ESG 5.0）》暨“中国企业社会责任报告评级专家委员会”《中国企业 ESG 报告评级标准（2023）》。

二、评级过程

1. 评级小组审核确认《报告》编写组提交的《企业 ESG 报告过程性和可及性评估资料确认书》及相关证明材料；
2. 评级小组对《报告》编写过程及内容进行评价，拟定评级报告；
3. 评级专家委员会副主席、评级小组组长、评级小组专家共同签审评级报告。

三、评级结论

过程性（★★★★☆）

公司成立报告编制工作组，由党群工作部牵头协调、具体统筹报告编制工作，党委会、董事会把控报告内容、整体方向并负责报告终审；报告所引用的信息和数据客观、真实，已通过董事会确认；将报告定位为合规披露履责信息、规范公司治理、回应资本市场诉求、强化利益相关方沟通、提升品牌形象的重要工具，功能价值定位明确；结合国家宏观政策、国际国内 ESG 标准、公司发展战略、利益相关方调查等识别实质性议题，过程性表现领先。

实质性（★★★★★）

《报告》系统披露了完善 ESG 治理、服务国家战略、节约能源和资源、产品技术创新、产品质量管理、保护知识产权、安全生产、员工健康与安全、员工发展与培训、可持续供应链等所在行业关键性议题，叙述详细充分，实质性表现卓越。

完整性（★★★★☆）

《报告》主体内容从“理念篇：心之所往，弘扬责任文化”“管理篇：信之所倚，夯实责任基础”“实践篇：行之所至，书写责任担当”等角度系统披露了所在行业核心指标的 88.55%，完整性表现领先。

平衡性（★★★★★）

《报告》披露了“腐败相关诉讼事件”“舞弊诉讼案件”“质量责任事故”“生产安全一般及以上责任死亡事故”“特种设备一般及以上责任事故”“工程质量一般及以上责任事故”“因工亡故人数”“职业病及职业中毒等事故”等负面数据，并简述针对企业安全生产隐患、不良行为供应商的整改情况，具有卓越的平衡性表现。

可比性（★★★★★）

《报告》披露了“年度研发投入”“新增授权专利”“产品合格率”“综合能源消耗量”“女性员工人均培训时长”“境外公开开展项目”等 54 个关键指标连续 3 年的对比数据，强调了使用一致的披露统计方法，并对“温室气体（二氧化碳）排放量”等核心指标的统计口径进行说明；通过“中国铁道学会通信信号分会连续 3 年获得中国铁道学会分支机构考核第一名”“购买脱贫地区农产品总金额位列中央企业第 56 名”进行横向比较，可比性表现卓越。

可读性（★★★★★）

《报告》创新采用“理念篇”“管理篇”“实践篇”的特色框架结构，框架结构清晰，重点议题突出，回应了利益相关方的期望与诉求；结合公司实际，提出“从三个方面持续加强 ESG 工作”的要求，彰显了企业履责的引领性和报告的时代感；封面设计采用概念风格，充分融入主业元素，提升了报告的行业辨识度和感染力；设计风格简洁，以直观对比图方式凸显履责成效，多采用简笔画勾勒元素图形，显著增强报告的可读性，可读性表现卓越。

可及性（★★★★☆）

《报告》是中国通号发布的第三份 ESG 报告，与年报发布时间间隔预计在 1 个月以内；拟在公司官网、交易所网站挂网发布，并利用官微等社交渠道传播；可通过网络搜索下载、邮寄等渠道获取报告，可及性表现领先。

综合评级（★★★★★）

经评级小组评价，《中国铁路通信信号股份有限公司 2022 环境、社会及管治报告》为五星级，是一份卓越的企业 ESG 报告。

中国企业社会责任报告 评级专家委员会 Chinese Expert Committee on CSR Report Rating

中国通号环境、社会及管治报告连续第三年获得五星级评价

四、改进建议

1. 强化内外利益相关方参与深度，进一步提高报告过程性管理；
2. 增加行业核心指标的披露，进一步提高报告的完整性。

评级专家委员会副主席

评级小组组长　　评级小组专家

出具时间：2023 年 3 月 22 日

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Rating Report

Rating Report of “The 2022 Environment, Social and Governance Report of China Railway Signal & Communication Co., LTD.”

Upon the request of China Railway Signal & Communication Co., LTD., the Chinese Expert Committee on CSR Report Rating invited experts to form a rating team to rate *The 2022 Environment, Social and Governance Report of China Railway Signal & Communication Co., LTD.* (hereinafter referred to as “the report”).

I. Rating Criteria

Guidelines on China's Corporate Social Responsibility Reports (CASS-ESG 5.0) by Chinese Academy of Social Sciences, and *Rating Standards on China's Corporate ESG Reports (2023)* by the Chinese Expert Committee on CSR Report Rating.

II. Rating Process

1. The Rating Panel reviews and confirms *ESG Report Process and Accessibility Materials Confirmation* and supporting documents submitted by the CSR Report Compiling Group;
2. The Rating Panel assesses the preparation process and contents of CSR Report, and drafts the Rating Report;
3. Vice Chairman of China Expert Committee on CSR Report Rating, the Leader and experts of the Rating Panel jointly review and sign the Rating Report.

III. Rating Results

Process (★★★★☆)

The company established a report preparation working group, which was led and coordinated by the party-mass work department; the Party committee and the board of directors controlled the content and overall direction of the report, and were responsible for the final review of the report. The information and data cited in the report are objective and true, and have been confirmed by the board of directors ; the report is positioned as an important tool for complying with disclosure of responsibility information, standardizing corporate governance, responding to capital market demands, strengthening stakeholder communication, and enhancing brand image. In combination with national macro policies, international and domestic ESG standards, the company development strategies, stakeholder surveys, etc., substantive issues are identified, with leading performance in process.

Materiality (★★★★★)

The report systematically discloses key issues in the industry, such as improving ESG governance, serving national strategies, saving energy and resources, product technology innovation, product quality management, protecting intellectual property rights, safe production, employee health and safety, employee development and training, and sustainable supply chain, with sufficient detailed description and excellent materiality performance.

Integrity (★★★★☆)

The main body of the Report systematically disclosed 88.55% of the core indicators of the industry from the perspectives of “Concept: Listen to Our Heart and Carry Forward the Culture of Responsibility”, “Management: Rely on Trust and Build a Firm Foundation of Responsibility”, “Practice: Take Actions and Manifest Corporate Social Responsibilities” , with leading integrity performance.

Balance (★★★★★)

The report disclosed the negative data, including “corruption-related litigation events”, “fraud litigation cases”, “quality liability accidents”, “production safety general and above liability death accidents”, “special equipment general and above liability accidents” , “engineering quality general and above liability accidents” , “number of deaths in work-related injury”, “occupational diseases and occupational poisoning accidents ”, and briefly described the rectification of suppliers for hidden dangers of safe production and bad behaviors of enterprises., with excellent balance performance.

Comparability (★★★★★)

The report disclosed the comparative data of 54 key indicators for three consecutive years, such as “annual R&D investment”, “new authorized patents”, “product qualification rate ”, “comprehensive energy consumption”, “per capita training time for female employees”, “overseas open projects”. It emphasized the use of consistent disclosure statistical methods and explained the statistical caliber of core indicators, such as "greenhouse gas (carbon dioxide) emissions". Through the horizontal comparison of “the Communication and Signal Branch of China Railway Association has won the first place in the branch assessment of China Railway Association for three consecutive years” and “the total amount of agricultural products purchased from poverty-stricken areas ranks 56th among central enterprises”, with excellent comparability performance.

Readability (★★★★★)

The report innovatively adopted the characteristic frame structure of “Concept”,“Management”and “Practice” . The frame structure is clear and the key issues are prominent, which responds to the expectations and demands of stakeholders. Based on the actual situation of the company, this report put forward the requirement of “continuously strengthening ESG work from three aspects”, which highlights the leading role of enterprises in fulfilling their responsibilities and the sense of the times of reporting ; the cover design adopted the concept style, fully integrates the main industry elements, and improved the industry identification and appeal of the report. The design style is simple, and the performance of the responsibility is highlighted by the intuitive comparison diagram. The simple strokes are used to outline the element graphics, which significantly enhances the readability of the report, with excellent readability performance.

Accessibility (★★★★☆)

The report is the 3rd ESG report released by China Railway Signal & Communication Co., LTD., and the annual report is expected to be released within one month. It will be published on the company's official website and exchange website, and spread through social channels such as official wechat. The report can be obtained through Internet search, download, mail and other channels, with good innovativeness performance.

Overall Rating (★★★★★)

The 2022 Environment, Social and Governance Report of China Railway Signal & Communication Co., LTD. was rated as five stars by the rating team. It is an excellent corporate ESG report.

中国企业社会责任报告 评级专家委员会 Chinese Expert Committee on CSR Report Rating

The Environment, Social and Governance Report of Signal & Communication Co., LTD. gained the five-star evaluation for a third consecutive year.

IV. Improvement Suggestions

1. Strengthen the participation depth of internal and external stakeholders, and further improve the reporting process management;
2. Increase the disclosure of industry core indicators to further improve the integrity of the report.

Vice Chairman of China Expert Committee on CSR Report Rating

Panel Leader　　Panel Expert

Date of Issuance: March 22, 2023

Scan the QR code to view the corporate rating files

意见反馈
Feedback



尊敬的读者，您好：

Dear readers,

非常感谢您在百忙之中阅读《中国铁路通信信号股份有限公司 2022 环境、社会及管治报告》。为持续改进中国通号环境、社会及管治工作，我们希望聆听您的意见和建议，请您在百忙之中扫描左侧二维码，对我们的报告提出宝贵意见。

Thank you very much for reading *the 2022 Environmental, Social and Governance report of China Railway Communications Signal Co., Ltd.* during your busy schedule. In order to constantly improve CRSC's environmental, social and governance work, we sincerely hope to get your comments and suggestions regarding this report and our work as well. Please scan the QR code left to offer your constructive comments and suggestions. Thanks for your time and patience!

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