



2024

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.

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五份环境、社会及管治报告，本着客观全面、规范透明的原则，详细阐述 2024 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。

This Report is the fifth 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 2024.

报告范围 Scope of the Report	国务院国资委《关于新时代中央企业高标准履行社会责任的指导意见》 The Guidelines on High-Standard Fulfillment of Social Responsibility by Central State-Owned Enterprises in the New Era by State-owned Assets Supervision and Administration Commission (SASAC) of the State Council 香港联合交易所《环境、社会及管治报告指引》 Environmental, Social and Governance (ESG) Reporting Guide issued by HKEX 《上海证券交易所自律监管指引第 14 号——可持续发展报告（试行）》 Guidelines No. 14 of the Shanghai Stock Exchange for the Self-regulation –Sustainability Report (Trial) 《上海证券交易所上市公司自律监管指南第 4 号——可持续发展报告编制》 Guidelines No. 4 of the Shanghai Stock Exchange for the Self-regulation of Listed Companies -preparation of Sustainability Report 中国社会科学院《中国企业可持续发展报告指南（CASS-ESG 6.0）》 Guidelines on CSustainability Report for Chinese Enterprises (CASS-ESG 6.0) by the Chinese Academy of Social Sciences
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) 联合国可持续发展目标（SDGs） United Nations Sustainable Development Goals (SDGs)

汇报原则 Reporting Principles	本报告遵循《环境、社会及管治（ESG）报告指引》有关“重要性”“量化”“平衡”“一致性”原则的要求，通过 ESG 议题重要性分析回应“重要性”原则，通过量化数据列表和一致的汇报方法回应“量化”和“一致性”原则，通过清晰披露所有成就及改进计划，不偏不倚地呈现公司 ESG 表现。 This Report complies with the materiality, quantitative, balance and consistency principles specified in the requirements of the ESG Reporting Guide. It responds to the materiality principle by conducting material analysis on sustainability issues, meets the quantitative and consistency principles via quantitative data list and consistent reporting methods, and presents the Company's ESG performance impartially by clearly disclosing all achievements and improvement plans.
发布周期 Reporting Cycle	本报告为年度报告，于每年 3 月发布。 This is an annual report released in March.
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”.
报告语言 Reporting language	本报告中英文版本如有歧义，概以中文版为准。 This Report is compiled in Chinese and English versions. Should there be any minor content difference, the Chinese version prevails.

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 2024 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。除特别说明外，本报告均以人民币为金额单位。 All key financial performance data disclosed in this Report are collected from the 2024 Annual Report of China Railway Signal & Communication Co., Ltd., and other data are mainly sourced from internal management systems of the Company. There is no significant adjustment to the scope of disclosure in this Report compared with the ESG reports of the Company in previous years, and consistent disclosure statistical methods are used. Unless otherwise specified, this Report is presented in RMB as the currency unit.
报告获取 Access to the Report	本报告提供纸质版和电子版两种形式。您可以登录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 websites of HKEX and the Shanghai Stock Exchange.

目录

CONTENTS

- 01 关于本报告
About this Report
- 04 董事长致辞
Message from the Chairman
- 06 关于我们
About Us
- 10 中国通号·荣誉2024
Awards and Honors Won by CRSC in 2024
- 16 ESG管理
ESG Management
- 128 未来展望
Future Outlook
- 130 附录
Appendix

01

稳健经营·深化价值创造

Deepening Value Creation through
Stable Operation

- 30 规范公司治理
Standardizing Corporate Governance
- 36 落实风险防控
Implementing Risk Prevention and Control
- 41 党建引领发展
Guiding Development with Party Building
- 44 恪守商业道德
Abiding by Business Ethics
- 47 信息安全与隐私保护
Information Security and Privacy Protection

02

精耕主业·建设世界一流

Building a World-Class Enterprise by Devotedly
Developing Main Business

- 50 追求卓越品质
Pursuing Excellent Quality
- 54 坚守安全生产
Maintaining Work Safety
- 57 强化创新动力
Enhancing Innovation Driving Forces

03

以绿为笔·绘就绿水青山

Painting Lucid Waters and Lush Mountains
Against a Green Background

- 76 全生命周期环境管理
Life-Cycle Environmental Management
- 80 应对气候变化
Addressing Climate Change
- 84 推进节能减排
Promoting Energy Conservation and Emission Reduction
- 93 践行生态保护
Implementing Ecological Protection in Practice

05

深化合作·携手互利共赢

Joining Hands for Mutual Benefit Through
Intensive Cooperation

- 110 拓展战略合作
Expanding Strategic Cooperation
- 113 推动行业发展
Promoting Industry Development
- 114 建设责任供应链
Building a Responsible Supply Chain
- 117 共建“一带一路”
Jointly Building the Belt and Road

04

海纳英才·打造幸福职场

Creating a Happy Workplace to Attract
Talents Globally

- 96 保障员工权益
Protecting Rights and Interests of Employees
- 100 助力员工成长
Supporting Employees in Their Personal Development
- 104 关心关爱员工
Caring about Employees
- 107 展现劳模风采
Showing Charisma of Model Workers

06

担当有爱·守护美好生活

Making Our Lives Better by Fulfilling Social
Responsibilities with Love

- 124 推进乡村振兴
Supporting Rural Revitalization
- 126 参与志愿服务
Participating in Voluntary Service



董事长致辞

Message from the Chairman

董事长 楼齐良
Chairman LOU Qiliang
中国铁路通信信号股份有限公司
China Railway Signal & Communication Co., Ltd.



2024 年，随着中国经济稳中有进，中国通号乘势而上，以习近平总书记 "2·26" 和 "11·6" 重要批示精神为统领，围绕增强核心功能、提升核心竞争力，调整发展战略、凝聚发展共识，奋力攻坚推动战略性新兴产业突破、推动传统产业转型升级、控制不发生重大经营风险 " 三大任务 "，轨道交通产业转型升级焕发新优势，低空经济产业布局取得实质性突破，市政房建业务风险化解稳妥有序推进，产业发展呈现 " 一升、一进、一退 " 新局面，在改革发展、党的建设、绿色低碳、科技创新各方面工作取得新进展、新成绩、新突破。

In 2024, as China's economy maintained steady progress, CRSC seized the momentum and forged ahead under the guidance of President Xi Jinping's important instructions on February 26 and November 6. Focusing on strengthening core functions and enhancing core competitiveness, we have adjusted our development strategy, built consensus, and made concerted efforts to drive breakthroughs in strategic emerging industries, promote the transformation and upgrading of traditional industries, and ensure no major operational risks occur. We have presented the new dynamic through unlocking new advantages in the rail transit industry through transformation and upgrading, achieving substantial breakthroughs in strategic deployment of the low-altitude economy sector, and steadily promoting risk mitigation in the municipal and housing construction business in an orderly manner. We have also achieved new progress, new milestones, and new breakthroughs in reform and development, Party building, green and low-carbon initiatives, and technological innovation.

过去一年来，中国通号将可持续发展理念更加深入地融入企业发展战略规划，更好地践诺 " 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 " 的使命愿景，不断为环境和社会带来积极影响。

Over the past year, We have further integrated the concept of sustainable development into our corporate development strategy and planning, reinforced our commitment to the mission and vision of "advancing national train control technology and domestic industry, leading global rail transit technology progress, and ensuring safe and efficient travel," and achieved positive impacts on both the environment and society.

我们有效支撑产业发展需要。推动聚焦轨道交通和低空经济 " 双赛道 "，加快构建低空经济 " 三业一态 " 产业格局；自主研发低空空域管控系统 ID-Space 1.0 版，入选 " 百大工程 " 项目，成功申报 " 北京市重点实验室 "；获批成为轨道交通安全技术原创策源地，关键核心技术攻关稳步推进，加入国家自然科学基金委铁路基础研究联合基金，组建中国城市轨道交通协会标准化技术委员会通信信号分技术委员会，2 名专家成功入选中央企业 " 百 " 名顶尖科技人才培养计划。

We have effectively supported the needs of industrial development. We have focused on the dual track of rail transit and low-altitude economy and accelerated the establishment of a low-altitude economy ecosystem through low-altitude airspace management, UAV manufacturing, and service operations. We have independently developed the ID-Space 1.0 low-altitude airspace management system, which was selected as one of the "Top 100 Projects," and successfully applied for recognition as a Key Laboratory of Beijing. We have been approved as the origin of core technologies in rail transit safety control, with steady progress in key technological breakthroughs. We have joined the National Natural Science Foundation's Railway Basic Research Joint Fund and established the Communications and Signal Sub-Technical Committee under the Standardization Technical Committee of China Association of Metros. Two of our experts have been successfully selected for the Central Enterprise "Top 100" Technology Talent Development Program.

我们持续增强安全支撑保障能力。深入实施安全生产治本攻坚三年行动，全力做好国家重大项目建设和轨道交通运行安全支撑保障，为我国 4.8 万公里高速铁路、16.2 万公里铁路提供运行控制核心技术支撑，保障全路开行的动车组和客货运列车安全运行；加强战略储备和产业配套协同，加大集中采购和联合集采力度，确保产业链供应链安全稳定；我们高标准做好在轨运营设备应急保障工作，高质量完成国家重大节假日和重要活动期间轨道交通工程服务保障任务，凸显央企责任担当。

We have continued to enhance our safety support and guarantee capabilities. We have implemented the three-year action plan to tackle the root causes of production safety and ensured the safety of major national projects and rail transit operations. This includes providing core operational control technology support for China's 48,000 kilometers of high-speed rail and 162,000 kilometers of rail to ensure the safe operation of all trains, including high-speed trains and freight/passenger trains. We have strengthened strategic reserves and industry coordination and increased efforts in centralized and joint procurement to ensure the stability and security of the industrial and supply chains. We have maintained high standards in emergency support for rail operation equipment and successfully completed the rail transit engineering service support tasks during major national holidays and important events, demonstrating the responsibility and commitment of a central enterprise.

我们加快推进绿色发展。以落实碳达峰方案为主线，完善节能环保管理体系建设，推进能源绿色低碳转型和能源体系调整，加强绿色低碳基础设施建设，积极探索数字技术提升能效。在节能环保、污染治理、监督检查及环保宣传方面持续发力，有效防范和化解环境风险，推行绿色制造、绿色建造，推动 " 绿色转型，节能攻坚 " 行稳致远，公司万元产值（收入）二氧化碳当量排放同比下降 3.21%。

We have stepped up efforts to promote green development. With the implementation of the carbon peak plan as the main line, we have improved the construction of the energy-saving and environmental protection management system, promoted the green and low-carbon transformation of energy, and adjusted the energy system. We have strengthened the construction of green and low-carbon infrastructure and actively explored the use of digital technologies to enhance energy efficiency. We have continued to focus on energy conservation and environmental protection, pollution control, supervision and inspection, and publicity for environmental protection, effectively preventing and resolving environmental risks. We have promoted green manufacturing and green construction, driving "green transition, energy-saving endeavors" toward steady and long-term progress. As a result, the carbon dioxide equivalent emissions per ten thousand yuan of output (revenue) has decreased by 3.21% compared to the previous year.

未来，面对新的机遇和挑战，我们将以习近平新时代中国特色社会主义思想为指引，牢牢把握高质量发展这个首要任务，围绕中国通号打造智能控制领域的 " 大国重器 " 总目标，聚焦 " 轨道交通 + 低空经济 " 2 条主赛道，坚定战略自信，把握战略主动，统一思想，团结奋进，为加快建设具有全球影响力的世界一流企业不懈奋斗。

In the future, in the face of new opportunities and challenges, we will be guided by Xi Jinping Thought on Socialism with Chinese Characteristics for a New Era and firmly focus on high-quality development as our top priority. We will focus on the overarching goal of making CRSC a leading player in the intelligent control field and the two main tracks of rail transit and low-altitude economy. We will strengthen our strategic confidence, seize strategic initiative, unify our thoughts, and work together in unity to relentlessly strive towards accelerating the creation of a world-class enterprise with global influence.

最后，我谨代表中国通号董事会及全体员工，向长期以来给予我们信任、支持与指导的合作伙伴、各界友人致以最诚挚的感谢。站在新的历史起点，我们将继续秉持初心、深耕厚植，期待与诸位继续同心同向，为书写中国式现代化时代新篇作出更大贡献！

Finally, on behalf of the board of directors and all employees of CRSC, I would like to express our sincere gratitude to our partners and friends from all walks of life who have long trusted, supported, and provided guidance for us. Standing at a new historical starting point, we will continue to stay true to our original aspirations and deepen our efforts. We look forward to working together with all of you to make even greater contributions to writing a new chapter in the era of Chinese modernization.

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及系统标准化技术委员会通信信号分技术委员会（国家标准）、铁路行业电气设备及系统标准化通信信号分技术委员会（行业标准）、中国铁道学会标准化委员会通信信号专委会（铁路团体标准）秘书处单位，负责归口管理通信信号领域国家标准、铁路行业标准和团体标准。

China Railway Signal & Communication Co., Ltd. (hereinafter referred to as "CRSC" or the "company") is a high-tech industry service provider specializing in rail transit control technologies. It is a leader in China's rail transit control industry and a world-class supplier of rail transit control systems. The company has a complete industrial chain that integrates the design, research and development, equipment manufacturing, and installation of rail transit control systems. CRSC is a secretariat member of the Communication and Signal Sub-Committee under the National Technical Committee on Electrical Equipment and Systems for Railways of the Standardization Administration of China (national standard), the Communication and Signal Sub-Committee under the Railway Industry's Technical Committee on Standardization of Electrical Equipment and Systems (industry standard), and the Communication and Signal Special Committee under the Standardization Committee of the China Railway Society (railway group standard). In these roles, CRSC is responsible for the centralized management of national standards, railway industry standards, and group standards in the field of communication and signal.

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 the Hong Kong Exchanges and Clearing Limited (HKEX: 03969). On July 22, 2019, CRSC was listed on the STAR Market of the Shanghai Stock Exchange (SSE: 688009). It became the first central SOE and the first A+H company on the SSE STAR Market

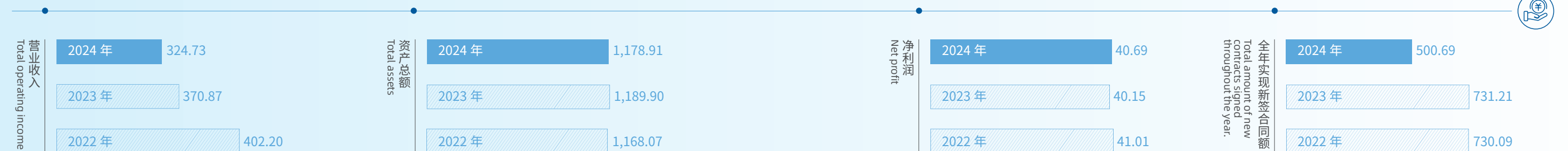
发展战略 Development Strategy

坚持以智能控制技术优势为基础，聚焦轨道交通和低空经济“双赛道”，巩固拓展轨道交通“四电”业务工程设计、装备研制、工程服务“三位一体”全产业链优势，加快构建低空空域管控、无人机制造、服务运营“三业一态”产业格局，推动产业结构转型升级。

CRSC emphasizes its technological superiority in intelligent control and focuses on the "dual-track" growth of rail transit and the low-altitude economy. CRSC aims to consolidate and expand its "three in one" advantages in the design of the "four categories of electronic & electrical projects" (communication engineering, signal engineering, power engineering, and electrification engineering projects), as well as in R&D of equipment and engineering services across the entire value chain of the rail transit industry. Moreover, CRSC will accelerate the development of a "three business lines under one model" framework (which includes low-altitude airspace control, unmanned aerial vehicle manufacturing, and related service offerings) to foster the growth of the low-altitude economy and promote industrial structural transformation and upgrading.



经济绩效（单位：亿元）
CRSC Economic Performance (Unit: CNY 100 million)



远景目标 Long-term goals

到 2035 年，建成以智控技术为特色、聚焦轨道交通和低空经济“双赛道”、具有全球竞争力的世界一流高科技产业集团。

CRSC aims to establish a world-class high-tech industrial group with global competitiveness, characterized by intelligent control technology and focused on the dual tracks of rail transit and the low-altitude economy.



发展战略 Development strategy

坚守主责、创新引领、注重质量、多业协同，牢牢把握“三个总”，切实用好“两个途径”，充分发挥“三个作用”，实施“12335”战略。即：坚持以智控为根技术；聚焦轨道交通和低空经济“双赛道”；坚持巩固拓展轨道交通“三位一体”全产业链优势；培育低空经济“三业一态”产业格局；增强服务国家重大战略功能，强化科技创新主体地位，发展新质生产力，打造“5个通号”，建设具有全球竞争力的世界一流高科技产业集团。

Adhere to the main responsibility, take the lead in innovation, focus on quality, and promote the coordinated development of all business domains. Stick to the "three overall" (overall goals, overall principles, and overall requirements). Effectively implement the "two approaches" (enhancing core competitiveness and strengthening the core functions of SOEs.) Fully leverage the "three roles" in technological innovation, industrial control, and security support. Implement the "12335 Strategy." Which involves: adhering to the principle of taking intelligent control as the core technology; focusing on the "dual-track" development of rail transit and the low-altitude economy; consolidating and expanding the "three-in-one" advantages across the entire rail transit industry; developing the "three business lines under one model" framework for creating the low-altitude economy business; enhancing major strategic functions to serve the country; strengthening the role of the main scientific and technological innovator; developing new high-quality productive forces by following the "five strategic directions." This will contribute to the creation of a world-class, high-tech industrial group with global competitiveness.

“12335” 战略 "12335" Strategy

- 以智控为根技术，拓宽“智控+N”的产业路径，形成技术发展同心

Take intelligent control as the core technology, enrich the "intelligent control + N" business development roadmap, and create a convergent technological development path.
- 聚焦轨道交通和低空经济“双赛道”，拓展发展半径

Focus on the "dual track" development of rail transit and the low-altitude economy to expand the development radius.
- 在轨道交通领域，服务国家重大战略，保障轨道交通运营安全，积极提升运输效率，加快发展智慧交通，打造运控、运维平台，巩固轨道交通“四电”业务工程设计、装备研制、工程服务“三位一体”全产业链优势

In the rail transit sector, support major national strategies, ensure the safety of rail transit operations, and actively improve transportation efficiency. Accelerate the development of smart transportation and create operation control and maintenance platforms. Consolidate the "three in one" advantages in the design of the "four categories of electronic and electrical projects," the R&D of operation control system equipment, and engineering technology services across the entire rail transit industry value chain.
- 在低空经济领域，积极培育战略性新兴产业，以技术创新为引领，建立低空空域管控、无人机制造、服务运营“三业一态”发展格局，打造新经济新业态新模式，有效降低全社会物流成本

In the field of low-altitude economy, actively cultivate strategic emerging industries and take technological innovation as the lead. Establish a "three business lines under one model" framework (which includes low-altitude airspace control, unmanned aerial vehicle manufacturing, and related service offering activities) to develop the low-altitude economy business. Create a new economy, business model, and operational mode. Effectively reduce the logistics costs of the entire society.
- 打造科技通号、数字通号、安全通号、活力通号、价值通号

Build CRSC by following the "five strategic directions" aimed at technological innovation, digital transformation, safety enhancement, vitality stimulation, and value creation.

中国通号·荣誉 2024

Awards and Honors Won by CRSC in 2024

- 奖项及认可
Awards and honors
- 颁发机构
Presented by
- 获奖机构
Won by
- 获奖时间
Date



 中国交通运输协会科技奖
一等奖 4 项、二等奖 5 项

Science and Technology Awards of China
Communications and Transportation Association:
4 First Prizes and 5 Second Prizes

研究设计院集团
CRSC Research & Design Institute Group

卡斯柯
CASCO

通信信息集团
CRSC Communication & Information Corporation

中国交通运输协会
China Communications and Transportation Association

2024 年 2 月
February 2024

 城市轨道交通科技进步奖
特等奖 1 项、一等奖 2 项、二等奖 2 项

Urban Rail Transit Technology Progress Awards:
1 Grand Prize, 2 First Prizes, and 2 Second Prizes

研究设计院集团
CRSC Research & Design Institute Group

卡斯柯
CASCO

城交公司
CRSC Urban Rail Transit Technology Co., Ltd.

上海工程局集团
CRSC Shanghai Engineering Bureau Group

中国城市轨道交通协会
China Association of Metros

2024 年 4 月
April 2024

 中国电子学会技术发明二等奖

The Second Prize for Technical Invention of the
Chinese Institute of Electronics

卡斯柯
CASCO

中国电子学会
Chinese Institute of Electronics

2024 年 4 月
April 2024

 2024 “全国工人先锋号”表彰

"National Worker Pioneer 2024"

中国通号研究设计院集团列车运行控制系统基石
攻关团队

CRSC Research & Design Institute Group's Cornerstone
Research Team for Train Operation Control System

中华全国总工会
All-China Federation of Trade Unions

2024 年 5 月
May 2024

 第七届河北省质量创新与质量改进成果
发布会一等奖

The First Prize at the 7th Hebei Provincial Quality
Innovations and Quality Improvement Achievements
Release Conference

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

河北省质量文化协会
Hebei Province Quality Culture Association

2024 年 6 月
June 2024

 “中国 ESG 上市公司先锋 100”榜单，
位列第 17

Ranked 17th on the "ESG Pioneer Top 100 Listed
Companies in China"

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

中央广播电视总台财经节目中心
Financial Programs Center of China Media Group

2024 年 7 月
July 2024

 “中央企业先进基层党组织”称号

"Outstanding Grassroots Party Organization of
Central SOE"

西安工业集团
CRSC Xian Industry Group

国务院国资委
State-owned Assets Supervision and Administration
Commission of the State Council (SASAC)

2024 年 7 月
July 2024

 国务院国资委 2023 年度央企经营业绩
考核 A 级

Rated as Grade A during the performance evaluation
of Central SOEs by SASAC in 2023

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

国务院国资委
State-owned Assets Supervision and Administration
Commission of the State Council (SASAC)

2024 年 7 月
July 2024

● 奖项及认可
Awards and honors

● 获授机构
Won by

● 颁发机构
Presented by

● 获奖时间
Date



“中国 ESG 上市公司京津冀先锋 50(2024)”
位列第 5

Ranked 5th on the "2024 ESG Pioneer Top 50 Listed Companies in the Beijing-Tianjin-Hebei Region"

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

中央广播电视总台
China Media Group

2024 年 9 月
September 2024

2024 中国司库建设标杆企业大奖“司南奖”——
“中央企业司库建设标杆企业”

2024 China Treasury Construction Benchmark Enterprise Award, also known as the "Sinan Award" for Central SOE Treasury Construction Benchmark Enterprise

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

中国司库年会组委会
Organizing Committee of the Chinese Treasury Annual Conference

2024 年 9 月
September 2024

中央企业先进集体和劳动模范表彰大会——“中
央企业先进集体”称号

The title of "Central SOE Outstanding Collective" at the Commendation Conference of Central SOE Outstanding Collectives and Model Workers

通信信息集团研发（西安）中心全域感知项目组
The Full-Situation Awareness Project Team, R&D (Xi'an) Center, CRSC Communication & Information Corporation

国务院国资委、人力资源和社会保障部
SASAC and the Ministry of Human Resources and Social Security

2024 年 10 月
October 2024

财务共享及业财一体化项目获“鼎新杯”全国
数字化转型应用三等奖

The Financial Sharing and Business-Finance Integration Project won the Third Prize at the "Dingxin Cup" National Digital Transformation Application Contest

通信信息集团
CRSC Communication & Information Corporation

工信部中国信息通信研究院和
中国通信标准化协会
The China Academy of Information and Communications Technology (CAICT) under the Ministry of Industry and Information Technology (MIIT) and the China Communications Standards Association

2024 年 10 月
October 2024

第七届中央企业 QC 小组成果发表
The 7th Central State-Owned Enterprises QC Teams
Achievement Presentation Competition

中国铁路通信信号上海工程局集团有限公司 求真
务实 QC 小组《轨道交通隧道辅助定位系统研发》
R&D of the Auxiliary Positioning System for Rail Transit
Tunnels, by Pursue Truth and Practicality QC Team, CRSC
Shanghai Engineering Bureau Group

研究设计院集团 表里如一 QC 小组《PCR 联锁
表比对工具的研制》
Development of a PCR Interlock Table Comparison
Tool, by Consistent Inside and Out QC Team, CRSC
Research & Design Institute Group

中国质量协会
China Association for Quality

2024 年 9 月
September 2024

上交所 2023—2024 年度信息披露工作最高评级
“A” 级评价

The highest rating of "A" for the information disclosure work by the Shanghai Stock Exchange for FY2023-FY2024

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

上海证券交易所
Shanghai Stock Exchange

2024 年 10 月
October 2024

首届“ESAMBER 屹博杯”全国电子制造行业
技能大赛团队优秀奖

Team Excellence Award at the First "ESAMBER Cup" National Electronic Manufacturing Industry Skills Competition

北京铁路信号有限公司
Beijing Railway Signal Co., Ltd.

天津铁路信号有限公司
Tianjin Railway Signal Co., Ltd.

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

电子制造产业联盟
Electronic Manufacturing Industry Alliance

2024 年 11 月
November 2024

中国智能交通协会科学进步奖二等奖

The Second Prize for Scientific Progress of China Intelligent Transportation Systems Association

研究设计院集团
CRSC Research & Design Institute Group

中国智能交通协会
China Intelligent Transportation Systems Association

2024 年 11 月
November 2024

● 奖项及认可
Awards and honors

● 获授机构
Won by

● 颁发机构
Presented by

● 获奖时间
Date



工信部 2024 年物联网赋能行业发展典型案例

MIIT 2024 Typical Cases of IoT Empowering Industry Development in 2024

研究设计院集团

CRSC Research & Design Institute Group

工业和信息化部办公厅

The General Office of the Ministry of Industry and Information Technology (MIIT)

2024 年 11 月

November 2024



全国 QC 小组奖项最高团体荣誉

The highest Group Honor of the National QC Group Awards

中国通号工程局集团北京研究设计实验中心“北斗星 QC 小组”

Beidou Star QC Team, Beijing Research and Design Experimental Center, CRSC Engineering Bureau Group Co., Ltd.

中国质量协会

China Association for Quality

2024 年 12 月

December 2024



2024 年度“IT 新治理”评选活动“财务监督数字化转型年度典型案例”

Typical Case of Financial Supervision Digital Transformation during the "2024 IT-based New Governance" evaluation and selection

中国铁路通信信号集团有限公司

China Railway Signal & Communication Co., Ltd.

中国信息通信研究院

China Academy of Information and Communications Technology (CAICT)

2024 年 12 月

December 2024



2024 中俄工业创新大赛中国赛区二等奖

The Second Prize in the China Division of the 2024 China-Russia Industrial Innovation Competition

通号轨道公司设计团队

The Design Team of CRSC Urban Rail Transit Technology Co., Ltd.

中国工业和信息化部、俄罗斯联邦工业和贸易部、中俄总理定期会晤委员会工业合作分委会

The Ministry of Industry and Information Technology (MIIT), the Ministry of Industry and Trade of the Russian Federation, and the Industrial Cooperation Subcommittee of the China-Russia Prime Ministers' Regular Meeting Committee

2024 年 12 月

December 2024



新华网 2024 数字经济创新优秀案例

xinhuanet.com 2024 Excellent Cases of Digital Economy Innovation

中国铁路通信信号集团有限公司

China Railway Signal & Communication Co., Ltd.

新华网

xinhuanet.com

2024 年 12 月

December 2024



“年度软件和信息技术服务竞争力百强企业”，排名较去年上升 11 位，位列前 50 名

Entered the Top 50 on the list of "Top 100 Enterprises of the Year in Software and Information Technology Service Competitiveness," ranked 11 places higher than the last year

设计研究院集团

CRSC Research & Design Institute Group

中国电子信息行业联合会

China Federation of Electronics and Information Industry (CFEII)

2024 年 12 月

December 2024



中国专利优秀奖

China Patent Excellence Award

卡斯柯

CASCO

国家知识产权局

China National Intellectual Property Administration

2024 年 12 月

December 2024



ESG 管理 ESG Management

ESG 治理体系 ESG management system



中国通号将 ESG 纳入发展战略规划，基于内外部环境和 ESG 管理现状，构建自上而下的 ESG 治理架构和执行体系，积极识别 ESG 管理中的各项风险，有序推进 ESG 目标的落实，推动实现多方共赢的可持续发展。

CRSC has integrated ESG into its development strategy, aiming to establish a top-down ESG management structure and execution system. This system will be based on both internal and external environments, as well as the current ESG management status. The company will actively identify various risks in ESG management, promote the systemic implementation of ESG goals, and drive sustainable development that benefits all stakeholders.

ESG 战略 ESG strategy



中国通号积极践行可持续发展理念，将“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”的使命愿景融入企业战略发展和日常运营中，围绕持续深化责任意识，坚定服务国家战略、服务人民美好生活需要、服务行业可持续发展，制定自身可持续发展战略。

CRSC actively embraces the concept of sustainable development, integrating its mission and vision of "developing national train control technology to foster local industry, leading the technological progress of the global rail transit industry, and providing improved mobility for people" into both its strategic development and daily operations. CRSC formulated its own sustainable development strategy by continuously strengthens its sense of responsibility, dedicates itself to serving the national strategy, meets the people's needs for a better life, and drives the sustainable development of the industry.



使命愿景
Mission & Vision

造就智能运载产业，引领交通现代化，用心守护人们美好生活

Cultivating the intelligent transport industry, leading transportation modernization, and wholeheartedly safeguarding a better life for people.



公司治理
Corporate governance

坚持依法合规诚信经营

Maintain lawful, compliant, and honest operations.

切实加强环境、社会和公司治理（ESG）工作

Effectively enhance environmental, social, and corporate governance (ESG) efforts.

不断提高盈利能力

Continuously improve profitability.



经济责任
Economic responsibility

不断增加优质供给

Continuously increase high-quality supply.

推进自主创新和技术进步

Promote independent innovation and technological advancement.

强化产业引领

Strengthen industrial leadership.



环境责任
Environmental responsibility

加强资源节约和环境保护

Enhance resource conservation and environmental protection.

积极应对气候变化

Take proactive actions against climate change.



社会责任
Social responsibility

支持乡村全面振兴和区域协调发展

Support the comprehensive revitalization of rural areas and promote coordinated regional development.

参与社会公益事业

Take part in public welfare activities.

构建和谐劳动关系

Foster harmonious labor relations.

保障生产安全

Ensure work safety.

ESG 治理架构

Organizational structure for implementing ESG

中国通号充分发挥 ESG 治理的牵引作用，明确各层级的 ESG 管理职责，为公司可持续发展打下坚实基础。
CRSC fully leveraged the driving role of ESG management and clarified ESG management responsibilities at all levels. It also established a solid foundation for the company's sustainable development.

●

决策层
Decision making

董事会
Board of Directors

董事会是公司 ESG 治理的最高决策机构，负责 ESG 事宜的整体规划及工作统筹。
The Board of Directors is the highest decision-making body for the company's ESG implementation. It is responsible for overseeing the overall planning and work coordination of ESG activities.

●

管理层
Management

经营层
Senior executive

制定 ESG 管理政策、方案等，审查 ESG 重要议题，推动 ESG 相关工作实施。
Responsible for developing ESG management policies, strategies, etc., reviewing key ESG issues, and promoting the implementation of ESG-related work.

●

执行层
Execution

总部部门及所属企业
Headquarters, departments, and affiliated enterprises

负责在各自工作范围内开展全面的 ESG 实践。
Responsible for conducting concrete ESG activities within their respective scope of work.

ESG 目标管理

ESG goal management

温室气体排放 Greenhouse gas emissions	
目标 · Goals	2024 年达成情况 · Progress in 2024
持续减少温室气体排放。 To continuously reduce greenhouse gas emissions.	万元产值（收入）二氧化碳当量排放同比下降 3.21%。 The carbon dioxide equivalent emissions per CNY 10,000 of output value (income) reduced by 3.21% compared to the previous year.

废物排放 Waste discharge	
目标 · Goals	2024 年达成情况 · Progress in 2024
对工业制造类企业： 定期更换处理含挥发性有机物废气的净化装置内的废活性炭，定期委托有资质的第三方对废水、废气、噪声进行监测，污染物均达标排放，危险废物处置率达 100%。 Industrial and manufacturing enterprises: To regularly replace the waste activated carbon in the purification device/plant used for treating volatile organic compound waste gas. Regularly engage qualified third parties to monitor wastewater, waste gas, and noise levels. Ensure that all pollutants are discharged in compliance with applicable standards. Achieve 100% disposal of hazardous wastes.	对工业制造类企业： 杜绝了突发环境事件；废水、废气、噪声排放达标率 100%；危险废弃物处置率 100%。 Industrial and manufacturing enterprises: No environmental incidents occurred. The compliance rate of wastewater, waste gas, and noise discharge/emissions was 100%. The disposal rate of hazardous waste was 100%.
对工程类企业： 做到“六个百分百”，切实做到不扬尘、噪声不超标、垃圾污水达标排放，创建绿色文明施工工地。 Engineering/project contracting enterprises: To achieve the "six 100%" objective and ensure that no dust, noise, solid waste, or wastewater is produced, emitted, or discharged beyond applicable standards, thereby creating green and civilized construction sites.	对工程类企业： 全部工程类企业实现“六个百分百”。 Engineering/project contracting enterprises: All of them achieved the "six 100%" objective.

资源使用 Resources consumption	
目标 · Goals	2024 年达成情况 · Progress in 2024
<p>节能降耗：通过推进光伏项目建设、优化产品结构、节能改造、建设能源在线监测平台等方式减少主要电力消耗，进一步减少万元产值综合能耗。</p> <p>Energy conservation and consumption reduction: To decrease the main component of electricity consumption and further reduce the total energy consumption per CNY 10,000 of output value by promoting photovoltaic projects, optimizing product structures, implementing energy-saving renovations, and establishing online energy monitoring platforms.</p>	<p>节能降耗：万元产值（收入）能耗同比下降 5.08%。</p> <p>Energy conservation and consumption reduction: The energy consumption per CNY 10,000 of output value (income) decreased by 5.08% year-on year.</p>
<p>水资源管理：提高工程项目用水效率，逐步探索制定水资源消耗量化目标。</p> <p>Water resource management: To improve water use efficiency in engineering/construction projects and gradually explore the setting of quantitative targets for water resource consumption.</p>	<p>水资源管理：用水量同比下降 9.33%。</p> <p>Water resource management: Water consumption decreased by 9.33% year-on-year.</p>

科技创新 Scientific and technological innovation	
目标 · Goals	2024 年达成情况 · Progress in 2024
<p>到 2025 年，从事科技创新的研发人员占从业人员比例达到 25%。</p> <p>By 2025, 25% of employees will be engaged in scientific and technological innovation within R&D.</p>	<p>截至 2024 年底，从事科技创新的研发人员占从业人员比例达 26%。</p> <p>By the end of 2024, R&D personnel engaged in technological innovation accounted for 26% of the workforce.</p>

安全生产 Work safety	
目标 · Goals	2024 年达成情况 · Progress in 2024
<p>杜绝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。</p> <p>To eliminate work-related accidents, including those involving safety, special equipment, and fire, that are categorized as minor or above.</p>	<p>未发生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。</p> <p>No minor or major work safety accidents, special equipment incidents, or fire accidents occurred.</p>
<p>控制生产安全重伤率在 0.3‰ 以内、轻伤率在 2‰ 以内。</p> <p>Maintain the serious injury rate from work-related accidents at or below 0.3‰ and the minor injury rate at or below 2‰.</p>	<p>生产安全重轻伤事故得到有效控制。</p> <p>Both serious and minor work safety accidents have been effectively controlled.</p>

产品质量 Product quality	
目标 · Goals	2024 年达成情况 · Progress in 2024
<p>杜绝铁路交通一般 B 类及以上责任事故、工程质量一般及以上责任事故、重大质量问题。</p> <p>To eliminate minor (class B) rail accidents or higher, minor project quality accidents or higher, and major quality issues.</p>	<p>未发生铁路交通一般 C 类及以上责任事故、工程质量一般及以上责任事故、重大质量问题。</p> <p>No minor (class C) rail accidents or higher, no minor project quality accidents or higher, and no major quality issues occurred.</p>
<p>控制铁路交通一般 C 类责任事故、较大质量问题；铁路交通事故故障率及故障延时基本稳定。</p> <p>To control minor (Class C) rail accidents and above, as well as major quality issues. Ensure that the failure rate and delays related to rail accidents are basically stabilized.</p>	

产品质量 Product quality	
目标 · Goals	2024 年达成情况 · Progress in 2024
装备制造产品一次交验合格率达 96% 以上。 To ensure that the first pass yield (FPY) for manufactured equipment products exceeds 96%.	装备制造产品一次交验合格率达 97% 以上。 The first pass yield (FPY) for manufactured equipment products exceeded 97%.
各检验批、分项、分部工程施工质量检验合格率 100%。 To ensure that the pass rate for each batch, item, and sub-project during construction quality inspections is 100%.	各检验批、分项、分部工程施工质量检验合格率 100%。 The pass rate for all batches, items, and sub-projects during construction quality inspections was 100%.
单位工程一次交验合格率 100%。 To ensure a 100% one-time acceptance rate for unit projects.	单位工程一次交验合格率 100%。 The one-time acceptance rate for unit projects was 100%.
行业产品质量监督抽查合格率 100%。 To achieve a 100% pass rate for products during spot checks by the competent authority.	行业产品质量监督抽查合格率 100%。 The pass rate for products during spot checks by the competent authority was 100%.
新研发的安全关键产品、城轨信号系统集成项目 100%。 To ensure a 100% application rate of newly developed safety-critical products and a 100% integration rate for urban railway transit signal systems.	新研发的安全关键产品、城轨信号系统集成项目 100%。 The application rate of newly developed safety-critical products and the integration rate of urban railway transit signal systems were both 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。 To engage third parties to conduct safety assessments and independent safety testing for 100% of the software related to safety-critical products.	实现第三方安全评估，涉及安全关键产品的软件 100% 实现独立安全测试。 Third parties were engaged to conduct safety assessments, and independent safety testing was conducted on 100% of the software related to safety-critical products.

利益相关方沟通

Communication with stakeholders

中国通号积极主动与利益相关方开展沟通交流，认真倾听政府与监管机构、股东与投资者、客户、员工、供应商与合作伙伴、行业协会、社区及公众等利益相关方对于公司可持续发展的声音，通过日常沟通、线上回应、媒体报道以及发布报告等渠道，传播公司履责动态，回应利益相关方关切。

CRSC actively engaged and communicated with stakeholders. It carefully listened to the voices of government agencies, regulatory agencies, shareholders, investors, customers, employees, suppliers, partners, industry associations, communities, and the public regarding the company's sustainable development. It also disseminated its CSR fulfillment dynamics and addressed stakeholders' concerns through daily interactions, online responses, media outreach, and corporate reports.

利益相关方类型 Stakeholders	期望与诉求 Expectations and Appeals	沟通方式 Communication Channels
 政府与监管机构 Government and regulatory authorities	贯彻宏观政策 To implement macro policies 诚信守法经营 To operate honestly and legally 依法纳税 To pay taxes according to law 促进就业 To promote employment 带动地方经济发展 To drive local economic development	工作汇报 Work report 参加会议 Conferences 监督检查 Supervision and inspection 信息报送 Information reporting
 股东与投资者 Shareholders and Investors	良好的经营业绩 Good operation performance 资产保值增值 Asset preservation and appreciation 信息合规披露 To disclose information 降低经营风险 To reduce operation risks 股东权益保护 To protect the interests of shareholders and investors	企业定期报告及公告 Corporate annual report, middle term report and announcements 业绩发布会 Performance conference 股东大会 General meeting of shareholders 投资者见面会 Investors conference 沟通汇报 Reporting and communication
 客户 Clients	合同履行 To perform contracts 产品质量安全 To guarantee product quality and safety 提供优质服务 To offer premium service 保障客户隐私 To protect clients' information	客户拜访 Customer visit 客户满意度调查 Customer satisfaction survey 电话、邮件、信件及在线反馈 Telephone, e-mail, letter, and on-line feedback

利益相关方类型 Stakeholders	期望与诉求 Expectations and Appeals	沟通方式 Communication Channels
<div><div>员工 Staff</div></div>	<div>保障员工权益 To protect staff interests</div> <div>促进职业发展 To promote occupational development</div> <div>员工生活关怀 To offer staff caring</div> <div>保障薪酬福利 To offer rational salary and welfare</div> <div>加强海外员工管理 To enhance the management of overseas staff</div>	<div>职工代表大会 General meeting of staff representatives</div> <div>员工培训宣教 Staff training and education</div> <div>日常沟通 Daily communication</div>
<div><div>供应商与 合作伙伴 Suppliers and partners</div></div>	<div>诚信守法 Integrity and law-abiding</div> <div>阳光采购 To guarantee open, fair and legal procurement</div> <div>合作共赢 To achieve win-win cooperation</div> <div>信息保密 To keep information confidential</div>	<div>公开招标 Open tendering</div> <div>开展合作 Carrying out cooperation</div> <div>行业沟通与交流 Industrial communication and exchanges</div> <div>高层互访 High-level visit exchanges</div>
<div><div>行业协会 Industry associations</div></div>	<div>公平竞争 Fair competition</div> <div>科技创新研发 Technology innovation research</div> <div>助力行业进步 To promote the industrial development</div>	<div>加强同业交流 Enhancing communication with peers</div> <div>参加行业论坛 Participating in industry forums</div> <div>考察互访 Research tours and exchange visits</div>
<div><div>社区及公众 Community</div></div>	<div>参与社区建设 To take part in community construction</div> <div>社会公益服务 To conduct public welfare activities</div>	<div>社区沟通宣传 Community communication and publicity</div> <div>开展公益活动 Organizing public welfare activities</div>

实质性议题管理

Material issues management

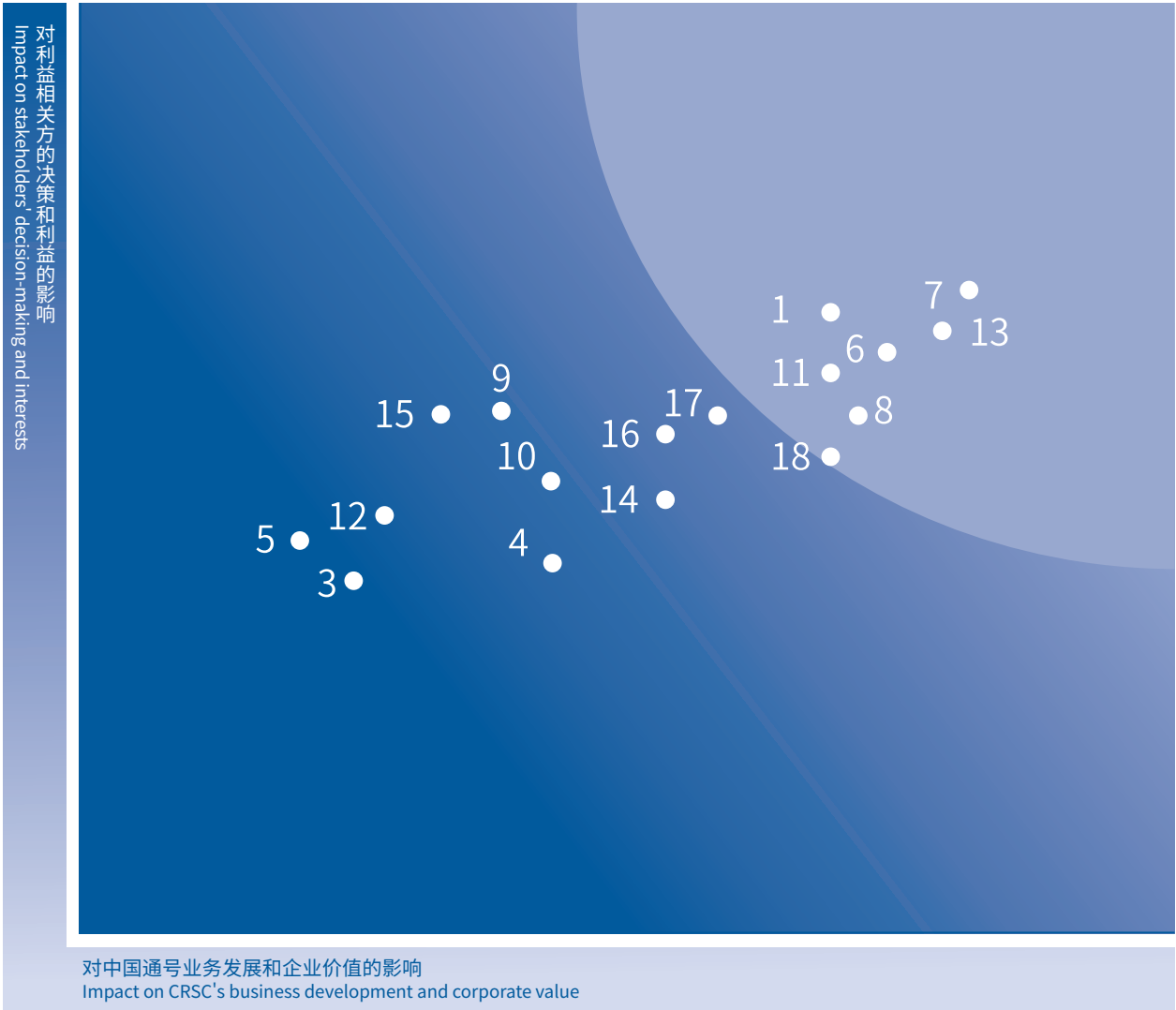
中国通号密切关注国际和国内 ESG 政策趋势与最新标准，结合交易所要求，对标优秀企业和资本市场评级关注，结合公司发展战略、利益相关方关注议题、ESG 领域专家建议，确定 ESG 议题库。从对中国通号业务发展和企业价值的影响、对利益相关方的决策和利益的影响两个维度，对识别结果进行重要性排序，并在年度 ESG 报告中对实质性议题进行披露。

CRSC closely monitored both international and domestic ESG policy trends, as well as the latest standards. It established its ESG issues library by considering the requirements of stock exchanges, benchmarking outstanding enterprises, capital market concerns regarding ratings, the company's development strategy, stakeholders' concerns, and expert advice in the ESG field. CRSC ranked the importance of the identification results based on two dimensions: their impact on the company's business development and corporate value and their influence on stakeholders' decision-making and interests. It also disclosed substantive issues in the annual ESG report.



中国通号 2025 年实质性议题矩阵

CRSC's Matrix of Material Issues 2025



很重要 Very important			
议题 Issues	对应序号 SN	议题 Issues	对应序号 SN
产品质量与安全性 Product quality and safety	7	智能化与数字化转型 Intelligent and digital transformation	8
法规遵循与合规管理 Regulatory compliance and compliance management	13	ESG 相关治理 ESG management	18
创新驱动与技术研发 Innovation-driven and technology R&D	6	碳排放与能效管理 Carbon emissions and energy efficiency management	1
职业健康与安全 Occupational health and safety	11		

一般重要 Important			
议题 Issues	对应序号 SN	议题 Issues	对应序号 SN
环境保护与资源利用效率 Environmental protection and resource utilization efficiency	2	社会责任投资与公益活动 CSR investment and public benefit activities	12
应对气候变化 Addressing climate change	3	反腐败与廉洁经营 Anti-corruption and clean management	14
清洁技术研发 Clean technology R&D	4	公平竞争 Fair competition	15
员工权益保障与职业发展 Employee rights protection and career development	5	客户隐私保护与数据安全 Customer privacy protection and data security	16
知识产权保护 Intellectual property protection	9	社会经济发展贡献 Contribution to social and economic development	17
供应链管理 with 责任采购 Supply chain management and responsible procurement	10		

回应的 SDGs
SDGs

16 和平、正义与
强大机构



稳健经营 深化价值创造

Deepening Value Creation
through Stable Operation

规范公司治理

Standardizing Corporate Governance

落实风险防控

Implementing Risk Prevention and Control

党建引领发展

Guiding Development with Party Building

恪守商业道德

Abiding by Business Ethics

信息安全与隐私保护

Information Security and Privacy Protection



规范公司治理 Standardizing Corporate Governance

中国通号严格遵循公司治理法律法规，秉持严谨且透明的原则，构建了完善且权责明晰的治理架构。通过严格的内部管理制度与道德准则确保合规运营，通过高效监督机制严防风险。高质量开展信息披露，与各方保持良好沟通，有力推动企业可持续发展。

CRSC strictly adheres to all applicable corporate governance laws and regulations, upholding the principles of strictness and transparency to establish a well-structured governance framework with clear rights and responsibilities. The company ensures compliance through strict internal management systems and a code of ethics while mitigating risks through efficient supervision mechanisms. Additionally, it maintains high standards of information disclosure, fosters effective communication with all stakeholders, and actively promotes the sustainable development of enterprises.

董事会建设 Formation of the Board of Directors

公司董事会共下设5个董事委员会，分别为战略与投资委员会、审计与风险管理委员会、提名委员会、薪酬与考核委员会、质量安全委员会。公司每年按上市规则及公司章程轮流退任及重选董事。董事会成员具备丰富的行业经验与专业知识，确保战略决策的科学性与前瞻性。

The Company's Board of Directors consists of five committees: the Strategy and Investment Committee, the Audit and Risk Management Committee, the Nomination Committee, the Remuneration and Assessment Committee, and the Quality and Safety Committee. The company retires and re-elects directors annually in accordance with the listing rules and Articles of Association. The Board members possess extensive industry experience and professional expertise, ensuring that strategic decisions are both scientific and forward-looking.

董事会独立性 Independence of the Board of Directors

公司董事会共有6名董事，分别由2名执行董事、1名非执行董事、3名独立非执行董事组成。为确保独立非执行董事有效发挥作用，公司修订《独立非执行董事工作制度》。制定严格任职资格标准，审查其商业利益与过往经历，设置合理薪酬，避免与业绩挂钩，明确职责权限，建立独立董事提名选举机制，定期进行独立性评估，加强培训教育，从而保障其公正客观履职，维护公司治理与股东利益。独立董事每年与年报共同发布《独立董事履职情况报告》，充分披露独立董事年度工作绩效。

CRSC's Board of Directors consists of 6 directors, including 2 executive directors, 1 non-executive director and 3 independent non-executive directors. To enhance the effectiveness of independent non-executive directors, the company has revised

共下设董事委员会

5↑

CRSC's Board of Directors consists of 5 committees

董事会有效性 Effectiveness of the Board of Directors

its Working System for Independent Non-Executive Directors. The company has implemented stringent job qualification standards, reviewing candidates' business interests and past experiences; set reasonable salary standards unrelated to business performance; clarified responsibilities and authorities; established an independent director nomination and election mechanism; conducted regular assessment on independence; and strengthened training and education. These measures ensure that independent directors perform their duties fairly and objectively, ultimately strengthening corporate governance and protecting shareholder interests. Independent directors release the Report on Performance of Functions by Independent Directors alongside the company's annual report, ensuring full disclosure of their annual work performance.

持续优化公司治理机制，印发《关于进一步加强和改进中国通号董事会建设的若干举措》，落实国务院国资委中央企业董事会建设工作推进会要求，加快建设科学、理性、高效的董事会。报告期内，公司董事会召开会议8次，决策议案39项。有关会议情况均以公告形式刊载于交易所及公司网站。

CRSC continued to optimize its corporate governance mechanism, issued the Several Measures on Further Strengthening and Improving the Building of CRSC's Board of Directors, implemented the requirements of the work promotion meeting on the building of the boards of directors of Central SOEs held by the State-owned Assets Supervision and Administration Commission of the State Council (SASAC), and accelerated the establishment of a scientific, rational and efficient Board of Directors. During the reporting period, the Company's Board of Directors held 8 meetings, resulting in 39 resolutions and proposals. These meetings were disclosed through announcements on the websites of exchanges and the company.

深化董事会成员能力建设。组织外部董事围绕“一升、一进、一退”三大任务开展实地调研，形成《关于中国通号聚焦轨道交通和低空经济“双赛道”有关情况的报告和建议》；结合新“国九条”、《中华人民共和国公司法》、独立董事制度改革等要求，组织全体董事参加交易所、上市公司协会、公司组织的各类履职培训，学习“A+H”证券市场相关的监管政策、法规，特别关注上市公司董事在信息披露、内幕信息管理、合规交易等方面的责任。

CRSC enhanced the capacity building of its board members, organized outside directors to conduct on-site research around the three major tasks of "one upgrade, one entrance, and one exit." This initiative led to the development of the Report and Recommendations on CRSC's "Dual Tracks" Initiative for Developing Rail Transit and Low-Altitude Economy Business. Additionally, CRSC facilitated the participation of all directors in various performance training programs offered by the exchanges, listed company associations and corporate organizations. These programs covered regulatory policies and regulations related to the "A+H" stock markets, with special attention to the directors' responsibilities of listed companies in information disclosure, insider information management and compliant trading. This initiative was conducted in accordance with the requirements of the new "Nine New Guidelines" (Several Opinions of the State Council on Strengthening Supervision, Preventing Risks, and Promoting High Quality Development of the Capital Market), the Company Law of the People's Republic of China, and the requirements for reforming the independent director system.

董事会召开会议

8次

The Company's Board of Directors held 8 meetings

决策议案

39项

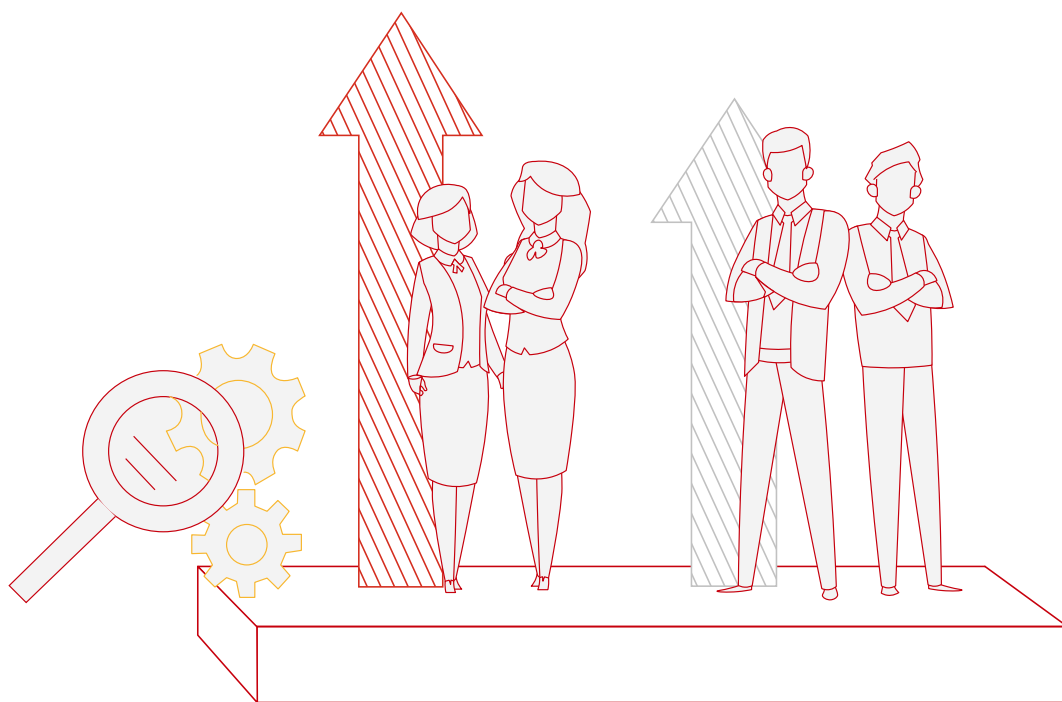
Resulting in 39 resolutions and proposals

董事会多元化

Diversity of the Board of Directors

公司坚持用人唯才的理念，持续完善董事会架构，以确保董事会能够高效运作，切实履行职责，有力推动公司的稳健发展。为进一步促进董事会性别平衡，公司于2025年3月14日推动完成女性董事的委任工作。

CRSC adheres to the concept of capability-based employment and continuously enhances the structure of the Board of Directors, to ensure the efficient operation of the Board of Directors and effective fulfillment of their responsibilities. This approach also supports the Company's steady and robust development. To further promote gender balance within the Board of Directors, the company has appointed one female director on March 14, 2025.



投资者沟通

Communication with investors

公司建立健全沟通机制，主动、全面地披露公司信息，让股东充分了解公司运营状况。促进多层次投资者关系良性互动，常态化召开高质量业绩说明会，开展投资者交流会 100 余场，为不同类型的投资者提供了充分的沟通平台。报告期内，公司在上海证券交易所沪市科创板上市公司 2023—2024 年度信息披露工作评价中获最高评级“A”级评价。

CRSC established an effective communication mechanism, to proactively and fully disclose the company's information to shareholders. It has fostered positive interactions among investors at all levels, regularly held high-quality performance briefing meetings, and organized over 100 meetings to exchange views with investors. These efforts have provided a comprehensive platform for different types of investors to effectively communicate with the company. During the reporting period, the company received the highest rating of "A" in the evaluation of information disclosure work for companies listed on the STAR Market of the Shanghai Stock Exchange for the years 2023-2024.

守法合规经营

Compliant operation

公司坚持“合规从高层做起、全员主动合规、合规创造价值”的合规理念，采取顶层引领、培训宣贯、签署承诺的方式，着力构建高层人员引领合规、全体员工践行合规的价值体系。报告期内，公司结合国务院国资委要求，发布《中国通号建设世界一流法治企业实施方案》，强化“五位一体”工作机制，为进一步深化法治合规工作提供了行动指南。

CRSC adheres to the compliance management concept of "top management leading by example and all employees proactively complying to create value on the premises of compliance." The company implements a top-down approach through promotion, training & education, and letters of commitment to focus on building a value system where top management leads compliance and all employees practice compliance. During the reporting period, the company released the Scheme for Building CRSC into a World-Class Law-Based Enterprise in accordance with the SASAC's requirements. This initiative reinforces the "Five in One" work mechanism and provides actionable guidelines for further enhancing law-based compliance management work.

夯实合规管理组织体系

Creating a robust organizational structure for compliance management

公司党委、董事会、经理层、首席合规官、合规管理牵头部门及各业务部门分工协作，共同参与合规管理工作。设立公司首席合规官，由总法律顾问兼任，深度参与重大合同、重要决策的审核把关，牵头组织合规管理制度建设、合规体系有效性运行评估等各项工作。

CRSC's Party Committee, Board of Directors, management, Chief Compliance Officer, compliance management leading department and various business departments collaborate to promote the compliance management work. The company has appointed its General Legal Advisor to concurrently serve as the Chief Compliance Officer, who is deeply involved in the review and control of major contracts and important decisions. Additionally, they lead the development of the compliance management system and assess the effectiveness of its operation, among other duties and functions.

2024 年，公司发布《关于建立健全业务合规官和兼职合规管理员工作机制的通知》，明确各企业业务合规官、兼职合规管理员的设置、职责和发挥作用的重点环节，督促各业务和职能部门切实承担起本业务领域合规管理的主体责任。总部及各所属企业分别发布业务合规官、兼职合规管理员名录，合规管理体系不断纵向延伸和穿透。

In 2024, the company released a Notice on Establishing and Improving the Working Mechanism of Business Compliance Officers and Part-Time Compliance Administrators. The notice aimed to clarify the configuration, duties and key functional aspects of each enterprise's business compliance officer and part-time compliance administrator. It also urged all business and functional departments to effectively fulfill their compliance management responsibilities within their respective business areas. The headquarters and Subsidiaries had released their own lists of business compliance officers and part-time compliance administrators, further expanding the compliance management system vertically to cover each unit of the company.

完善合规管理制度规范

Improving internal compliance management rules and regulations

将合规理念融入企业制度并内化为刚性约束，通过合规管理手册、合规行为准则、专项合规指引等，引导全员积极参与合规宣传活动，主动遵守合规管理要求，坚定捍卫合规经营底线，推动合规创造价值。

CRSC has integrated the concept of compliance into its internal rules and regulations as a strict requirement. This ensures that all employees actively participate in compliance education activities, adhere to compliance management standards, uphold the fundamental principles of compliance management, and foster value creation through compliance. These efforts are reinforced through compliance management manuals, codes of compliant conduct, special compliance guidelines, etc.

2024 年，在由 4 个层次、18 项制度构成的合规管理制度体系的基础上，结合企业管理运行需要，从总部管控权责界面、境外经营合规等方面不断丰富合规管理制度、手册和工作指南。

In 2024, CRSC continuously refined its internal compliance management rules, regulations, manuals and work guidelines. Building upon the existing compliance management system—comprising 18 sets of internal rules and regulations across four levels—these enhancements focused on defining control rights and responsibilities at headquarters, addressing overseas business compliance requirements, and aligning with the needs of enterprise management and operation.

开展合规考核评价

Carrying out compliance assessment

发布《中国通号所属子企业法治合规绩效考核实施细则》，组织开展 2023 年度法治合规管理绩效考核，发布《关于对各企业 2023 年法治合规管理考核情况的通报》，督导各企业互相借鉴，共同提升全系统法治合规工作水平。

The company released the Rules for Implementing Compliance Management Performance Assessment in CRSC Subsidiaries, organized the 2023 Compliance Management Performance Assessment, and issued the Circular on the 2023 Compliance Management Assessment of Subsidiaries. This initiative aimed to encourage all Subsidiaries to learn from each other, and jointly improve the company's overall compliance management abilities and capabilities.

2024 年，针对 5 家二级企业、2 家三级企业开展现场合规评价，出具意见反馈函，揭示合规风险和合规问题，合规评价连续两年实现全覆盖。针对合规评价工作中发现的问题和不足，相关企业完善制度、建立机制，通过立行立改和持续整改等方式，不断增强合规管理有效性。

In 2024, CRSC conducted on-site compliance management assessments at 5 secondary-tier subsidiaries and 2 third-tier subsidiaries, and issued the corresponding opinion letters, to identify the compliance risks and issues, thereby achieving full coverage of compliance management assessments for two years. In response to the problems and deficiencies identified during the compliance management assessments, relevant subsidiaries have improved their internal rules and regulations, established implementation mechanisms, and further enhanced the effectiveness of compliance management through immediate responses and on-going improvements.

开展守法合规培训

Offering compliance training

将守法合规培训作为培育合规文化的重要举措。组织全系统开展以“大力弘扬宪法精神，推动进一步全面深化改革”为主题的宪法宣传周活动，充分运用“网、微、屏”等媒体平台，弘扬宪法精神与法治文化；组织各企业法务人员参加国务院国资委风险合规专题网络培训、境外工程项目核心法律风险防范、反腐败及世行制裁合规风险防范等专题培训。

CRSC regards compliance training as a key initiative in fostering a compliance-oriented culture. The company organized a "Constitution Week" event across the Group with the theme "Vigorously promoting the spirit of the Constitution and further promoting all-round and in-depth reforms." It leveraged various media platforms, such as websites, blogs and display screens, to promote the spirit of the Constitution and the culture of the rule of law. Additionally, legal personnel from subsidiaries were encouraged to participate in specialized online training sessions on risk and compliance offered by SASAC, as well as the special training sessions on prevention against key legal risks in overseas projects, anti-corruption, and prevention against compliance risks from World Bank sanctions.

指标 Indicator	单位 Unit	2022	2023	2024
法律审核率（企业规章制度、经济合同、重大决策的法律审核） Legality review rate (review of the legality of internal rules & regulations, economic contracts and major decisions of enterprises)	%	100	100	100
经济合同履约率 Economic contract performance rate	%	100	100	100
守法合规培训场次 Number of compliance training sessions	场 Times	87	106	116
守法合规培训人次 Aggregate number of participants of compliance training sessions	人次 Person	9,152	8,164	8,852



落实风险防控 Implementing Risk Prevention and Control

中国通号建立健全全面风险管理体系，持续优化风险管理及内部控制体系，通过完善风险识别、评估、监测与应对机制，有效防范各项风险，促进企业长期可持续发展。

CRSC has established and continues to enhance a comprehensive risk management system, consistently optimizing risk management and internal control systems. The company effectively mitigates various risks by improving risk identification, assessment, monitoring and response mechanisms, ensuring the long-term sustainable development of its enterprises.

加强内控建设 Strengthening the development of internal control mechanisms

公司持续加强内控建设，不断完善内控体系，确保经营管理的合规性和有效性。报告期内，公司总结全系统 2023 年内控体系建设情况，编制上报《中国通号 2023 年度内控体系工作报告》，发布《关于做好 2024 年内控体系建设及规章制度建设有关事项的通知》，就内控体系建设年度重点工作提出 11 个方面的要求，组织各企业、各部门按照新的业务定位和职能划分，制定发布年度制度建设计划，并督促实施推进。进一步规范内控监督评价，重点关注企业重点领域、重要业务及关键环节，深入排查经营管理中存在的内控缺陷，持续跟踪问题整改，促进内控体系不断优化。

CRSC continues to strengthen the development of its internal control mechanisms, continuously improving its internal control system to ensure compliance and operational efficacy in business management. During the reporting period, CRSC reviewed the internal control system development across the Group in 2023, prepared and submitted the CRSC 2023 Internal Control System Work Report. Additionally, it issued the Notice on Matters Concerning Doing a Good Job during the Construction of Internal Control System and the Establishment of Relevant Internal Rules & Regulations in 2024, which outlines 11 requirements for the annual key tasks for developing the internal control system. The company organized and supervised all subsidiaries and departments to formulate and publish annual plans for establishing the internal rules and regulations according to the new business positioning and functional division. It also strengthened internal control supervision and evaluation, focusing on key areas, important businesses and critical processes of enterprises. Through in-depth assessments of internal control deficiencies in business management, continuous tracking of corrective actions and systematic improvements, CRSC promotes the ongoing optimization of its internal control system.

报告期内，在国务院国资委对 2022 年各中央企业内部审计工作质量的评估中，中国通号荣获 A 级评价，在 2023—2025 年中央企业深化改革中期评估中，中国通号内部审计工作荣获排名第一。

During the reporting period, CRSC was rated "A" by SASAC in its 2022 evaluation of internal audit work among Central SOEs. Additionally, in the 2023-2025 mid-term assessment of central SOE deepening reforms, CRSC's internal audit work was ranked first place.

内控体系

CRSC's Internal Control System

法律合规部 Legal & Compliance Department

负责统筹规划全系统法治、合规、风险、内部控制、制度建设实施目标并组织落实，协调、推动、督促全系统内控体系建设，指导本级及所属企业开展内控制度“立改废”工作。

Responsible for planning and implementing the overall goals of building the compliance management, risk management and internal control frameworks, along with relevant rules and regulations across the Group. It also coordinates, promotes, and oversees the development of the internal control system throughout the Group, while guiding the headquarters and all subsidiaries to carry out the work of "establishing, changing and abolishing" internal control rules and regulations.

审计部 Audit Department

负责对内控有效性进行评估，制定监督评价相关制度，开展监督与内控审计工作。制定《2023 年—2025 年内控监督规划》，按照管理级次，分级分层开展对子公司内控体系有效性的监督检查。

Responsible for evaluating the effectiveness of internal control, developing relevant rules and regulations for supervision and evaluation, and conducting supervision and internal control audits. It developed the 2023-2025 Internal Control Supervision Plan and carried out hierarchical and tiered supervision and inspections of subsidiaries' internal control systems based on management levels.

职能部门及各子公司 Functional departments and subsidiaries

内控管理的执行机构负责各自业务职责范围内相关业务的风险与内控管理工作，并接受公司法律合规部和审计部的组织、协调、指导、评价和监督，共同形成全面覆盖各级次企业、各业务领域的，上下协调、有序互动、流程清晰、对接顺畅的内控管理有机体系。

They constitute the executing body of internal control management, and are responsible for the risk and internal control management of relevant businesses within their respective business scopes. They operate under the organization, coordination, guidance, evaluation and supervision of the Company's Legal & Compliance Department and Audit Department. Together, they establish a comprehensive internal control management system that spans all levels of subsidiaries and business areas, ensuring seamless vertical and horizontal coordination, structured interaction and clear processes.

指标 Indicator	单位 Unit	2022	2023	2024
开展审计 Audits carried out	次 Times	123	106	108
其中，专项审计 Including special audits	次 Times	60	62	64

全面风险防控 Comprehensive risk prevention and control

公司遵循风险分级管理、分类管理和集中管理的原则，建立符合自身特点的全面风险管理组织体系，主要包括公司党委、董事会、审计与风险管理委员会、经营层、风险与内控管理部门、内部审计部门、其他各职能部门、各子公司，各主体依照公司章程以及制度规定履行风险防控职责。

CRSC adheres to the principles of centralized risk management based on grading and classification, and has established an organizational structure for applying comprehensive risk management aligned with its unique characteristics. This organizational structure primarily includes the Company's Party Committee, Board of Directors, Audit and Risk Management Committee, management team, risk and internal control management departments, internal audit departments, other functional departments and subsidiaries. Each entity fulfills its risk prevention and control responsibilities in accordance with the company's Articles of Association and other internal rules and regulations.



风险预测 Risk prediction

组织全系统开展 2024 年度重大风险预测评估，开展年度风险信息收集、量化评价，制定风险管理策略及应对措施，编制《中国通号 2024 年度重大经营风险预测评估报告》。

CRSC organized a comprehensive risk prediction and assessment of major risks for 2024 across the entire Group, gathering and quantifying annual risk data, formulating risk management strategies and response measures, and compiling the CRSC 2024 Major Business Risk Prediction and Evaluation Report.

风险监测 Risk monitoring

针对各子企业重大经营风险防控重点，建立“一企一表”的差异化风险量化监测指标体系，组织全系统开展季度监测。按季度收集、分析公司外部宏观环境因素、行业因素变化情况及各子企业风险管控措施和风险监测指标运行情况，编制季度重大风险监测报告，向董事会审计与风险管理委员会汇报。

CRSC has established a differentiated risk quantification monitoring index system, following the "one table for one enterprise" approach, to enhance the prevention and control of major business risks in its subsidiaries. The company conducts quarterly monitoring across the entire group, collecting and analyzing external macro environmental factors, changes in industry factors, risk control measures and risk monitoring indexes of each subsidiary on a quarterly basis. It also prepares and submits quarterly major risk monitoring reports to the Audit and Risk Management Committee under the Board of Directors.

化解工程项目 存量风险 Mitigating residual risks in existing projects

制定《关于进一步聚焦主责主业严控经营风险加快推动市政房建业务转型的意见》《存量工程项目处置的指导意见》《关于落实股份公司 2024 年度“控制不发生重大经营风险”攻坚任务的工作方案》，有序化解工程项目存量风险。建立风险处置台账，对重点子企业开展现场检查，督导工程项目推进风险化解进度。

CRSC has formulated the Opinions on Paying More Attention on Main Responsibilities and Core Businesses to Strictly Control Business Risks and Accelerate Transformation of House Building and Municipal Project Businesses, the Guidelines on the Disposal of Existing Projects, and the Work Plan for Implementing CRSC's 2024 Critical Task of Controlling Major Business Risks to systematically mitigate and eliminate the risks in existing projects. Additionally, CRSC has established a risk management ledger, conducted on-site inspections of key subsidiaries, and supervised the progress of risk mitigation in existing projects.

境外风险管控 Overseas risk control

加强境外项目经营风险管控，组织相关子企业全面排查境外业务法律合规风险，完善境外经营投资、境外工程承揽的合规管控制度。

CRSC has strengthened the management of operational risks in overseas projects by organizing relevant subsidiaries to conduct a comprehensive assessment of compliance risks in international business activities. Additionally, the company has enhanced its compliance control system for facilitating overseas business investment and overseas project contracting.

重大风险评估 监测

Assessment and
monitor on major
risks

开展年度重大风险预测评估和季度风险跟踪监测，主动前移风险防控关口，指导相关子企业落实风险防控措施，确保风险早识别、早干预、早处置。

CRSC conducts annual major risk forecasting and assessment, along with quarterly risk tracking and monitoring, proactively shifting the focus of risk prevention and control forward. It guides relevant subsidiaries in implementing risk control measures to ensure early identification, intervention, and resolution of risks.

战新领域风险 研究

Research on risks in
strategic emerging
industries

加强对战新业务领域法律合规风险的分析研究，聚焦合作模式选择、股权结构设置等重点环节提供法律解决方案和风险防范，维护国有资产安全 and 公司合法权益。

CRSC has enhanced its analysis and research on compliance risks in strategic emerging industries, focusing on critical areas, such as cooperation mode selection and equity structure setting. It provides legal solutions and risk prevention strategies to safeguard state-owned assets and protect the company's legitimate rights and interests.



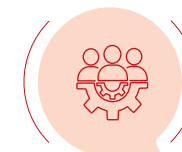
党建引领发展 Guiding Development through Party Building

中国通号深入学习贯彻习近平新时代中国特色社会主义思想 and 党的二十届三中全会精神，以党的政治建设为统领，聚焦党建赋能高质量发展，积极探索构建“1+2+3+N”工作体系，有力推动党建与生产经营深度融合、同频共振，助推企业高质量发展。

CRSC thoroughly studied and implemented Xi Jinping Thought on Socialism with Chinese Characteristics for a New Era and the spirit of the Third Plenary Session of the 20th Central Committee of the Communist Party of China (CPC). Guided by the CPC's political development requirements, CRSC emphasized strengthening high-quality development through Party building. It actively explored the development of a "1+2+3+N" Work System, and effectively promoted the deep integration and resonance between Party building and business operation, to drive the high-quality development of its enterprises.

通号档案：

CRSC's file:



“1+2+3+N”工作体系
"1+2+3+N" Work System

围绕“融入中心抓党建，抓好党建促发展”的理念，实现组织有效覆盖、工作有效覆盖，聚焦顶部、中部和底部，构建“N”个党建品牌。

It aims to achieve effective organization and work coverage. Guided by the concept of "focusing on Party building with total involvement, and promoting development through Party building", it adopts a multi-level approach—high, middle and low levels, to establish "N" Party building brands.



全面推进学习教育
Comprehensively promoting learning and education

印发《集团公司党委学习宣传贯彻党的二十届三中全会精神方案》，明确 18 项具体措施，深入学习贯彻全会精神，组织分层分级培训，做到全体党员集中轮训全覆盖。

CRSC issued the Scheme for the Party Committee of the Group Company to Study, Promote and Implement the Spirit of the Third Plenary Session of the 20th Central Committee of the Communist Party of China, outlining 18 specific measures for in-depth learning and implementation of the spirit of the Plenary Session. The company also organized training sessions across all subsidiaries, ensuring comprehensive coverage of all Party members through rotational centralized training.

印发《集团公司党委巩固拓展学习贯彻习近平新时代中国特色社会主义思想主题教育成果的实施方案》，细化 6 方面 21 项具体任务，建立健全“以学铸魂、以学增智、以学正风、以学促干”长效机制。

CRSC issued the Plan for the Party Committee of the Group Company to Consolidate and Extend the Achievements of Themed Education on Xi Jinping Thought on Socialism with Chinese Characteristics for a New Era, detailing 21 specific tasks across six key areas. The plan aims to establish and continuously improve a long-acting mechanism of "forging the soul, enhancing the knowledge, correcting misconducts and promoting practice through learning".

全力保障党纪学习教育取得实效，全系统组织开展中心组学习 227 次，邀请专家解读培训 103 场，书记讲纪律党课 451 场，开展“三会一课”、主题党日 4,479 次，开展警示教育 167 场次，全力保障党纪学习教育取得实效。

CRSC made every effort to enhance the effectiveness and efficiency of Party discipline learning and education; organized 227 central group learning sessions across the Group; invited experts to provide 103 training and interpretation sessions; organized 451 disciplinary lectures by secretaries of the party committees; organized 4,479 "Three Meetings and One Lecture" and "Themed Party Day" activities; and carried out 167 warning education activities. These initiatives ensured the thorough and impactful implementation of Party discipline learning and education.

持续筑牢基层堡垒 Continuously building strong grassroots fortresses

落实“四对接、四同步”，全面推动实现“两个全覆盖”。推动基层党组织规范化建设，持续深化基层党建“七抓”工程。

CRSC implemented the "Four-Interconnection and Four-Synchronization", promoted the realization of "Two-Full-Coverage" (to cover both the organization and work of the Party). The company also promoted the standardized development of grassroots Party organizations and continuously deepened the "Seven Focuses" grassroots Party building program.

开展建强党建链赋能产业链创新链主题实践活动，编发《中国通号产业链创新链党建赋能专项行动“1+N”工作指引》，开展专题研讨培训，推动产业链创新链党建融合发展，8 个理论实践成果入选中央企业党建创新案例。

CRSC launched a themed practice activity to strengthen the Party building for empowering the innovation chain and industry chain; formulated and issued the CRSC "1+N" Work Guidelines for the Special Action to Empower the Industry Chain and Innovation Chain with Party Building; organized special seminars and training sessions, to promote the integrated development of Party building in the innovation chain and industry chain. As a result, 8 theoretical and practical achievements were recognized as innovative cases of Party building in Central SOEs.

指导各企业高质量落实国资委全年 248 名党员发展目标。

CRSC guided all subsidiaries to well implement the annual goal to admit 248 new party members set by the SASAC.



提升干部队伍素质

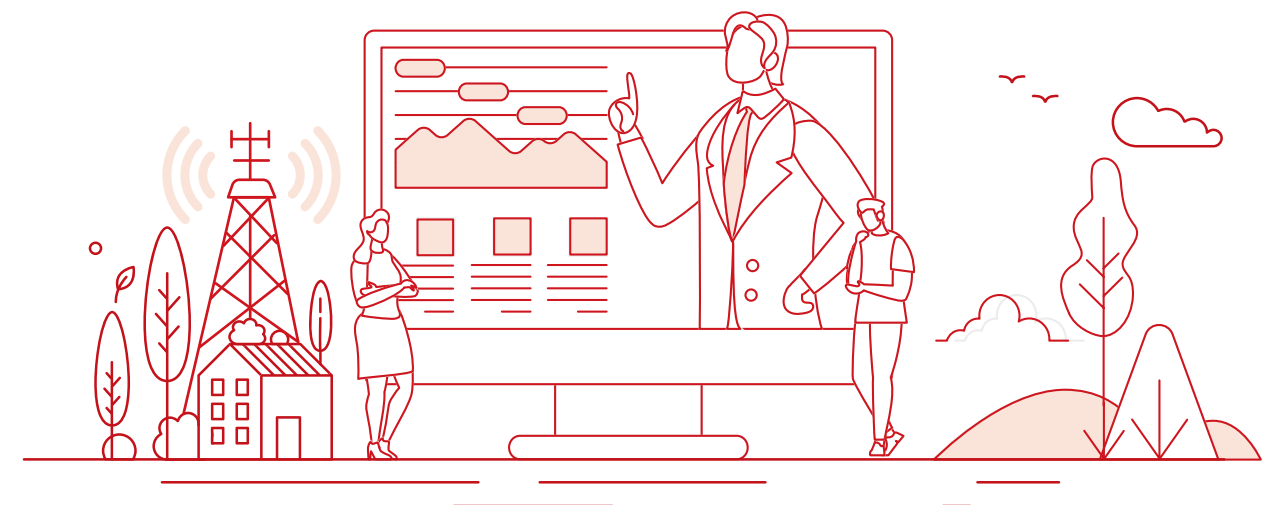
Enhancing the competence of cadre team

用活“双培养”机制，通过专题辅导、情景模拟、实践教育、经验交流等方式，开展党务干部、支部书记、支委班子定期轮训和集中培训，有效解决基层党务人员“不适应、不会干”的问题。

CRSC leveraged the "two-way key personnel cultivation mechanism" (to cultivate key personnel into Party members, and cultivate Party members into key personnel) to carry out regular rotation-based and centralized training for Party cadres, Party branch secretaries, and Party branch committee members through topic-based tutoring, scenario simulation, practical education and experience sharing, and effectively solve the "inadaptable and incapable" problems of grassroots Party members.

在实践中培养和发现优秀干部，组织推荐和选拔交流挂职干部、主题教育工作人员、巡视工作人员，遴选政治素质高、业务素质好的精兵强将，充实到各专项工作中，为相关工作开展提供人力支撑。

CRSC cultivated and discovered outstanding cadres through practical experience. The company organized the recommendation and selection of rotated and temporary cadres, topic-based education staff and inspection personnel. Additionally, CRSC assigned elites with high political consciousness and professional capabilities to lead or participate in special tasks, ensuring strong human resource support for the effective execution of key initiatives.



恪守商业道德 Abiding by Business Ethics

中国通号严格遵守《中华人民共和国反洗钱法》《中华人民共和国反不正当竞争法》《关于禁止商业贿赂行为的暂行规定》等法律法规和业务所在地适用的防止贿赂、勒索、欺诈及反洗钱的相关法律法规，反对一切形式的贪污腐败行为和不正当竞争。报告期内，公司未发生不正当竞争事件和商业贿赂及贪污事件。

CRSC strictly complies with the Anti-Money Laundering Law of the People's Republic of China, the Anti-Unfair Competition Law of the People's Republic of China, the Interim Provisions on the Prohibition of Commercial Bribery, and other laws and regulations against bribery, extortion, fraud and money laundering applicable in the jurisdictions where the business is conducted. The company firmly opposes all forms of corruption and unfair competition. During the reporting period, the company reported did not experience any incidents of unfair competition, commercial bribery or corruption.

制度建设

Establishing internal rules and regulations

树立廉洁从业的良好风气，制定并持续完善《对领导干部进行提醒、函询和诫勉的实施细则》《职工违纪违规处理规定》《关于查办腐败案件向集团公司纪委报告的实施办法（试行）》《纪委监督检查执纪审查安全工作暂行规定》《关于实行廉政谈话制度的规定》《受处分人员回访教育实施暂行办法》《纪委运用监督执纪“四种形态”实施办法》《领导干部容错纠错实施办法（试行）》《监督执纪工作暂行办法》等制度规定，筑牢稳健发展的道德底线。

CRSC promotes a culture of integrity and ethical business practices by formulating and continuously improving relevant internal rules and regulations, including the Rules for Reminding, Inquiring and Admonishing Leading Cadres, the Regulations on Punishments against Employee Violations, the Measures for Reporting Corruption Cases to the Discipline Inspection Commission of the Group Company (Trial), the Interim Provisions on the Legitimacy of Supervision, Inspection and Discipline Enforcement by the Discipline Inspection Commission, the Provisions on Implementing Integrity Related Interviews, the Interim Measures for the Follow-up Education of Punished Personnel, the Measures for the Discipline Inspection Commission to Apply the Four Forms of Supervision and Discipline Enforcement, the Measures for Tolerating and Correcting Misconducts of Leading Cadres (Trial), and the Interim Measures for Executing Supervision and Discipline Enforcement Work. These institutional regulations serve as a moral foundation for stable and sustainable development.

党风廉政建设

Improving Party conduct and upholding integrity

制定修订《党委、纪委落实全面从严治党“两个责任”会商实施办法》《党委落实全面从严治党主体责任清单》等一系列制度，条目式清单化梳理形成《全面从严治党会议清单》《党风廉政建设和反腐败工作主体责任重点事项及清单》，推动各级党委、党员领导干部知责、担责、履责，形成层层抓落实的工作格局，开创管党治党新局面。

CRSC has formulated and revised a series of internal rules and regulations, including the Measures for Carrying out the Consultation on the "Two Responsibilities" of

the Party Committee and Discipline Inspection Commission in Implementing the Requirements for Full and Strict Governance over the Party and the List of Main Responsibilities of the Party Committee in Implementing the Requirements for Full and Strict Governance over the Party. Additionally, tasks and responsibilities have been systematically organized into the List of Meetings for Implementing the Requirements for Full and Strict Governance over the Party and the List of Key Issues and Main Responsibilities for Improving Party Conduct, Upholding Integrity and Combating Corruption. These efforts aim to strengthen awareness, accountability and fulfillment of Party committees and Party leaders at all levels, establish an effective implementation framework across all levels, and set a new standard for Party management and governance.

扎实开展党纪学习教育，周密部署安排、强化纪律教育，突出以案促学、以案说纪，进一步增强党员干部的政治定力、纪律定力、道德定力、抵腐定力。严把政治关、品行关、作风关、廉洁关，修订《党风廉政意见回复暂行办法》，规范出具党风廉政意见；修订《关于深入贯彻中央八项规定精神进一步加强作风建设的实施办法》等制度，不断巩固作风建设成效。

CRSC has diligently promoted Party discipline learning and education, systematically deployed and strengthened discipline education, emphasized the use of cases to promote the learning and education of discipline. This approach aims to reinforce the political, disciplinary, moral and anti-corruption commitment of Party members and cadres. The company has also upheld strict standards for political ideology, morality, conduct and integrity. It revised the Interim Measures for Making Suggestions on Party Conduct and Integrity, to standardize the issuance of Party conduct and integrity related opinions. Additionally, it updated the Measures for Deepening the Implementation of the CPC Central Committee's Eight Rules and Further Strengthening the Improvement of Party Conduct and other internal rules and regulations to continuously enhance the effectiveness of Party conduct improvement efforts.



中国通号 2024 年党风廉政建设和反腐败工作会议在北京召开

CRSC 2024 Conference on Party Conduct, Integrity and Anti-Corruption Work was held in Beijing

指标 Indicator	单位 Unit	2022	2023	2024
已审结的重大贪腐、舞弊、欺诈、洗黑钱等案件 Number of major corruption, fraud, misuse, money laundering and other cases concluded	件 Pcs	0	0	0
针对公司或雇员提出的贪污诉讼案件 Number of corruption lawsuits filed against the company or its employees	件 Pcs	0	0	0
人均反腐败培训时长 Anti-corruption training hours per participant	小时 Hour	5.8	8.5	9.0
员工反腐败培训覆盖率 Coverage rate of employee anti-corruption training	%	100	100	100

廉洁监督

Integrity supervision

持续完善党风廉政建设和反腐败工作协调小组工作机制，定期召开党风廉政建设和反腐败工作协调小组会议，凝聚监督合力。进一步发挥基层党组织纪检委员作用，强化贯通融合，确保监督无死角。

CRSC remains committed to enhancing the working mechanism of the Party conduct and anti-corruption work coordination group. The company regularly convenes meetings of the Party conduct and anti-corruption work coordination group, to reinforce supervisory efforts and ensure effective oversight. Additionally, it maximizes the role of discipline inspection committee members in grassroots party organizations, enhancing integration and coordination to maintain comprehensive and unobstructed supervision.

推广应用《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，严格规范领导干部和员工的相关行为。充分运用《廉洁风险防控工作手册》，落实各项内部监督制度，强化廉洁风险防范和监督制约机制。

CRSC has actively promoted the application of the Supervision and Discipline Enforcement Work Manual, conducted timely supervision and inspection of case quality and discipline enforcement legitimacy, and strictly regulated the relevant acts of leaders and employees. Additionally, the Integrity Risk Prevention and Control Handbook has been effectively utilized to implement various internal supervision rules and regulations, and strengthen the mechanisms for preventing and supervising integrity risks.

举报管理

Whistleblowing management

建立《纪检信访举报工作管理办法》，严格落实信访举报保密制度，对举报人的姓名、工作单位、住址等有关情况以及举报内容严格保密，坚决做到不将信访举报材料、举报人信息转给或者告知被举报的组织 and 人员；在受理信访举报或者开展核查工作时，做到在不暴露举报人身份的情况下进行；严格落实各项保密要求，保护举报人合法权益。

CRSC has developed the Measures for Managing Discipline Complaint and Whistleblowing Handling Work to enforce strict confidentiality requirements. The company ensures the name, employer, address and other sensitive information of the complainants, informants or whistleblowers, as well as the details of their complaints—are kept strictly confidential and not disclosed to the alleged violating organizations or individuals. Additionally, CRSC guarantees that the identities of complainants, informants, or whistleblowers remain protected during the handling or investigation of relevant cases. All confidentiality measures are rigorously implemented to safeguard the legitimate rights and interests of the complainants, informants or whistleblowers.

信息安全与隐私保护

Information Security and Privacy Protection

中国通号高度重视信息安全管理，严格遵守《中华人民共和国数据安全法》《中华人民共和国个人信息保护法》等法律法规。全年未发生信息安全事件和客户隐私泄露事件。

CRSC places great importance on information security management and strictly adheres to all applicable laws and regulations, such as the Data Security Law of the People's Republic of China and the Personal Information Protection Law of the People's Republic of China. There was no information security incidents or customer privacy breaches throughout the year.

信息安全

Information security

推进公司统一互联网出口和国资国企在线监管平台建设工作的推广和深化。制定《网络安全管理规定》《网络安全工作责任与考核实施办法》《网络安全突发事件专项应急预案》等网络安全相关管理制度，组织开展全级次网络安全和信息系统统计，落实网络安全责任到部门、责任到人。

CRSC has actively promoted the extensive and in-depth implementation of the Group's unified Internet exit, and the construction of an online supervision platform for state-owned assets and enterprises. The company developed a series of network security management regulations, such as the Regulations on Network Security Management, the Measures for Defining Network Security Work Responsibilities and Carrying out Relevant Assessments, and the Special Network Security Emergency Response Plan. Additionally, it organized network security and information system assessments across all levels of all subsidiaries/subordinate units, to break down the network security responsibilities to each responsible department and individual.

报告期内，组织所属企业、单位落实国家网络与信息安全信息通报中心等单位的网络安全通报，健全全级次应急处置机制，确保及时、有效完成闭环处置。开展网络安全攻防演练活动；开展网信人员队伍能力建设，组织网信人员参加网络安全与信息化相关培训。

During the reporting period, CRSC organized its subsidiaries and subordinate units to implement the measures and requirements in the network security notifications from the National Network and Information Security Information Notification Center and other competent authorities. The company also enhanced its emergency response mechanism at all levels of all subsidiaries/subordinate units, to ensure timely and effective closed-loop response. Additionally, CRSC organized network security attack and defense drills and enhanced the capabilities of its cybersecurity teams by providing specialized training in network security and information technology.

隐私保护

Privacy protection

严格遵循个人数据安全准则，“非必要不获取”。针对客户信息，使用统一的客户信息管理系统，设定各级相关人员查阅权限，并设置专职部门负责客户资料保障工作，持续优化网络信息安全，确保客户信息及资料不泄露，有效保障客户权益。

CRSC strictly adheres to personal data security, ensuring that no unnecessary information is accessed. The company employs a unified customer information management system for acquiring, accessing and disposing of customer information, with tiered access permissions assigned to users at different levels. A dedicated department oversees customer data protection, continuously optimizing network information security to ensure zero illegal disclosure of customer information or data. These measures effectively safeguard customer rights and interests.

回应的 SDGs
SDGs



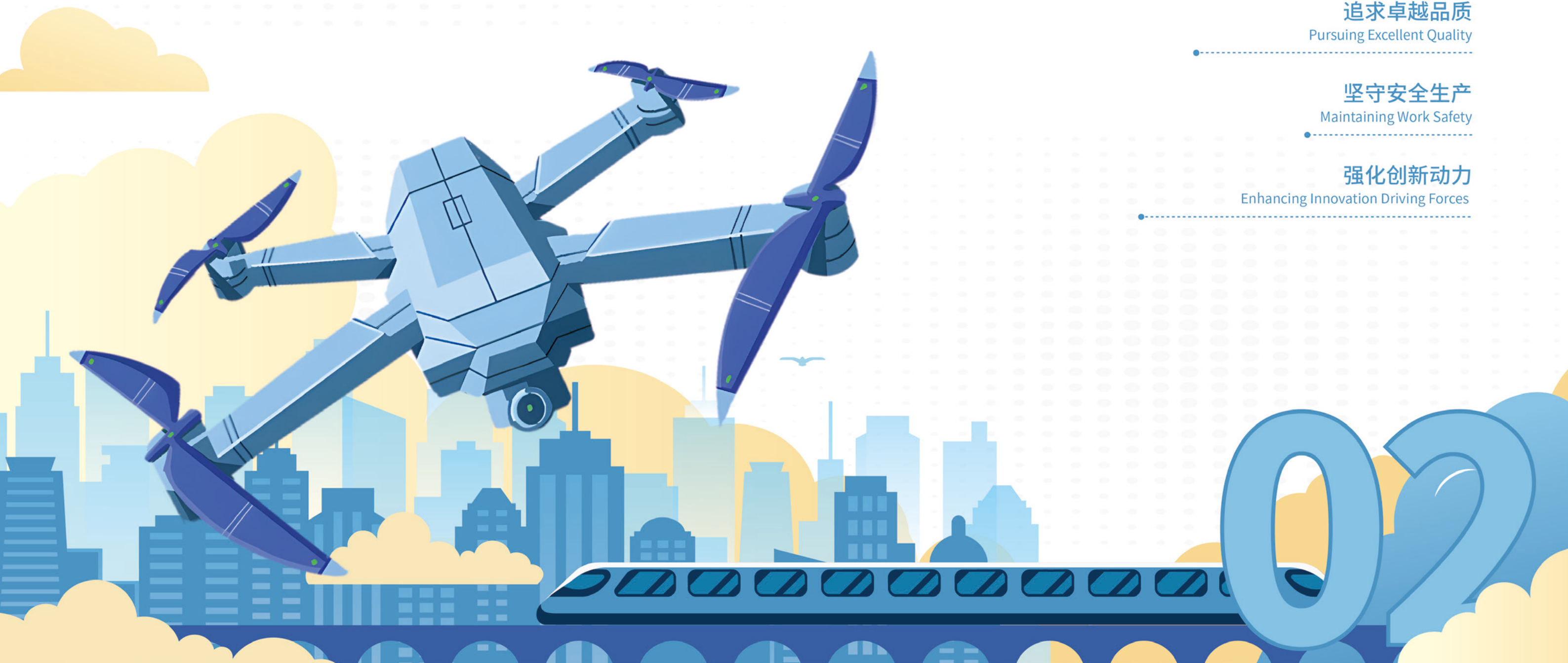
精耕主业 建设世界一流

Building a World-Class Enterprise
by Devotedly Developing Main Business

追求卓越品质
Pursuing Excellent Quality

坚守安全生产
Maintaining Work Safety

强化创新动力
Enhancing Innovation Driving Forces



2022

追求卓越品质 Pursuing Excellent Quality

中国通号始终践行“质量是生命”的发展理念，将质量管理视为企业生存与发展的核心基石，持续深化 QC 小组活动的推广与实践，为高质量发展注入强劲动力。报告期内，未发生产品和服务相关的安全与质量重大责任事故。

CRSC consistently upheld the development concept of "quality is everything," considering quality management as the cornerstone of its survival and growth. It continuously promoted and implemented QC team activities, injecting strong momentum into high-quality development. During the reporting period, there were no major liability accidents related to safety and quality of products and services.

加强质量管理 Strengthening quality management

公司完善质量管理体系建设，规范质量管理流程，形成《可靠性管理办法》《测试案例管理指南》等一系列产品和服务质量相关制度文件。升级总部《管理手册》，进一步规范管理体系架构和管理模式。同时，按照职能模块，以标准化清单方式，完成 142 个管理事项的管理目标、管理依据、业务活动、管理职责、管理内容、对所属单位管控模式、评价与改进、负面清单及数字化支撑等九个方面的管理要点和工作指引，以确保每个环节都有明确的质量标准和操作规范。

CRSC enhanced its quality management system by standardizing its quality management processes. It released a series of product- and service-quality-related documents, such as the Reliability Management Measures and the Guide for Test Case Management. In addition, it upgraded the headquarters' Management Manual to further standardize the management system architecture and management model. At the same time, CRSC adopted a standardized checklist based on functional modules to outline the objectives, foundations, business activities, responsibilities, content, affiliated unit controlling modes, evaluation and improvement, a negative list, and digital support for 142 management items. This checklist included key points and work guidelines, ensuring that each part has defined quality criteria and standard operating procedures.

报告期内，中国通号及所属企业全部通过 ISO 9000 质量管理体系第三方认证。全系统未发生铁路交通一般 C 类及以上责任事故、工程质量一般及以上责任事故、重大质量问题；装备制造产品一次交验合格率达 97% 以上，同比提升 1.1 个百分点；各检验批、分项、分部工程施工质量检验合格率为 100%，单位工程一次交验合格率为 100%，行业产品质量监督抽查合格率 100%；新研发的安全关键产品和城轨信号系统集成项目 100% 实现第三方安全评估，涉及安全关键产品的软件 100% 实现独立安全测试。

以标准化清单方式，
完成管理事项

142 ↑

Adopted a standardized
checklist to support
the execution of 142
management tasks

During the reporting period, CRSC and all its subsidiaries successfully passed third-party certification for the ISO 9000 quality management system. There were no minor (Class C) rail accidents or higher, no minor quality accidents or higher, and no major quality issues within the group. The first pass yield (FPY) for manufactured equipment products exceeded 97%, reflecting a 1.1% year-on-year increase. The pass rate for all batches, items, and sub-projects during construction quality inspections was 100%. The one-time acceptance rate for unit projects was 100%. Additionally, the pass rate for products during spot checks by the competent authority was 100%. The application rate of newly developed safety-critical products and the integration rate of urban railway signal system integration were both 100%. Third parties were engaged to conduct safety assessments, and independent safety testing was conducted on 100% of the software related to safety-critical products.

产品研发阶段 Product R&D stage

采取严格的设计评审和测试验证流程，以确保产品的性能和安全性。
CRSC adopted a rigorous design review, testing, and verification process to ensure both product performance and safety.

生产制造阶段 Production and manufacturing stage

全面实施原材料检验、过程控制、成品检验等环节的质量监控和检验提升方案。
CRSC implemented comprehensive quality monitoring, control, and improvement throughout raw material inspection, process control, and finished product inspection.



案例·Case

中国通号荣列 IPC 全球可信资源库 CRSC was included in IPC's Qualified Manufacturers List

2024 年 12 月，研究设计院集团北信公司顺利通过 IPC 001/610 QML 认证，成功获得国际电子工业联接协会颁发的认证证书。这标志着北信公司被正式纳入 IPC 001/610 QML 全球可信资源库，得到电子产品制造领域的国际级权威认可。

Beijing Railway Signal Co., Ltd., a subsidiary of CRSC Research & Design Institute Group, successfully passed the IPC 001/610 QML validation in December 2024. It also received the certificate issued by IPC. This achievement marks Beijing Railway Signal's official inclusion in the IPC 001/610 Qualified Manufacturers List. This list is an internationally recognized authority in the field of electronic product manufacturing.

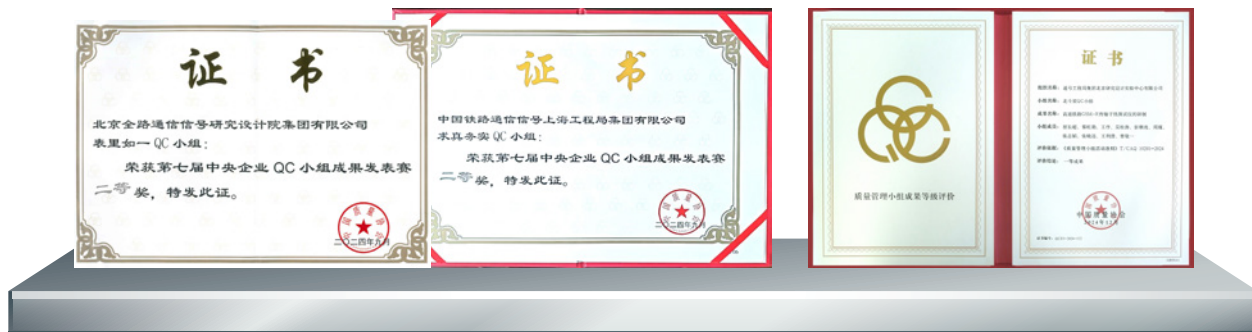


推动 QC 活动

Promoting QC activities

公司高度重视全生命周期质量创新管理，严格执行 PDCA 原则，规范运用质量管理统计工具及方法，务实高效开展 QC 活动，推动 QC 活动在设计、生产制造、工程施工等全业务链条推广，激发广大员工立足岗位，参与质量管理和技术创新的积极性，弘扬精耕细作的工匠精神。2024 年，中国通号研究设计院集团、上海工程局集团、通号工程局集团通过开展 QC 活动形成了一批质量管理优秀成果，为提高产品质量和生产效率作出了卓越贡献。

CRSC attached great significance to quality innovation management throughout the entire life cycle. It strictly implemented the PDCA cycle and standardized the application of quality management statistics tools and methods to effectively and efficiently carry out QC activities. This approach promoted QC activities across the entire business chain, including design, production, manufacturing, and project construction. CRSC also encouraged employees to actively participate in quality management and technological innovation based on their positions, fostering the spirit of meticulous craftsmanship. In 2024, CRSC Research & Design Institute Group, CRSC Shanghai Engineering Bureau Group, and CRRC Engineering Bureau Group achieved a series of excellent results in quality management through QC activities. These efforts made significant contributions to improving product quality and production efficiency.



上海工程局集团、研究设计院集团在 2024 年央企 QC 小组成果发表赛中荣获二等奖

CRSC Shanghai Engineering Bureau Group and CRSC Research & Design Institute Group won the second prize in the 2024 Central SOEs QC Team Achievement Presentation Competition.

通号工程局集团“北斗星 QC 小组”获“全国一等 QC 成果”

The "Beidou Star QC Team" of the CRSC Engineering Bureau Group won the "National First-Class QC Achievement" award.

提供优质服务

Providing quality services

公司严格遵守《中华人民共和国消费者权益保护法》等法律法规，严格遵循适用的服务和产品标签规定，以用户需求为导向、与市场需求接轨，不断提升用户认可度。CRSC strictly complied with all applicable laws and regulations, including the Consumer Rights and Interests Protection Law of the People's Republic of China. It also strictly adhered to all applicable regulations on service and product labeling. In addition, it held to customer orientation, aligning its operations with market demands and continuously improving user recognition.

设置专门部门负责售后服务及投诉解决事宜，采用三级管理模式，力求高质量满足客户需求。项目部建制在项目开通交付后依然保留，并在现场配合客户完成包保、克缺等工作，大部分售后服务在该阶段得以解决；所属企业对本企业负责的项目进

行监督管理，负责协调本企业范围内资源，解决相应问题；公司总部统筹管理售后服务及投诉解决事宜，对本级及全系统重点项目进行监督管控，视客户需求必要时协调全系统相关资源加以解决。

CRSC established a dedicated department responsible for after-sales service and complaint resolution. It adopted a three-level management model, effectively meeting customer needs with high quality. The project department remained active even after the project was opened and delivered, collaborating with customers on-site to complete warranty and defect elimination work. Most after-sales services were resolved during this stage. Each affiliated enterprise supervised and managed its own projects, scheduled its own resources, and resolved corresponding issues. The company's headquarters coordinated and handled after-sales service and complaint matters. It also supervised and controlled key projects across the group and all its subsidiaries and allocated the required resources within the group to address issues based on customer needs.

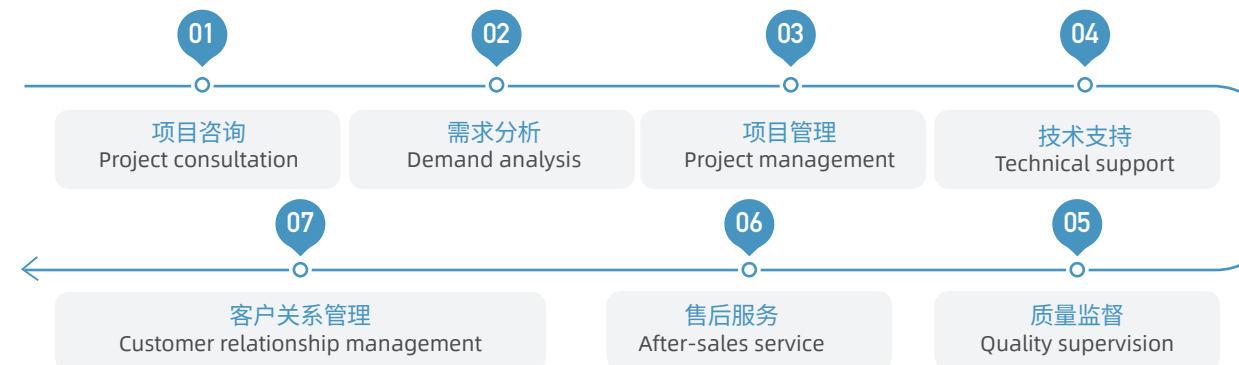
报告期内，公司交付重点工程近百项，顺利完成铁路 II 级以上营业线施工开通 160 次，开通了国内首次全自动运行 FAO 模式下在线联挂解编和跨线互联互通功能的项目，交付了首条全自动无人驾驶项目，重点轨道交通项目建设保障能力和标杆工程建设能力进一步增强。

During the reporting period, CRSC delivered nearly 100 key projects and successfully completed the construction and opening of 160 railway lines of Class II or higher. CRSC has successfully launched the country's first project featuring online coupling and decoupling, as well as cross-line interconnection, in fully automated FAO (Fully Automated Operation) mode. The company has also delivered its first fully automated driverless railway project, further enhancing its capabilities in major rail transit project implementation and benchmark project development.



指标	单位	2022	2023	2024
Indicator	Unit			
客户满意度	%	100	100	100
Customer satisfaction				
投诉解决率	%	100	100	100
Complaint resolution rate				

中国通号客户服务管理体系 CRSC Customer Service Management System



坚守安全生产 Maintaining Work Safety

中国通号将安全生产作为企业发展的核心任务之一，严格遵守《中华人民共和国安全生产法》《中华人民共和国消防法》等法律法规，深入实施安全生产治本攻坚三年行动，不断完善安全管理体系，开展定期的安全培训与应急演练，提升员工的安全意识和应对突发事件的能力。

CRSC considered work safety as one of the core tasks for enterprise development. It strictly abided by all applicable laws and regulations, such as the Work Safety Law of the People's Republic of China and the Fire Protection Law of the People's Republic of China. It actively implemented a three-year action plan to address the root causes of work safety issues and continuously improves its safety management system. In addition, CRSC conducted regular safety training and emergency drills to enhance its employees' safety awareness and ability to respond to emergencies.

安全生产管理

Work safety management

公司夯实安全生产责任制，强化责任考核、依法依规落实安全生产责任制。严格落实“三管三必须”“一岗双责”和全员安全生产责任制。在各层级成立安全生产管理委员会，由公司副总师及以上领导和各部门负责人组成。安全生产管理委员会定期召开会议，研究安全生产相关事项。

CRSC enhanced its work safety accountability system and strengthened responsibility assessments. It also implemented the work safety accountability system in accordance with all applicable laws and regulations. CRSC strictly enforced the principles of "Three Managements and Three Musts," "One Position, Two Responsibilities," and the all-inclusive work safety accountability system. It also established Work Safety Management Committees at all levels, composed of the company's deputy chief engineers or senior leaders and department heads. These committees held regular meetings to discuss and address work safety-related matters.

中国通号安全生产委员会主要职责 Main Duties of CRSC Work Safety Committees



安全风险防控

Prevention and control of safety risks

公司紧扣重大风险辨识管控和重大事故隐患排查治理两个关键环节，对安全生产实行分级分类管控，持续完善安全生产监督机制。

CRSC closely focused on identifying and controlling major risks, as well as investigating and managing major hidden hazards. It applied a graded and categorized management approach to work safety while continuously improving its safety supervision mechanism.

报告期内，全系统共组织开展了2次专项安全隐患大排查大整治，紧盯重点场所和关键环节，严厉整治“五超”（超计划、超范围、超能力、超强度、超定员）和“三违”（违章指挥、违章操作、违反劳动纪律），各层级共开展隐患排查4,301次，发现隐患问题6,376项，整改率100%，下发隐患整改通知1,627项，整改率100%，有效防范化解了重大事故隐患。

During the reporting period, CRSC conducted two special safety hazard inspections and rectification activities across the group, focusing on key workplaces and critical processes. These activities aimed at strictly rectifying the "five excesses" (beyond the corresponding plans, scope, capacity, intensity, and staffing) and "three violations" (non-compliant commands, non-compliant operations, and violations of labor discipline). A total of 4,301 hazard identifications were performed at all levels, uncovering 6,376 hidden hazards. All identified issues were rectified, achieving a 100% rectification rate. In addition, 1,627 hazard rectification notices were issued, achieving a 100% rectification rate. This effectively prevented and eliminated major hidden hazards.

安全应急管理

Emergency response management

公司建立完善的安全应急管理体系，高标准做好在轨运营设备应急保障工作。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》等制度，涵盖预警机制、应急响应、救援演练等多个环节。

CRSC established a comprehensive emergency response management system. It also provided high-standard emergency support for in-service rail equipment. In addition, it formulated various internal rules and regulations, including the Emergency Response Plan for Malfunctions of Rail Transit Operation Equipment and the General Emergency Response Plan Against Accidents and Disasters. These plans covered multiple aspects, such as early warning mechanisms, emergency response actions, and rescue drills.

修订完善应急预案

178

A total of 178 emergency response plans were revised and upgraded across the Group

应急救援演练

636

636 emergency rescue drills were organized

安全教育培训

Safety education and training

专业知识培训

2,600

Professional training activities were organized for over 2,600 participants from the entire Group

报告期内，全系统共修订完善应急预案 178 个，目前共有应急预案 3,261 个，其中综合应急预案 286 个、专项预案 1,465 个、现场处置方案（含应急处置卡）1,510 个，应急体系进一步完善。全年组织开展应急救援演练 636 场，参与 16,762 人次，开展从业人员自救互救技能培训 173 场，有效增强了应急预案的科学性、实用性和操作性。

During the reporting period, a total of 178 emergency response plans were revised and upgraded across the group. To date, there are 3,261 emergency response plans, including 286 general emergency response plans, 1,465 special emergency response plans, and 1,510 on-site response plans (including emergency response cards). These plans contribute to the continued improvement of the emergency response system. Throughout the year, 636 emergency rescue drills were organized, engaging 16,762 participants. In addition, 173 self-rescue and mutual rescue skills training sessions were conducted. These sessions effectively enhanced the scientific, practical, and operational aspects of the emergency response plans.

公司注重安全文化建设，制定《安全生产教育培训管理办法》，定期组织各类安全培训，增强员工安全意识和自我保护能力，做到从源头防控安全隐患，确保公司生产和运营在安全可控的环境中进行。

CRSC placed great emphasis on building a safety culture. It formulated the Measures for Managing Work Safety Education and Training. It also regularly organized various safety training activities to enhance employees' safety awareness and self-protection abilities. These efforts also helped prevent and control safety hazards at the source and ensured that the company's production and operations were carried out in a safe and controlled manner.

报告期内，公司举办“人人讲安全，个个会应急，畅通生命通道”为主题的年度安全生产教育培训会。全体领导班子成员参加本次安全生产教育培训。通过培训，增强了各级领导抓好安全生产工作的政治意识和责任意识，进一步提高了全员做好安全生产工作的思想意识和管理能力，为强化企业安全生产主体责任的落实落地奠定坚实的基础。组织全系统 2,600 余人次参加《铁路建设项目安全穿透式管理》等专业知识培训，有效提升了一线安全质量管理人员的知识和履职执行力。

During the reporting period, CRSC conducted an annual work safety education and training session themed "Everyone Pays Attention to Safety, Everyone Knows How to Respond to Emergencies, and Everyone Contributes to Clear Exit Passageways." All members of the leadership team participated in this session. This activity enhanced the political awareness and sense of responsibility among leaders at all levels in promoting work safety. It also improved the ideological awareness and management abilities of employees and workers, ensuring strict adherence to work safety requirements. This laid a solid foundation for strengthening the efficient and effective implementation of enterprise responsibilities in ensuring work safety. In addition, several professional training activities, such as the "Railway Construction Project Safety Penetrating Management," were organized for over 2,600 participants from the entire group. These activities effectively enhanced the knowledge and execution skills of frontline safety and quality management personnel.

强化创新动力 Strengthening Driving Forces for Innovation

中国通号坚持以智控为根技术，聚焦轨道交通和低空经济“双赛道”，倾力打造轨道交通安全控制领域原创技术策源地，不断推动产品创新升级，为高质量发展注入强劲动能。

CRSC considered intelligent control as its root technology, focusing on the "dual tracks" of rail transit and the low-altitude economy. It strived to establish itself as a hub for original technologies in rail transit safety control while continuously advancing product innovation and upgrades to drive high-quality development.

布局低空经济 Making overall arrangement for developing low-altitude economy (LAE) business

公司紧跟国家政策和市场需求，布局发展低空经济新赛道，明确培育低空空域管控、无人机制造、服务运营，构建低空经济生态的“三业一态”产业格局。

CRSC followed national policies and capitalized on market opportunities to embark on a new path for developing the LAE business, to formulate a new business framework of "three business lines and one ecosystem" to foster low-altitude airspace control, unmanned aerial vehicle manufacturing and service offering activities, and create a low-altitude economy ecosystem.

强化资源保障

Strengthening resource security

组织成立战略新兴产业事业部和战略投资部，设立通号资本运营公司和通号低空智能科技有限公司。锁定国内低空经济先发城市，先后与合肥、南京、成都、南安、广州等 9 个城市签署战略合作协议，落地通号低空经济（合肥）科技有限公司、石家庄交投智能交通科技有限公司、通号青铁低空经济（青岛）科技有限公司等 3 家地方合资公司。分类开展市场布局，加快低空应用落地，在“轨道融合”“工业巡检”“低空物流”“低空文旅”“空中交通”等方面取得显著成效，打造合肥工业巡检、重庆地铁巡检、云南怒江州高山农业运输、湛江西至海口“空铁联运”跨海航线等示范项目。

CRSC established a Strategic Emerging Industries Business Unit and a Strategic Investment Department, as well as CRSC Capital Operation Co., Ltd. and CRSC Low-Altitude Intelligent Technology Co., Ltd. Targeting domestic pioneer cities in the low-altitude economy, it signed strategic cooperation agreements with 9 cities in succession, including Hefei, Nanjing, Chengdu, Nan'an, Guangzhou. It also established 3 local joint ventures, including CRSC Low-Altitude Economy (Hefei) Technology Co., Ltd., Shijiazhuang Jiaotou Intelligent Transportation Technology Co., Ltd., and CRSC Qingtie Low-Altitude Economy (Qingdao) Technology Co., Ltd. Moreover, it designed a strategic business layout for developing markets, based on classification, to expedite the implementation of low-altitude applications. Furthermore, it made significant progress in areas such as "rail integration," "industrial spot inspection," "low-altitude logistics,"

携手共谋发展

Seeking common
development

"low-altitude cultural tourism," and "air traffic." CRSC initiated multiple demonstration projects, such as industrial inspection in Hefei, subway inspection in Chongqing, high-altitude agricultural transportation in Nujiang Prefecture, Yunnan, and the "air rail intermodal" cross sea route from Zhanjiang West to Haikou.

为突破“低空+物流”“低空+载人”“低空+城市治理”三大场景，与中国邮政、中信集团、中国铁塔3家央企共拓低空领域的运营服务场景。牵头高校申报“低空空域智能管控北京市重点实验室”，实验室作为高能级创新平台，对树立行业地位、持续打造科技创新能力具有重要意义。申请北京市“低空空域智能管控及安全保障技术重点实验室”，已正式授牌。

To make breakthroughs in the three major areas of "low-altitude + logistics," "low-altitude + manned," and "low-altitude + urban governance," CRSC partnered with three central SOEs—China Post, CITIC Group, and China Tower—to explore operational service scenarios in the low-altitude domain. It also led universities to apply for the "Beijing Key Laboratory of Low-Altitude Airspace Intelligent Control" as a high-energy innovation platform. This initiative is crucial for establishing a strong position in the industry and continuously enhancing scientific and technological innovation capabilities. In addition, CRSC submitted an application to establish the "Fengtai District, Beijing Key Laboratory of Low-Altitude Airspace Intelligent Control and Security Technology." The license for the laboratory has now been officially issued.



案例·Case

中国通号成功举办低空经济院士论坛暨通号低空公司揭牌仪式

CRSC successfully held the Low-Altitude Economy Academician Forum and the Inauguration Ceremony of CRSC Low-Altitude Company

2024年10月23日，中国通号在京成功举办低空经济院士论坛暨通号低空智能科技有限公司揭牌仪式，中国通号党委书记、董事长楼齐良与与中国工程院院士、中国科学院院士共同为通号低空智能科技有限公司揭牌，并构建以“低空空域管控”为核心，以“低空通信、感知反制、无人机、数字底座”四项为协同的“1+4”创新联合体系。此次会议的召开，标志着中国通号在低空经济领域迈出了关键一步，为我国低空经济创新发展注入了新动力。

On October 23, 2024, CRSC successfully hosted the Low-Altitude Economy Academician Forum and the Inauguration Ceremony of CRSC Low-Altitude Intelligent Technology Co., Ltd. in Beijing. Lou Qiliang, Secretary of the Party Committee and Chairman of CRSC, along with the members of the Chinese Academy of Engineering (CAE) and the Chinese Academy of Sciences (CAS), unveiled the nameplate of CRSC Low-Altitude Intelligent Technology Co., Ltd. to build a "1+4" joint innovation framework with "low-altitude airspace control" as the core and "low-altitude communication, perception and countering, unmanned aerial vehicles, and digital bases" as the four collaborative elements. This event marked a significant milestone for CRSC in the low-altitude economy sector. It injected new momentum into the innovative development of the low-altitude economy in China.



院士一行听取中国通号自主研发的低空空域智能管控系统ID-Space等研究进展情况

The delegation of CAE members listened to the research progress of CRSC's independently developed low-altitude airspace intelligent control system, "ID-Space," along with other technologies

2024 年中国通号低空经济领域创新成果

Innovative achievements in CRSC's low-altitude economy sector in 2024

01

自主研发低空空域智能管控系统，具备准入管理、空域管理、计划流控、空中交通管控等核心功能，实现对无人机直接控制、多架飞行器间隔追踪运行、飞行计划自动审批等功能，创下行业首例，支撑地方政府承接空域管理职责；

CRSC independently developed a low-altitude airspace intelligent control system, which has many core functions, such as access management, airspace management, planning flow control and air traffic control, to achieve direct control of UAVs, tracking and operation of multiple aircrafts at intervals, automatic approval of flight plans, setting an industry first and supporting local governments to undertake airspace management responsibilities.

02

低空智能巡检系统具备全自动运行控制和轨道保护区智能监测两大功能特色，为轨道交通行业从人工巡检向智能无人巡检转型提供了技术支持和实践经验；

The low-altitude intelligent spot inspection system of CRSC has two key functional features: fully automated operation control and intelligent monitoring of rail protection areas. It provides technical support and practical experience for the transformation of the rail transit industry from manual to intelligent, unmanned spot inspections.

03

基于6G无蜂窝专网，融合4G/5G公网、卫星通信构建分层组网、公专融合、星地协同的低空通信系统，实现低空全程全域连续通信覆盖，为低空飞行器提供坚实、可靠的通信保障；

CRSC built a low-altitude communication system characterized in layered networking, public private integration, and satellite ground cooperation by integrating 4G/5G public network and satellite communication based on 6G non-cellular private networks, to achieve continuous communication coverage throughout the low altitude and provide solid and reliable communication support for low altitude aircraft.

04

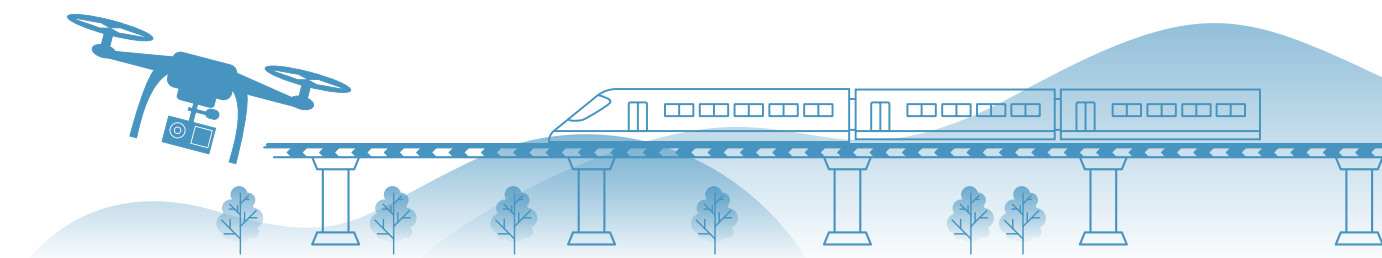
首创静电探测技术，突破传统雷达盲区，实现3公里内“低慢小”目标的无盲区精确识别，突破反向接管技术，实现对非合作飞行器的信号拦截与控制接管，为城市立体低空安全体系建设提供技术支撑；

CRSC was the first to develop electrostatic detection technology, and made breakthroughs in addressing the traditional radar blind spots and achieving precise identification of "low, slow and small" targets within 3 kilometers without blind spots. It also made breakthroughs in the reverse takeover technology and achieved signal interception and control takeover of non-cooperative aircrafts, providing technical support for the construction of a three-dimensional low-altitude safety system in cities.

05

确定了无人机“电动化、垂直化、无人化、小型化”的“四化”技术发展路线，推进无人机产业落地。

CRSC determined the technology development route towards the "electrified, verticalized, unmanned, and miniaturized directions" for unmanned aerial vehicles, promoting the landing of the unmanned aerial vehicle industry.





首次发布自主研发的低空空域智能管控系统 ID-Space1.0 版

CRSC released its independently developed low-altitude airspace intelligent control system "ID-Space V1.0" for the first time

2024 年 8 月 1 日，南京吨级以上 eVTOL 航空器长江首飞活动在浦口高新区隆重举行。中国通号首次发布了自主研发的低空空域智能管控系统 ID-Space1.0 版，护航 eVTOL 航空器、P4 垂起固定翼无人机、多旋翼无人机融合飞行，这是业内首次实现同一时间、同一空域，多架不同类型、不同任务的航空器融合飞行，打破了不同类型航空器独占空域的限制，为安全高效利用有限的空域资源树立了典范。



低空空域智能管控系统 ID-Space 护航跨江融合飞行

Low-altitude airspace intelligent control system "ID-Space" escorting aircraft in mixed fleet flying across the Yangtze River

On August 1, 2024, the maiden flight of the Yangtze River "eVTOL" aircraft, with a tonnage of [X] and above, was grandly held in the Pukou High-Tech Zone, Nanjing. CRSC debuted its self-developed low-altitude airspace intelligent control system, "ID-Space 1.0." This system escorted the eVTOL aircraft, P4 VTOL fixed-wing UAV, and multi-rotor UAV for mixed fleet operations. This marks the first time in the industry that multiple aircraft of different types and purposes fly together at the same time and in the same airspace, breaking the traditional practice of exclusive airspace allocation for different aircraft types. It also sets a new benchmark for the safe and efficient utilization of limited airspace resources.

通号档案：

CRSC's file:



中国 AOPA 协会
AOPA-China

中国航空器拥有者及驾驶员协会简称“中国 AOPA”，是国际航空器拥有者及驾驶员协会（IAOPA）在中国的分支机构，是 IAOPA 在中国（包括港澳台）的唯一合法代表。协会于 2004 年 8 月 17 日在中国民政部登记注册，由中国民用航空局业务指导，代表中国私用航空器拥有者及驾驶员利益，接受国际航空器拥有者及驾驶员协会监督、指导及相关规章约束的全国性社团组织。

The Aircraft Owners and Pilots Association of China ("AOPA-China" for short) is the Chinese branch of the International Council of Aircraft Owner and Pilot Associations (IAOPA). It is the only legal representative of IAOPA in China (including Hong Kong, Macau, and Taiwan). AOPA-China was registered with the Ministry of Civil Affairs of the People's Republic of China on August 17, 2004, under the guidance of the Civil Aviation Administration of China. It represents the interests of Chinese private aircraft owners and pilots and operates as a national social organization, accepting supervision, guidance, and relevant regulations from IAOPA.

创新驱动发展

Driving development with innovation

公司充分发挥国家战略科技力量和技术创新的主体作用，持续加大科技创新和成果转化力度，攻克“卡脖子”核心技术难题，优化提升科技创新体系，促进科技成果转化和推广，建设高水平创新平台，更好实现高水平科技自立自强。

CRSC fully leveraged the nation's strategic scientific and technological strengths by playing a key role in technological innovation. It continuously increased efforts in scientific and technological innovation and the transformation of achievements, overcoming critical technological "bottlenecks." In addition, it optimized and upgraded its scientific and technological innovation system and promoted the transformation and application of scientific and technological achievements. Moreover, it built a high-standard innovation platform to better achieve high-level scientific and technological self-reliance and self-improvement.

开展标准建设

Promoting standardization



中国通号城交公司获颁

《民用无人驾驶航空器运营合格证》

CRSC Urban Rail Transit Technology Co., Ltd. obtained the Civil Unmanned Aerial Vehicle Operation Certificate and the Civil Unmanned Aerial Vehicle Pilot Training Institution Certificate, enabling them to conduct flight performance testing, third-party testing, and training.

坚持标准先行，积极开展资质认证，加快推动更加完善、科学、高效的标准体系建设。与民航总局、工业和信息化部装备中心在无人机接口标准、身份码信息标准等方面开展合作；加入中国 AOPA 协会并任常务理事单位，共建“低空智能航空标准化技术委员会”；作为核心单位参编《低空智能网联体系参考架构（2024 版）》白皮书。此外，中国通号城交公司等多家子企业获颁《民用无人驾驶航空器运营合格证》《民用无人机驾驶员培训机构合格证》，具备开展飞行性能测试、第三方检测和培训等资质。

CRSC adhered to the principle of 'standards first,' actively conducting qualification certification and accelerating the development of a more comprehensive, scientific, and efficient standards system. It cooperated with the Air Traffic Management Bureau of the Civil Aviation Administration of China (CAAC/ATMB) and the Equipment Center of the Ministry of Industry and Information Technology on projects such as UAV interface standards and identity code information standards. CRSC also joined the Aircraft Owners and Pilots Association of China (AOPA-China) as an executive director unit to jointly establish the Low-Altitude Intelligent Aviation Standardization Technical Committee. In addition, it participated, as a key actor, in the preparation of the white paper "Low-Altitude Intelligent Networking Architecture (2024 Edition)." Furthermore, several subsidiaries, including CRSC Urban Rail Transit Technology Co., Ltd., have obtained the Civil Unmanned Aerial Vehicle Operation Certificate and the Civil Unmanned Aerial Vehicle Pilot Training Institution Certificate, enabling them to conduct flight performance testing, third-party testing, and training.

指标	单位	2022	2023	2024
Indicator	Unit			
研发投入 R&D investment	亿元 CNY 100 million	18.74	20.38	20.38
累计拥有研发人员 Total number of R&D personnel	人 Person	4,428	4,345	5,064
开展科研项目 Number of scientific research projects launched	个 Pcs	806	871	835
承担国家级科研项目 Number of national-level scientific research projects undertaken	个 Pcs	4	5	5
承担省部级科研项目 Number of provincial- and ministerial-level scientific research projects undertaken	件 Pcs	7	7	9
新增国家级奖励 Number of new national-level incentives	项 Item	2	2	0
新增省部级奖励 Number of new provincial and ministerial-level incentives	项 Item	45	70	61

创新体系建设

Building of innovation system

建立完备的科技创新管理体系，不断完善科技管理制度，已形成《科技管理办法》《科研项目管理办法》《科研项目经费使用管理办法》《技术标准管理办法》《知识产权管理办法》《科技成果评审管理办法》《科技奖励管理办法》《实验室管理办法》等系列管理办法，并同步形成科技创新考核体系和支持政策，科技创新机制高效运行。

CRSC established a comprehensive system for managing scientific and technological innovation to continually enhance its science and technology management system. It formulated a series of management measures, including the Science and Technology Management Measures, Research Project Management Measures, Research Project Fund Use Management Measures, Technical Standard Management Measures, Intellectual Property Management Measures, Scientific and Technological Achievements Review Management Measures, Science and Technology Awards Management Measures, and Laboratory Management Measures. Additionally, CRSC simultaneously established a scientific and technological innovation assessment system and support policies, ensuring the efficient and effective operation of the innovation mechanism.

创新平台建设

Development of innovation platforms

强化创新平台建设，加快培育和建设省部级及以上创新平台，全面提升创新创效能力。截至 2024 年末，公司共拥有 3 个博士后科研流动工作站、3 个院士工作站、12 个国家和行业创新平台、21 个国家级创新示范、38 个省部级重点实验室 / 工程技术研究中心 / 工程实验室。

CRSC strengthened the development of innovation platforms and accelerated their creation at both the principal and higher levels to comprehensively enhance innovation and efficiency capabilities. By the end of 2024, the company had a total of 3 postdoctoral research mobile stations, 3 academician stations, 12 national and industry innovation platforms, 21 national-level innovation demonstrations, and 38 provincial- and ministerial-level key laboratories/engineering technology research centers/engineering laboratories.

报告期内，公司获批成为轨道交通安全控制技术原创策源地，推进策源地专项行动计划，关键核心技术攻关稳步推进；中国城市轨道交通协会批复依托中国通号建立通信信号标准分委会 SC15，完成机构组建方案；加入国家自然科学基金委铁路基础研究联合基金，推动研究设计院集团获批成为基金委项目依托单位，引导全社会优势科研力量开展轨道交通通信信号领域应用基础研究。

During the reporting period, CRSC was approved as an incubation base for original rail transit safety control technologies. This approval promoted the special action plan for creating an original technology incubation base and supported the steady advancement of research and development in key core technologies. The China Association of Metros approved the establishment of the Communication and Signal Standards Subcommittee SC15, which depends on CRSC, and completed the organization scheme. CRSC also joined the Joint Fund for Railway Basic Research of the National Natural Science Foundation of China. In addition, it promoted the approval of the CRSC Research & Design Institute Group as a project support unit of the Foundation. Moreover, it guided the advantageous scientific research forces from across society to conduct applied basic research in the field of rail transit communication signals.

博士后科研流动工作站

3 个

The Company had a total of 3 postdoctoral research mobile stations

国家和行业创新平台

12 个

12 national and industry innovation platforms

创新人才队伍

Innovative talent team

制定《加强高端科技人才培养方案》，多措并举加强高层次科技人才引进和培养，从经费支持、平台搭建、服务保障等相关方面入手，优化高层次人才干事创业环境，积极推荐和培育国家科技创新创业领军人才，打造通信信号人才汇聚高地。

CRSC developed the Plan for Strengthening the Training of High-end Scientific and Technological Talents. It also implemented multiple measures in parallel to enhance the introduction and training of high-level scientific and technological professionals. The plan optimized the working and entrepreneurial environment for high-level talents. It focused on funding support, platform development, service guarantees, and other related aspects. Additionally, the plan aimed to actively recommend and nurture leading talents in national science, technology innovation, and entrepreneurship, creating a hub for gathering CRSC talents.

以高层次人才为重点，依托重点产业、重点项目、创新中心、博士后科研工作站和劳模创新工作室等，着力培养造就专业技术水平精湛，掌握核心前沿技术，在行业内具有较高威望和影响力的高端技术专家。以基层人才为基础，创新专业技术人才培养模式，坚持学习与实践相结合、培养与使用相结合，提高科技研发技术水平。

CRSC focused on high-level talent and strived to nurture top-tier technical experts with exceptional professional technical skills, mastery of core cutting-edge technologies, and high prestige and influence in the industry. By relying on frontline talent, the company explored new training modes for professional and technical talents. It continued to integrate learning with practice and training with real-world application. This approach enhanced the level of scientific and technological research and development.

对接国务院国资委“百—万—百万”科技人才培养工程，到 2025 年，选拔和培育 10 位中国通号科学家、首席专家为核心的国家级领军人才队伍，100 位中国通号高级专家、战略专家和青年拔尖人才为代表的行业级高端人才，1,000 位核心骨干为代表的企业级核心科技人才，从事科技创新的研发人员占从业人员比例达到 25%。

CRSC responded to the SASAC's "Hundreds-Ten Thousands-Millions" Science and Technology Talents Program. The company aims to select and nurture a nationally leading talent team. The team will consist of 10 CRSC scientists and chief experts as the core, 100 industry-level high-end talents represented by CRSC senior experts, strategic experts, and young top talents, and 1,000 enterprise-level key scientific and technological talents represented by core elites. By 2025, the proportion of R&D personnel engaged in scientific and technological innovation is expected to reach 25% of the workforce.

选拔中国通号科学家

10 位

The Company aims to select and nurture a nationally leading talent team consisting of 10 CRSC scientists and chief experts

行业级高端人才

100 位

100 industry-level high-end talents

企业级核心科技人才

1,000 位

1,000 enterprise-level key scientific and technological talents

科技创新成果

Achievements in scientific and technological innovation

公司坚持“四个面向”，加强基础性、紧迫性、前沿性、颠覆性技术研究，在多个领域取得突破。

CRSC adhered to the "four orientations" and strengthened research in fundamental, urgent, cutting-edge, and disruptive technologies to achieve breakthroughs in multiple fields.

重大科研项目 Major scientific research projects

基于轨旁数智化的 两级列控系统研究 Research on a two-level train control system based on trackside digital intelligence

完成城轨和地方铁路系统需求、系统架构设计，逻辑集中部署系统、供电一体化模块试制，开展轨旁通用目标控制器、数字化转辙机、智能 LEU 的样机试制。
Completed the requirement validation and architecture design for urban rail and local railway systems. Conducted the trial production of the logic-centralized deployment system and the power supply integration module. Carried out prototype testing for the trackside universal target controller, digital switch machine, and intelligent LEU.

编组站智能化关键技术 研究及装备研制项目 Research on key technologies and equipment development for intelligent marshaling yards

完成总体技术方案编制，编组站决策支持数据平台系统、机务段信号集中管控、基于即时决策的进路自动控制等关键技术在成都北站开展试用。
Completed the overall technical plan. Conducted trials of key technologies, including the marshaling yard decision support data platform system, centralized control of locomotive depot signals, and automatic route control based on real-time decision-making, at Chengdu North Station.

四电数字孪生设计仿 真运维一体化平台研 究项目 Research on an integrated platform for the design, simulation, operation, and maintenance of digital twins for 4 E/E projects

打通设计、装备、施工、运维全流程数据，提升数字化输出能力，完成总体技术方案、四电工程构型原则及钩型详表以及四电数字设计基础平台建设，开展示范应用。
Connected data across design, equipment manufacturing, construction, operation, and maintenance. Enhanced digital output capabilities and completed the overall technical plan, configuration principles, and detailed tables for hook types. Established the digital design foundation platform for the communication, signal, electric power transmission and distribution, and traction power supply projects ("4 E/E Projects").

数字城轨解决方案研究 Research on digital urban rail solutions

完成数字城轨核心功能模块原型发布和数字城轨上海市地方标准编制。
Released the prototype of the core functional module for digital urban rail and completed the compilation of local standards for digital urban rail in Shanghai.

基于高可靠车车通信和高可信车地 协同的高效能启骥 TACS 系统 High-efficiency Qiji TACS system based on reliable train-to-train communication and train-to-ground collaboration

于 2024 年底完成适配版本发布，适用于上海 3、4 号线项目的全线高速动态调试，支持 30 辆车的全线跑车。
The adapted version has released by the end of 2024. It is designed for high-speed dynamic debugging of the entire Shanghai Line 3 and Line 4 projects and supports the full line operation of 30 trains.

空地网一体化全域智能感知系统研究与应 用研发的视频 AI 解析赋能平台 V2.0 和视 频 AI 驾驶舱应用平台 V2.0 及移动端产品 Video AI parsing empowerment platform V2.0, video AI cockpit application platform V2.0, and mobile products developed by the research and application of the integrated air-ground-network intelligent full situational awareness system

已在大理、聊城、菏泽、济南、青岛等地交付使用。
They have been delivered and used in places such as Dali, Liaocheng, Heze, Jinan, Qingdao, and other locations.

复杂恶劣环境下的车载控车及 系统集成方案研究 Research on onboard train control and system integration solutions in complex and harsh environments

完成雨雪等复杂环境的信号系统多专业联动及多级制动率参数防护调节策略技术方案，在西安地铁 10 号线完成了现场验证。
Completed the development of a technical solution for multi-specialty linkage and multi-level braking rate parameter protection adjustment strategy for the signal system in complex environments, such as rain and snow. Conducted on-site verification for Xi'an Metro Line 10.

科技成果转化 Transformation of scientific and technological achievements

数字化货场 Digital freight yard

开展磨憨二期工程，通过自动化装备将在海关查验区率先实现无人作业，提升货场作业自动化水平。
Led the Mohan Phase II Project, the first to achieve unmanned operations in the customs inspection area using automated equipment, thereby improving the automation level of freight yard operations.

铁路 400MHz 数字无线列调 系统 Railway 400MHz digital wireless train dispatching system

完成通过呼局集二线国铁集团试用期考核，通过国铁集团组织的技术评审，并取得上道许可。
Passed the trial use period assessment by Hohhot Rail on its Ji-Er Line, successfully completed the technical review organized by China Railway, and received approval for use in railway operations.

高铁车载智能诊断系统和货运站场自动驾驶系统

Onboard intelligent diagnostic system for high-speed rail and automatic train operation system for freight stations/yard

分别获得郑州局和首钢商业合同，进一步扩大应用业绩。
Secured commercial contracts with Zhengzhou Rail and Shougang Group, further enhancing application performance.

城轨智能运维系统平台

Urban rail intelligent operation and maintenance system platform

中标郑州地铁 4 号线 /14 号线综合运维委外维保、青岛 7 号线二期工程信号系统。
Won the bid for the comprehensive operation and maintenance outsourcing of Zhengzhou Metro Line 4/Line 14 and the signal system for the Qingdao Line 7 Phase II Project.

基于智能运控平台的车辆调系统

Train dispatching system based on intelligent operation control platform

顺利取得济南 6 号线的商业合同。
Successfully secured the commercial contract for Jinan Line 6.

自主研发的基于卫星定位的移动闭塞列控系统

Independently developed a mobile block train control system based on satellite positioning

成功中标几内亚马西铁路及支线大单。
It successfully won the bid for a major order in the Morebaya-Simandou Railway Project in Guinea and its branch line.

国家重大工程技术创新

Technological innovation in China's major projects

轨道交通调度控制一体化与联程运输服务技术项目

Rail transit dispatching, control integration, and intermodal transportation service technology project

完成理论体系框架关键理论技术研究，完成多制式兼容一体化车载 ATP/ATO 样机、列车安全控制中心设备、列控联锁一体化设备临时限速服务器样机研制。
Completed key theoretical and technical research on the theoretical framework and successfully developed a multi-standard compatible integrated onboard ATP/ATO prototype, train safety control center equipment, and a temporary speed limit server prototype integrated with train control interlocking equipment.

面向群组列车运行控制的高安全高精度定位技术及应用示范项目

High-safety and high-precision positioning technology and application demonstration project for group train operation control

完成项目基于北斗列车定位技术的群组列控系统定位、测速授时及感知需求、群组定位、测速授时及感知方案及授时算法，完成基于北斗列车定位技术样机，配套群组列控系统完成测试。
Completed the positioning, speed measurement, timing, and situational awareness requirements, along with the group positioning, speed measurement timing, situational awareness scheme, and timing algorithm of the group train control system based on BeiDou Navigation Satellite System (BDS) train positioning technology. Completed the prototype based on BDS train positioning technology and the testing of the supporting group train control system.

重载列车群组运行控制系统技术研究与应用项目

Research and application project on heavy-duty train group operation control system technology

完成群组控制系统各设备测试验证、群组控制系统测试及验证以及第一、二阶段上道试验及外部专家评审。
Completed equipment testing and verification for the group control system, as well as testing and verification of the group control system itself, including the first and second-stage on-track testing and reviews by external experts.

中国铁路通信信号股份有限公司
2024年面向专业投资者公开发行科技创新
永续期公司债券（第一期）
成功发行

创中央企业永续期公司债券10+N年期最低票面利率！

债券简称	期限	发行利率	发行规模	认购倍数
通号YK01	5+N	2.20%	15	5.79倍
通号YK02	10+N	2.40%	10	3.48倍

发行人 CRSC 中国通号

牵头主承销商 国新证券股份有限公司 CHINA REFORM SECURITIES CO., LTD.

联席主承销商 中信建投证券股份有限公司 CHINA SECURITIES CO., LTD.

评级机构 大公国际资信评估有限公司

会计师事务所 BDO 立信

会计师事务所 EY 安永

律师事务所 ZHONG LUN 中倫律師事務所

首次发行科技创新永续期公司债券 25 亿元，亦是科创板央企的首支科技创新公司债券

CRSC issued its first technology innovation renewable corporate bond, valued at CNY 2.5 billion. This was also the first technology innovation corporate bond issued by a central SOE on the SSE STAR Market



研究设计院集团开启智慧货场无人机自动化巡检新篇章

CRSC Research & Design Institute Group wrote a new chapter in intelligent freight yard unmanned aerial vehicle based on automated spot inspection

研究设计院集团研制夷道智慧货场无人机自动巡检系统，以智能化无人机为基础，综合利用自主导航技术、机载传感技术、数据处理与分析技术等多种先进技术，根据现场作业需求定制巡检任务，辅助货运员一键启动对作业区域进行快速预检，实现货车巡检、堆场巡检和场内巡检，升级巡检模式，为货场自动化巡检开启新篇章。

The CRSC Research & Design Institute Group has developed an unmanned aerial vehicle-based automated spot inspection system for Yidao Smart Freight Yard. This system integrates various advanced technologies, including autonomous navigation, airborne sensing, and data processing and analysis, to tailor spot inspection tasks based on on-site operational needs. It helps freight operators perform rapid pre-inspections of the operation area with a one-click start, conducting inspections of trucks, cargo, and the yard. This innovation upgrades the inspection process and sets a new standard for automated spot inspections in freight yards.



夷道智慧货场无人机自动巡检系统

An unmanned aerial vehicle-based automated spot inspection system for Yidao Smart Freight Yard



卡斯柯发布“羲和”数字城轨解决方案

CASCO released "Xihe" Digital Urban Rail Transit Solution



“羲和”数字城轨解决方案架构图

Architecture diagram of "Xihe" Digital Urban Rail Transit Solution

On June 28, 2024, CASCO unveiled the "Xihe" Digital Urban Rail Transit Solution at the "2024 Digital Urban Rail Innovation Forum." This solution focuses on enhancing operational safety and resilience. Built on an independently developed, open rail transit digital base and a scalable signal control professional model, it features two key platforms: the intelligent operation control platform and the intelligent operation & maintenance platform. By integrating a range of intelligent application products, the solution supports the digital and intelligent transformation of the industry. It positions itself as a leader in the urban rail signal sector and a symbol of new, high-quality productive force.

2024年6月28日，卡斯柯在“2024数字城轨创新论坛”上重磅发布了“羲和”数字城轨解决方案。该方案专注于提升运营安全与韧性，基于自主研发的开放式轨交数字底座和可扩展的信控专业模型，构建了智能运控、智能运维两大平台，集成了一系列智能应用产品，以助力行业数字化、智能化转型升级，成为城轨信号领域新质生产力的代表。

知识产权保护

Intellectual property protection

中国通号恪守《中华人民共和国民法典》以及刑法、专利法、商标法和著作权法等涉及知识产权的相关法律。公司内部建立《知识产权管理规定》，规范公司知识产权的授权、保护和应用流程；开展专利导航情报研究，通过对重点关键技术导航及其重点专利微导航分析，支撑海外业务和新兴领域业务拓展。

CRSC adhered to the Civil Code of the People's Republic of China, as well as all relevant laws and regulations concerning intellectual property, including criminal law, patent law, trademark law, and copyright law. It implemented the Internal Regulations on Intellectual Property Management to standardize the licensing, protection, and utilization processes of intellectual property rights. In addition, CRSC conducted research on patent navigation intelligence. Based on the analysis of key technology navigation and patent micro-navigation, it provided support for the expansion of overseas business and emerging fields.

报告期内，公司2个高价值专利培育中心建设项目通过了当地知识产权局组织的阶段验收，共3家企业获得知识产权国家示范企业称号，新获得中国专利奖优秀奖1项。公司多件产品获得首批国家专利密集型产品认定，专利管理水平、专利产品的竞争力和附加值逐步提升。

During the reporting period, the construction projects for the company's two high-value patent incubation centers passed the stage acceptance organized by the local intellectual property office. Three subsidiaries were recognized as National Demonstration Enterprises for Intellectual Property, and CRSC once again won the China Patent Excellence Award. Several of the company's products were included in the first list of national patent-intensive products. Meanwhile, the patent management capabilities, competitiveness, and added value of patented products gradually improved.

指标	单位	2022	2023	2024
Indicator	Unit			
累计拥有有效授权专利 Total number of valid patents granted	件 Pcs	3,929	4,618	5,248
累计拥有发明专利 Total number of patents for invention granted	件 Pcs	1,649	2,434	3,091
应用于主营业务的发明专利数量 Number of patents for invention applied in main business	件 Pcs	1,649	2,434	3,091
累计拥有海外授权专利 Total number of patents granted overseas	件 Pcs	211	281	345
累计拥有软件著作权 Total number of software copyrights granted	件 Pcs	1,793	2,606	3,053
新增授权专利 Number of patents newly granted	件 Pcs	876	820	765
新增授权发明专利 Number of patents for invention newly granted	件 Pcs	591	667	624
新增申请专利 Number of patents newly applied for	件 Pcs	1,339	1,510	1,658
新增申请发明专利 Number of patents for invention newly applied for	件 Pcs	1,119	1,281	1,496
新增申请海外专利 Number of patents newly applied for overseas	件 Pcs	142	170	177

加速数字化转型

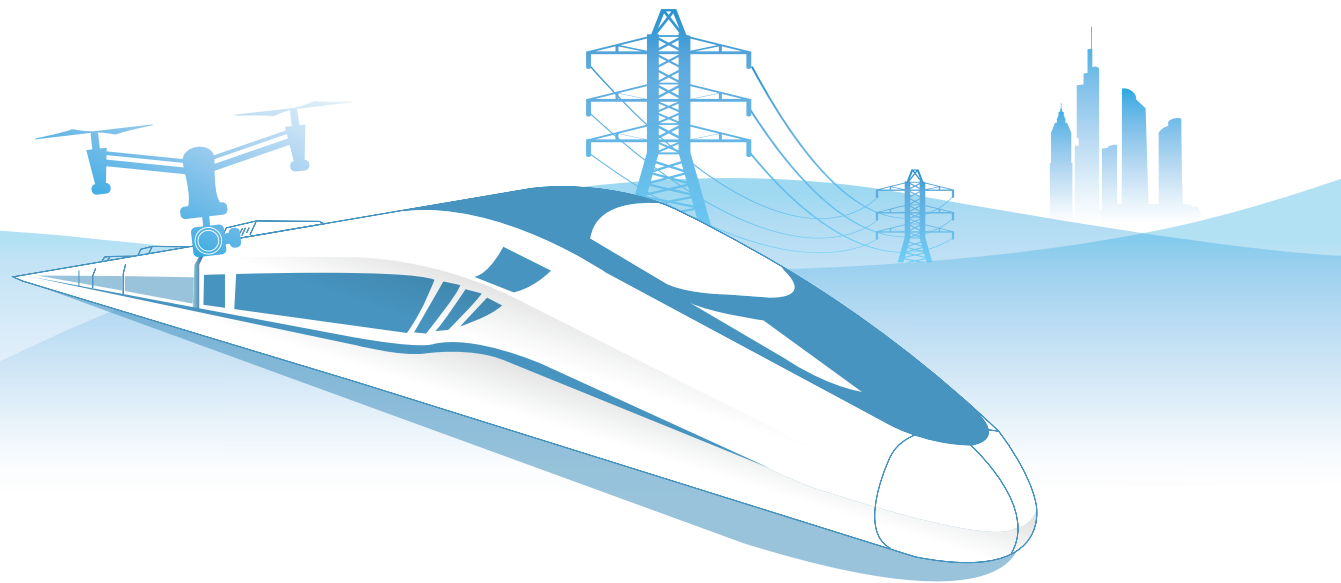
Accelerating digital transformation

公司将数字化转型视为提升竞争力的关键手段，制定《中国通号数字化转型行动计划》，编制《中国通号数字化转型智能工程实施方案》及各所属企业数字化转型方案计划，加速各项任务实施进程。

CRSC considered digital transformation a key strategy for enhancing competitiveness. To accelerate the implementation of various tasks, it developed the CRSC Digital Transformation Action Plan and formulated the CRSC Digital Transformation-Based Intelligent Project Implementation Plan. It also created several subsidiary digital transformation plans and solutions.

开展精益数字化转型顶层设计，打造轨道交通控制领域全产业链数智化平台，涵盖从工程设计、研究开发、生产制造、系统集成、工程施工及售后服务全链条，构建“工程设计+工程服务一体化、产品研发+集成实施一体化、硬件设计+生产制造一体化”三个一体化协同，以智能产品、智能工程、智能运维、智能经营“四个智能化建设”为核心，以“一个数字基座”为坚实支撑，全面带动并实现公司数字化转型，培育数字化发展新动能。

The company adopted a top-level design for lean digital transformation. It has also created a digital intelligence platform for the entire industry chain. This platform covered engineering design, research and development, production and manufacturing, system integration, engineering construction, and after-sales service. In addition, CRSC established three integration-based synergies: "engineering design + engineering service integration, product research and development + integrated implementation, and hardware design + production and manufacturing integration." Moreover, it drove its digital transformation in all aspects to generate new energy for digital development. This was centered on the "four intelligent abilities" (intelligent products, intelligent engineering, intelligent operation and maintenance, and intelligent management), with the "one digital base" serving as the solid foundation.



“数字基座” Digital Base

作为数字化转型基础，为中国通号提供统一的数据平台，支撑各业务板块数据共享、业务协同和创新发展。
As the foundation of digital transformation, it offers a unified data platform for CRSC, facilitating data sharing, business synergy, and the innovative development of all business sectors.

四个智能化建设 Four intelligent abilities

智能产品 Intelligent products

研发轨道交通新一代高端智能装备，深化工业智能制造的发展，用数字化技术贯通产品设计、生产、测试、交付、运维等全生命周期，提升产品的智能化水平，满足市场对高品质、高性能产品的需求。

Developed a new generation of high-end intelligent equipment for rail transit, driving the advancement of intelligent industrial manufacturing. Utilized digital technology to connect product design, production, testing, delivery, operation, and maintenance across the entire lifecycle, enhancing the intelligence of products to meet the market's demand for high-quality and high-performance products.

智能工程 Intelligent engineering

运用数字孪生、人工智能等先进技术优化工程设计、施工和管理，提高工程质量和效率，降低工程成本，提升工程交付能力。

Utilized digital twins, artificial intelligence, and other advanced technologies to optimize engineering design, construction, and management; improve engineering quality and efficiency; reduce engineering costs; and enhance engineering delivery capabilities.

智能运维 Intelligent operation and maintenance

推进新型数字化运维生产管理体系构建，打造轨道交通综合智能运维平台，提升运维服务的响应速度和处置能力，为用户提供优质综合运维服务。

Promoted the development of a new digital operation, maintenance, and production management system. Created a comprehensive intelligent operation and maintenance platform for rail transit to enhance the response speed and capability of operation and maintenance services and provide users with high-quality comprehensive operation and maintenance services.

智能经营 Intelligent management

运用数字化手段优化企业经营管理流程，提升公司管理水平，实现企业经营的精细化、高效化和智能化。

Took digital measures to optimize enterprise management processes, enhance enterprise management levels, and enhance the refinement, efficiency, and intelligence of enterprise operations.



案例·Case

研究设计院集团四电数字孪生设计仿真运维一体化平台赋能项目建设

CRSC Research & Design Institute Group empowered the construction of projects through its digital twin-based design simulation and integrated operation & maintenance platform for four E/E projects

研究设计院集团开展四电数字孪生设计仿真运维一体化平台建设，致力于铁路四电工程的数字化与智能化建设，旨在打造一个覆盖工程设计至工程交付全过程的综合性数字管理平台。以“工程设计+工程服务一体化”为核心，全面整合四电工程建设流程，打破四电系统全生命周期的信息孤岛，为铁路四电的设计管理、建设管理、仿真测试和运营维护提供强大的数字化支持。通过实现工程项目的高效率、精确性、协同作业和智能化管理，有效降低工程建设成本与风险，推进铁路智能建造高质量发展。

The CRSC Research & Design Institute Group launched a digital twin-based design simulation and operation & maintenance integration platform for communication, signal, electric power transmission and distribution, and traction power supply projects ("4 E/E Projects"). This platform drove the digital and intelligent construction of the 4 E/E Projects, aiming to create a comprehensive digital management system that covers the entire process, from engineering design to project delivery. Focusing on the integration of engineering design and services, this platform streamlined the construction process and broke information silos across the entire lifecycle of the 4 E/E project systems. It also provided strong digital support for the design management, construction management, simulation testing, and operation & maintenance of the 4 E/E projects. By achieving high efficiency, high precision, collaborative operation, and intelligent management of projects, it effectively reduced the construction costs and risks while promoting the high-quality development of intelligent railway construction.



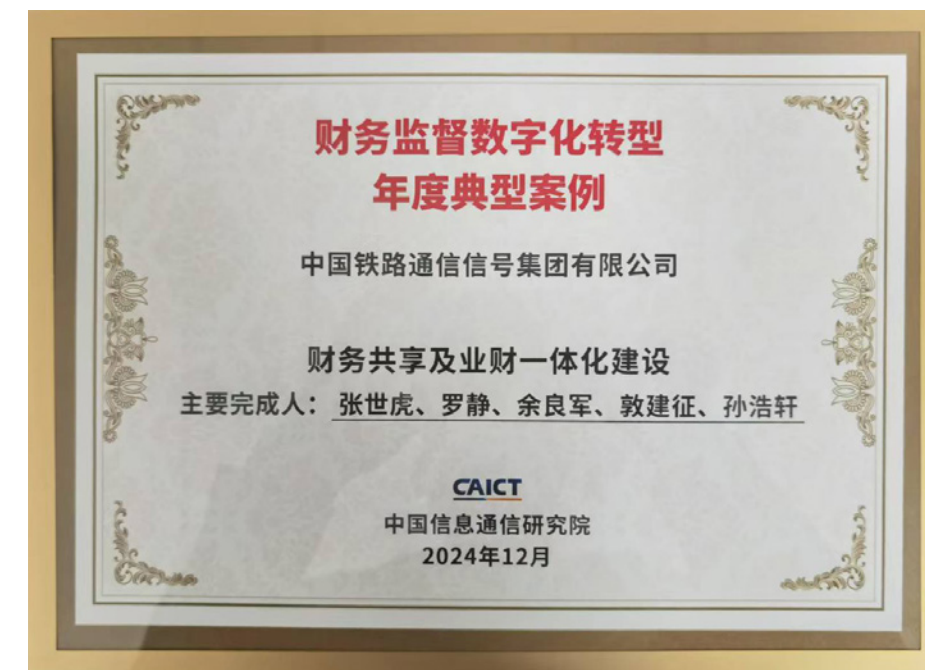
案例·Case

中国通号财务共享及业财一体化项目屡获殊荣

CRSC's financial sharing and business-finance integration project won numerous awards

2024年5月，中国通号财务共享及业财一体化项目正式投入使用，标志着中国通号成功迈出了“业财税金票”五位一体管控的第一步，在财务管理和业务运营融合方面取得了历史性突破。此次上线的平台涵盖了财务共享中心、业财一体化统一数据平台、商旅平台、司库结算、统一身份认证、统一门户和主数据管理平台，同时，实现了移动端商旅订票、待办集成和流程审批的同步运行。2024年，该项目荣获“鼎新杯”全国数字化转型应用优秀案例三等奖、新华网2024数字经济创新优秀案例、“财务监督数字化转型年度典型案例”。

In May 2024, CRSC officially launched its financial sharing and business-finance integration project. This marked a significant milestone in integrating business, finance, taxation, cash flow, and financial invoicing." This achievement represents a historic breakthrough in merging financial management with business operations. The platform launched this time includes a financial sharing center, a unified data platform for business and finance integration, a business travel platform, a treasury settlement, a unified identity authentication, a unified portal, and a master data management platform. In addition, CRSC realized the synchronous operation of mobile business travel booking, to-do-list integration, and routine approval. In 2024, the project won third place in the "Dingxin Cup" National Excellent Case of Digital Transformation Application. It was also selected as one of the 2024 Excellent Cases of Digital Economy Innovation by xinhuanet.com and received recognition as the Typical Case of Financial Supervision Digital Transformation of the Year.



中国通号获评“财务监督数字化转型年度典型案例”

CRSC received recognition as the Typical Case of Financial Supervision Digital Transformation of the Year

回应的 SDGs
SDGs



以绿为笔 绘就绿水青山

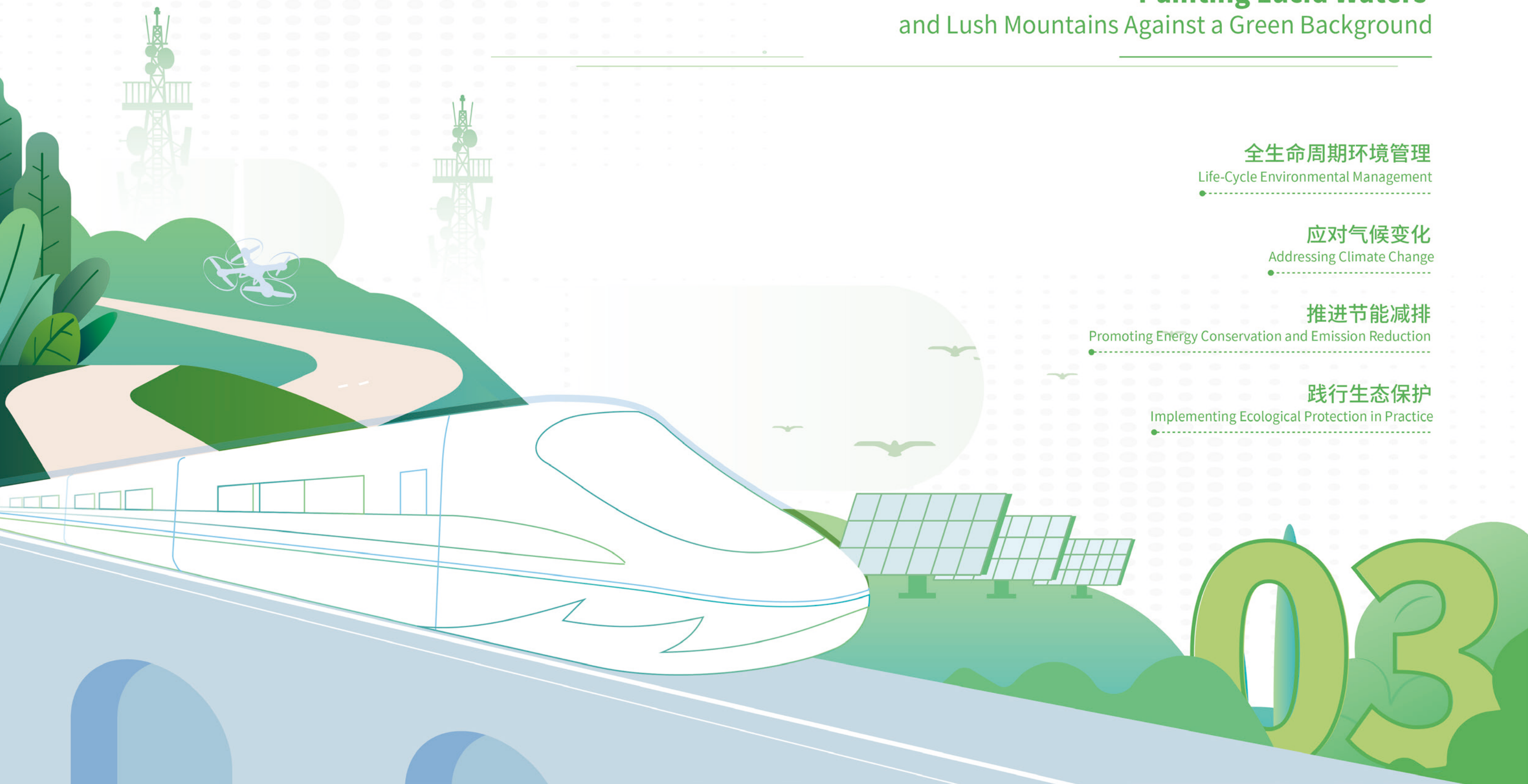
Painting Lucid Waters
and Lush Mountains Against a Green Background

全生命周期环境管理
Life-Cycle Environmental Management

应对气候变化
Addressing Climate Change

推进节能减排
Promoting Energy Conservation and Emission Reduction

践行生态保护
Implementing Ecological Protection in Practice



03

全生命周期环境管理 Life-Cycle Environmental Management

中国通号严格遵守《中华人民共和国环境保护法》《中华人民共和国节约能源法》《建设项目环境保护管理条例》等对公司运营有重大影响的法律法规，建立并持续完善公司环境保护制度，加强对重要环境因素的识别和管理。报告期内，未发生突发环境事件。

CRSC strictly adhered to all laws and regulations significantly impacting its operations, including the Environmental Protection Law of the People's Republic of China, the Energy Conservation Law of the People's Republic of China, and the Regulations on Environmental Protection Management of Construction Projects. It also established and continuously improved its internal rules and regulations on environmental protection. In addition, it enhanced the identification and management of key environmental factors. No environmental emergencies occurred during the reporting period.

环境管理架构 Environmental management architecture

公司节约能源与生态环境保护领导小组负责公司节约能源与环境保护总体工作。

The Internal Leading Group for Energy Conservation and Environmental Protection oversees the overall planning and coordination of the company's energy conservation and environmental protection work.

中国通号节约能源与生态环境保护领导小组主要职责

Main Duties of CRSC's Leading Group for Energy Conservation and Environmental Protection

- 贯彻落实国家有关节能环保的法律法规和标准规范
Implement national laws, regulations, standards, and specifications related to energy conservation and environmental protection
- 负责公司节能环保总体工作，研究部署、指导协调公司节能环保工作
Plan, organize, study, deploy, guide, and coordinate the company's energy conservation and environmental protection initiatives
- 负责研究制定公司节能环保工作的重大方针政策
Study and formulate major policies and guidelines for the company's energy conservation and environmental protection initiatives
- 分析节能环保形势，研究解决节能环保工作中的重大问题
Analyze the status of energy conservation and environmental protection, study, and address major issues in energy conservation and environmental protection work
- 审定和下达年度节能环保控制考核指标
Approve and issue annual targets for controlling and assessing energy conservation and environmental protection work
- 研究按照行业管理中涉及节能环保的方针政策 and 法规标准，加强节能环保和科技进步等基础工作，协调解决相关问题
Further promote energy conservation, environmental protection, technological progress, and other foundational work, while coordinating and resolving related issues in accordance with applicable industry guidelines, policies, regulations, and standards
- 负责统一协调指挥公司重特大环保突发事件应急救援工作
Coordinate and oversee the company's major environmental emergency response efforts



环境管理制度体系 Environmental management framework

公司积极推动环境管理体系建设，不断完善环境管理机制，制定《节约能源与生态环境保护管理办法》《节约能源与生态环境保护监督管理办法》《节约能源与生态环境保护奖惩及责任追究管理办法》等环境管理制度。全系统新制定、修订节能环保制度 35 个，现有节能环保制度共计 210 个，有效建立节能环保长效机制，确保在日常生产和运营中能够贯彻绿色发展理念。

CRSC actively promoted the development of its environmental management system, continually enhancing its environmental management mechanisms. It also formulated numerous internal environmental management rules and regulations, such as the Regulations on Energy Conservation and Ecological Environment Protection, the Rules for Supervision on Energy Conservation and Ecological Environment Protection, and the Rules for Incentives, Punishments, and Accountability for Energy Conservation and Environmental Protection. 35 new sets of internal rules and regulations for energy conservation and environmental protection were formulated and revised across the group. A total of 210 sets were enforced. This established an effective long-term mechanism to promote energy conservation and environmental protection, ensuring the integration of green development principles into daily operations and production.

报告期内，完成对《建设项目“三同时”管理办法》的修订，增加了建设项目环境影响评价、环境保护设施设计及审查、环境保护设施验收报告以及建设项目环境保护设施的排污许可要求等条目，进一步明确了职责分工、“三同时”的执行以及监督检查等，杜绝了新污染的产生；制定《环境保护约谈办法（试行）》，进一步落实环境保护管控，防范环境保护事故事件发生，督促企业落实环境保护主体责任，有效开展环境问题整改工作。

During the reporting period, CRSC revised the regulations on the "Three Simultaneities" of construction projects. The revisions included the addition of items such as the environmental impact assessment for construction projects, the design and review of environmental protection facilities, acceptance reports for environmental protection facilities, and requirements for pollutant discharge permits for these facilities. These changes further clarified the division of responsibilities and the implementation of the "Three Simultaneities" (which ensures that pollution prevention and control facilities in construction projects are designed, constructed, and put into operation simultaneously with the main project). In addition, they strengthened supervision and inspection, effectively preventing the generation of new pollution. In addition, CRSC developed the Rules for Interview-Based Supervision and Correction of Environmental Protection Issues (Trial) to further implement environmental protection control and prevent environmental protection accidents and incidents. These rules also encouraged subsidiaries to fulfill their corporate social responsibilities regarding environmental protection and effectively carry out environmental problem rectification work.

环境风险管理 Environmental risk management

公司加强对环境因素的管控，依据《环境因素识别及评价管理办法》，对环境因素进行全面识别，对重要环境因素加强管控，加强风险点排查和隐患治理，防范环境事件发生；加大监督检查力度，督促企业落实节能与环保主体责任。

CRSC intensified the control of environmental factors by thoroughly identifying them. It also strengthened control over key environmental factors. In addition, CRSC enhanced risk point investigation and hidden danger management in accordance with the Rules for Identification and Evaluation of Environmental Factors. This was done to prevent environmental incidents. Moreover, CRSC devoted greater supervision and inspection efforts to urge subsidiaries to fulfill their corporate social responsibilities for energy conservation and environmental protection.

环保培训与教育 Environmental training and education

公司加大节能环保的宣传培训力度，创新宣传培训方式，提高全员环保意识，推动绿色低碳生产和生活方式的形成。

CRSC intensified its efforts in training and educating employees on energy conservation and environmental protection. It also innovated its education and training methods to enhance the environmental awareness of all employees and promote the adoption of green and low-carbon production and lifestyle patterns.

报告期内，组织全系统开展“六五”环境日、“全国节能宣传周和全国低碳日活动”，共计 37,520 余人次参与活动；公司相关企业 13 名骨干参加中国节能协会“能源管理师”（高级）培训并取证，提高了专业技能和管理水平，推动节能环保治理能力提升。

During the reporting period, the company organized "World Environment Day" and "National Energy Conservation Promotion Week and National Low-Carbon Day" activities across the group. These activities engaged a total of over 37,520 participants. 13 key personnel from the subsidiaries took part in the "Senior Energy Management Specialist" training sessions organized by the China Energy Conservation Association. They received qualification certificates, which enhanced their professional skills and management capabilities, particularly in the areas of energy conservation and environmental protection.

报告期内，组织全系统开展“六五”环境日、“全国节能宣传周和全国低碳日活动”，共计

37,520 余人次

During the reporting period, the company organized "World Environment Day" and "National Energy Conservation Promotion Week and National Low-Carbon Day" activities across the group. These activities engaged a total of over 37,520 participants.



2024 年 8 月，中国通号举办“双碳”背景下节能技术与管理实务培训

In August 2024, CRSC offered a training course on energy conservation technology and management practices in line with the "dual-carbon goals"

应对气候变化 Addressing Climate Change

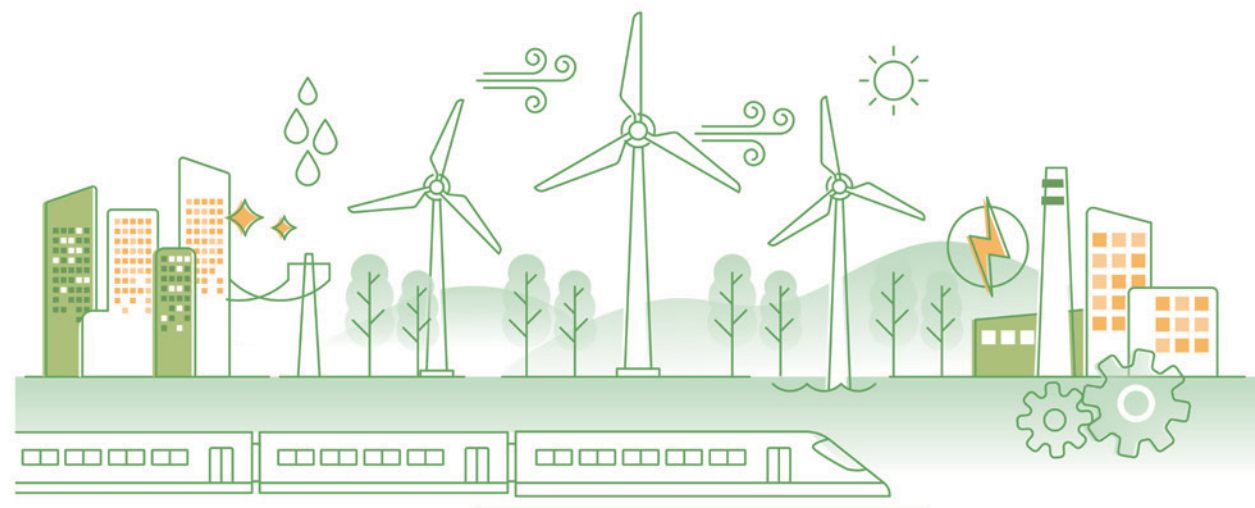
中国通号积极响应全球气候变化挑战，参考联交所、上交所关于气候相关信息的披露要求，从治理、战略、风险管理、指标与目标四个方面出发，持续加强气候风险管理和披露工作。

CRSC actively responded to the global challenge of climate change by strengthening its climate risk management and disclosure efforts in four key areas: governance, strategy, risk management, and indicators and targets. This was done in accordance with the disclosure requirements set by stock exchanges for disclosing climate-related information.

气候变化治理 Climate change governance

公司成立“双碳”工作领导小组和工作小组，全面统筹推进“双碳”工作，监督气候相关风险和机遇的治理。所属企业成立相应领导机构，主要负责人是本企业“双碳”工作第一责任人，其他有关负责人在职责范围内承担相应责任，制定责任清单，分解落实到位。公司将“双碳”工作作为干部教育培训体系重要内容，增强和提高各级领导干部抓好绿色低碳发展的能力和水平。

CRSC established a "Dual-Carbon" Leading Group and a Working Group to comprehensively coordinate and promote the "dual-carbon" initiatives (carbon peaking and carbon neutrality), as well as oversee the management of climate-related risks and opportunities. Each subsidiary formed its own leading group, with its principal acting as the person responsible for its "dual-carbon" initiatives. Other relevant individuals assumed corresponding responsibilities within their scope of duties. A list of responsibilities was created to ensure that implementation duties were clearly assigned to each responsible individual. The company also integrated the "dual-carbon" initiatives into the cadre education and training system to enhance the abilities and capacity of leaders and cadres at all levels to promote green and low-carbon development.



“双碳”工作领导小组主要职责

Main Duties of the "Dual-Carbon" Leading Group

- 组织制定中国通号“双碳”工作行动方案；
Organize the development of CRSC's "dual-carbon" action plan.
- 全面统筹协调推进“双碳”工作开展；
Coordinate and oversee the overall implementation of "dual-carbon" initiatives.
- 研究解决“双碳”工作中遇到的重大问题；
Study and resolve major challenges encountered in the "dual-carbon" efforts.
- 总结推广经验、做法，推进建立长效机制，确保实现“双碳”工作目标。
Summarize and share successful experiences and practices, promote the establishment of long-term mechanisms, and ensure the achievement of "dual-carbon" work goals.

“双碳”工作小组主要职责

Main Duties of the "Dual-Carbon" Working Group

- 落实领导工作小组要求，监督检查“双碳”工作进度，落实“双碳”工作。
Implement the directives of the Leading Group, oversee and monitor the progress of "dual-carbon" initiatives to promote the effective execution of "dual-carbon" work.

气候变化战略 Strategy for addressing climate change

公司及各所属企业制定了2024年度“双碳”及节能环保工作计划，积极稳妥有序推进“双碳”及节能环保工作计划，压实各方工作责任，确保如期高质量完成各阶段工作目标任务。

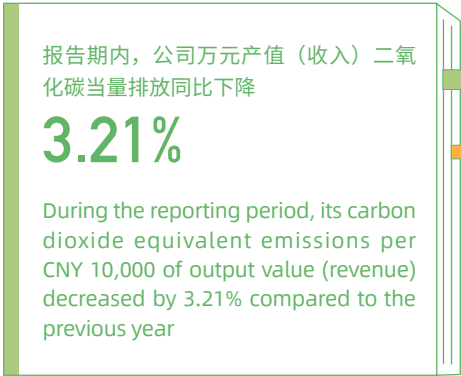
CRSC and its subsidiaries formulated their respective 2024 "dual-carbon," energy conservation, and environmental protection work plans. They actively, steadily, and systematically promoted the implementation of these plans. They also assigned responsibilities to each responsible individual at all levels to ensure the high-standard completion of work objectives and tasks on schedule at each stage.

指标与目标

Indicators and targets

采取多种措施持续减少二氧化碳等温室气体的排放。报告期内，公司万元产值（收入）二氧化碳当量排放同比下降 3.21%。

CRSC implemented numerous measures to continuously reduce greenhouse gas emissions, including carbon dioxide. During the reporting period, its carbon dioxide equivalent emissions per CNY 10,000 of output value (revenue) decreased by 3.21% compared to the previous year.



指标	单位	2022	2023	2024
Indicator	Unit			
温室气体排放总量 Total greenhouse gas (GHG) emissions	吨 Ton	74,039	68,126	57,415
范围一温室气体排放总量 Scope 1 GHG emissions	吨 Ton	20,730	20,181	16,212
范围二温室气体排放总量 Scope 2 GHG emissions	吨 Ton	53,309	47,945	41,203
万元产值温室气体排放量 GHG emissions per CNY 10,000 of output value	吨 / 万元 Ton/CNY 10,000	0.0186	0.0183	0.0181

气候风险管理

Climate risk management

基于国家政策、行业特点、自身业务特点及营运特性等多维度的考量，积极主动识别气候变化带来的风险与机遇，提升公司对于气候变化的适应能力，推动轨道交通行业绿色可持续发展。

CRSC proactively identified the risks and opportunities presented by climate change through a multidimensional analysis. It considered factors such as national policies, industry characteristics, business characteristics, and operation features. It did this to enhance its adaptability to climate change and promote the green and sustainable development of the rail transit industry.

风险	风险描述	应对措施
Risks	Descriptions	Countermeasures
物理风险 Physical risks	台风、暴雨、高温等极端天气可能导致轨道交通信号系统、电气设备损坏，影响铁路和城市轨道交通的安全运营	增强设备耐候性，提高极端天气下的稳定性 Enhance the weather resistance of equipment to improve stability under extreme weather conditions
急性风险： 极端天气 Acute physical risks: extreme weather	Extreme weather conditions, such as typhoons, rainstorms, and high temperatures, can damage rail transit signal systems and electrical equipment, thereby impairing the safe operation of both railways and urban rail transit	建立气候监测与预警系统，降低安全风险 Establish a climate monitoring and early warning system to mitigate safety risks 加强极端天气条件下的巡检维护，制定应急预案 Strengthen spot inspections and maintenance during extreme weather conditions. Create emergency response plans
物理风险 Physical risks	可能影响轨道材料的稳定性、信号设备的寿命及运营效率，增加维护成本	增强设备耐候性，提高极端天气下的稳定性 Enhance the weather resistance of equipment to improve stability under extreme weather conditions.
慢性风险： 气温上升 Chronic physical risks: Temperature rise	May affect the stability of track materials, reduce the service life and operational efficiency of signal equipment, and increase maintenance costs	增加绿色低碳施工工艺 Increase green and low-carbon construction technologies
转型风险 Transition risks	国家“双碳”目标推动轨道交通行业加快低碳转型，若未能及时适应相关政策，可能面临合规成本上升和市场竞争压力	持续跟踪“双碳”政策与轨道交通低碳标准 Continuously track "dual-carbon" policies and low-carbon standards for rail transit.
政策与法规 Policies and regulations	The national "dual-carbon goals" accelerate the low-carbon transformation in the rail transit industry. If the company fails to adapt to relevant policies in a timely manner, it may face increased compliance costs and greater market competition pressure	推动产品符合国家与国际低碳标准，提升市场竞争力 Promote product compliance with national and international low-carbon standards to enhance market competitiveness
转型风险 Transition risks	客户对绿色低碳交通系统的需求增加，若未能提供节能环保的信号控制和智能运维方案，可能导致市场份额下降	推进能源绿色低碳转型和能源体系调整 Promote the green and low-carbon transformation of energy and the adjustment of the energy system
市场需求变化 Changes in market demand	The increasing demand for green and low-carbon transportation systems from customers may result in a decline in market share if energy-saving, eco-friendly signal control, and intelligent operation and maintenance solutions are not provided	拓展绿色交通市场，研发节能高效信号解决方案 Expand the green transportation market and develop energy-saving and efficient signal solutions
转型风险 Transition risks	数字化、智能化、低碳化技术变革加速，若研发跟进不足，可能影响公司在行业中的竞争力	优化能耗管理，提高整体能效 Optimize energy consumption management and improve overall energy efficiency
技术升级压力 Technological upgrade pressure	The rapid advancements in digital, intelligent, and low-carbon technologies can impact the company's competitiveness in the industry if its research and development efforts fail to keep up with these changes	推进数字化运维，提高能源利用效率 Promote digital operations & maintenance to enhance energy efficiency

推进节能减排 Promoting Energy Conservation and Emission Reduction

中国通号坚持绿色发展理念，提升能源与资源使用效率，推动能源结构转型，坚持清洁生产，促进经济与环境效益协同增长。

CRSC adhered to the concept of green development, improved energy and resource efficiency, and drove the transformation of the energy structure. It also emphasized clean production and promoted the balanced growth of both economic and environmental benefits.

节约能源资源 Saving energy and resources

能耗管理

Energy consumption management

中国通号能源使用包含电力、液化气、柴油、热力、天然气。公司通过完善管理机制、推进可再生能源应用等途径，践行高效的绿色运营。

The energy consumed by CRSC included electricity, liquefied gas, diesel, heat, and natural gas. CRSC focused on efficient green operations by improving management mechanisms and promoting the application of renewable energy.

报告期内，西安工业集团沈信公司、西信公司完善能源管理体系，顺利通过年度审核；津信公司建立能源管理体系并通过现场认证审核；研究设计院集团北信公司依据顺利通过企业绿色信用复评，保持“绿色信用四星级企业”荣誉。

During the reporting period, Shenyang Railway Signal Co., Ltd. and Xi'an Railway Signal Co., Ltd., both subsidiaries of CRSC Xi'an Industry Group Co., Ltd., enhanced their energy management systems and successfully passed their annual audits. Meanwhile, Tianjin Railway Signal Co., Ltd., another subsidiary of CRSC Xi'an Industry Group Co., Ltd., established an energy management system and passed on-site certification audits. Additionally, Beijing Railway Signal Co., Ltd., a subsidiary of CRSC Research & Design Institute Group Co., Ltd., was once again rated as a "Green Credit Four Star Enterprise" after successfully passing its enterprise green credit re-evaluation.

推进能源体系调整 Promoting the adjustment of the energy system



推进光伏建设项目。西安工业集团西信公司、津信公司屋顶分布式光伏发电项目、通号轨道光储充光伏项目实现并网发电。光伏项目装机容量共计 7.9MWP，每年为企业提提供清洁电能 435.33 万千瓦时，年均节约标煤 549.2 吨，减排二氧化碳 2,482.36 吨。

Promoted photovoltaic projects. The grid connection and power generation were successfully implemented for the rooftop distributed photovoltaic power generation projects of Xi'an Railway Signal Co., Ltd. and Tianjin Railway Signal Co., Ltd., both subsidiaries of CRSC Xi'an Industry Group Co., Ltd. In addition, the light storage and charging photovoltaic project of CRSC Railway Vehicles Co., Ltd. was completed. The total installed capacity of these photovoltaic projects was 7.9 MWP, supplying 4,353.30 MWh of clean electricity annually to the enterprises. This resulted in a savings of 549.2 tons of coal equivalent (TCE) per year and a reduction of 2,482.36 tons of carbon dioxide emissions.



积极采用绿色能源。工业制造类企业积极引入绿电清洁能源 928 万千瓦时，从源头减少二氧化碳的排放。

Actively adopted green energy. Industrial manufacturing subsidiaries actively introduced 9,280 MWh of green electricity and clean energy to reduce carbon dioxide emissions at the source.

加强节能环保信息化建设 Devoting more efforts to promoting the IT-based transformation of energy conservation and environmental protection



建设示范性能源智能化管控平台，提高节能环保的信息化管控水平。

Developed a demonstrative energy-intelligent control platform to enhance IT-based energy conservation and environmental protection management.



研究设计院集团北信公司已启动建设智慧能碳平台的构建，可达成对全部能源数据的自动化全面采集以及智能评估。预计 2025 年建成并投入使用。

Beijing Railway Signal Co., Ltd., a subsidiary of CRSC Research & Design Institute Group Co., Ltd., launched a smart energy carbon platform project. This project aims to automate the comprehensive collection and intelligent evaluation of all energy data. Its completion and operation are expected by 2025.



西安工业集团西信公司搭建电力分户计量系统，利用智能化管理手段，实现电能实时在线监测，合理管控电能资源。

Xi'an Railway Signal Co., Ltd., a subsidiary of CRSC Xi'an Industry Group Co., Ltd., developed a household electricity metering system that uses intelligent management methods to enable real-time online monitoring of electricity consumption and efficient control of electricity resources.

加快淘汰“双高”设备设施 Accelerating the phase-out of "double-high" (high pollution and high energy consumption) equipment and facilities



西安工业集团津信公司完成全部 47 台高耗能电机更换，预计每年可节约用电 2.5 万千瓦时。
Tianjin Railway Signal Co., Ltd., a subsidiary of CRSC Xi'an Industry Group Co., Ltd., completed the replacement of all 47 high-energy consumption motors. This is expected to save 25 MWh of electricity annually.



电缆集团天缆公司更换空压机站 1# 螺杆式空气压缩机油气分离器及管道过滤器，每月耗电量下降 1.1 万千瓦时；在厂区内更换 49 套太阳能路灯，每年可节约用电约 1.5 万千瓦时。
Tianshui Railway Cables Co., Ltd., a subsidiary of CRSC Cables Group Co., Ltd., replaced the oil and gas separator and pipeline filter of the No. 1 screw air compressor in the air compressor station. This resulted in a monthly reduction of 11 MWh in power consumption. In addition, it installed 49 sets of solar street lights within the factory area, replacing the old street lights and saving approximately 15 MWh of electricity annually.

加强绿色低碳基础设施建设 Strengthening the construction of green and low-carbon infrastructures



工程施工企业积极推行绿色建造工艺和绿色低碳建材，推动建材减量化、循环化利用，推进超低能耗、低碳建筑规模化发展。发挥装配式建筑和 BIM 技术在资源节约方面的优势，不断提升建造手段信息化水平和建造方式工业化水平。积极推广绿色新技术和可再生能源的应用，强化精益化施工组织方式，构建绿色低碳循环发展型企业。

Construction undertaking subsidiaries actively promoted green construction technologies and green, low-carbon building materials. They also encouraged the reduction and recycling of building materials. In addition, they supported the large-scale development of ultra-low energy consumption and low-carbon buildings. They utilized the advantages of prefabricated components and BIM technology for resource conservation and continuously improved the IT-based level of construction methods. Moreover, they actively promoted the application of new green technologies and renewable energy while strengthening lean construction organization methods to build green, low-carbon, and circular development enterprises.



通号电化局科创大厦建设项目被郑州市授予“扬尘治理标准化工地”“河南省智慧工地”称号。项目建造阶段预计碳排放 2,441.10 吨，较建造方式优化前降低 21.54%，运行阶段较项目优化前降低 18.63%。
The Kechuang Building Project by CRSC Zhengzhou Electrification Bureau Co., Ltd. was recognized as a "Standardized Dust Control Site" and a "Smart Construction Site in Henan Province" by Zhengzhou City. The estimated carbon emissions during the project's construction phase are 2,441.10 tons, reflecting a 21.54% reduction following the optimization of construction methods. Additionally, carbon emissions during the operation phase are expected to decrease by 18.63% after optimization.

加快智能化实验室建设 Accelerating the construction of intelligent laboratories



卡斯柯加大研发云网互联互通实验室项目建设推进力度，减少对实物和专用硬件平台的依赖，最大效率提高试验环境的综合效能、降低能耗。
CASCO intensified its efforts to promote the development of the cloud network interconnection laboratory project in order to reduce reliance on physical and dedicated hardware platforms, maximize the overall efficiency of the testing environment, and lower energy consumption.



城交公司实验室智能化管理系统完成功能升级并投入使用，进一步降低设备空转能耗，结合智能化网关，有效实现了实验室设备智能化、数字化、集中化管理。
The laboratory intelligent management system of CRSC Urban Rail Transit Technology Co., Ltd. was successfully upgraded and put into operation, further reducing idle energy consumption of equipment. By integrating intelligent gateways, it effectively enables intelligent, digital, and centralized management of laboratory equipment.

推动绿色轨道交通建设 Promoting the development of green rail transit



发挥技术创新优势，持续推动轨道交通行业高端化、智能化、绿色化发展，在降低运行成本、降低运行能耗的同时，最大限度提高设备工作效率。
CRSC leverages its technological innovation advantages to continuously promote the high-end, intelligent, and sustainable development of the rail transit industry, maximizing equipment efficiency while reducing operating costs and energy consumption.

指标 Indicator	单位 Unit	2022	2023	2024
电力消耗 Electric power consumption	兆瓦时 MWh	84,040.2	78,035	69,120.9
汽油消耗 Gasoline consumption	吨 Ton	4,267.5	3,602.6	3,034.84
柴油消耗 Diesel consumption	吨 Ton	2,620.3	1,644.7	902.227
热力消耗 Heat consumption	百万千焦 GJ	47,964.4	56,821.3	37,002.5
天然气消耗 Natural gas consumption	立方米 Square meter	2,082,460	2,094,311	2,056,058
综合能源消耗量 Aggregate energy consumption	吨标煤 TCE	24,830	22,024	18,307
万元产值综合能源消耗量 Aggregate energy consumption per CNY 10,000 output value	吨标煤 / 万元 TCE/CNY 10,000	0.011	0.01	0.01

水资源管理
Water resource
management

制定科学的水资源利用方案，开展节水改造、废水回收等项目，提高用水效率。公司工程项目主要用水为市政用水，各工程建设企业采取施工用水、生活用水管控措施。加强对施工现场用水的管理，杜绝了跑、冒、滴、漏等浪费现象。在施工现场设置雨水收集点、循环用水装置，用于施工现场的降尘、车辆冲洗、混凝土养护等环节，减少对市政供水的依赖。

CRSC developed scientific water resource utilization plans and implemented water-saving renovations, wastewater recycling, and other programs to improve water use efficiency. The company's projects primarily relied on municipal water supplies. Each construction enterprise adopted measures to control both construction and domestic water consumption. The company enhanced the management of water use on construction sites, eliminating overflow, spillage, leakage, and other forms of waste. To reduce dependence on the municipal water supply, it set up rainwater collection points and water recycling devices at construction sites for dust reduction, vehicle washing, concrete curing, and other processes.

指标 Indicator	单位 Unit	2022	2023	2024
用水量 Water consumption	吨 Ton	887,390	886,154	803,481
万元产值用水量 Water consumption per CNY 10,000 of output value	吨 / 万元 Ton/CNY 10,000	0.22	0.22	0.25

绿色物流
Green logistics

推行绿色流通，推广应用可循环使用的物流包装，开发应用新技术、新设备和新设施，优化物流组织模式，建立绿色物流体系。开展绿色回收，加强废弃物处置管理和再生资源回收利用，推广使用“宜企拍”平台进行处置。通号“宜企拍”上线运行以来，已有 22 家内部企业或机构注册账号，累计发布 562 个废旧物资竞拍项目，成交 238 个项目。

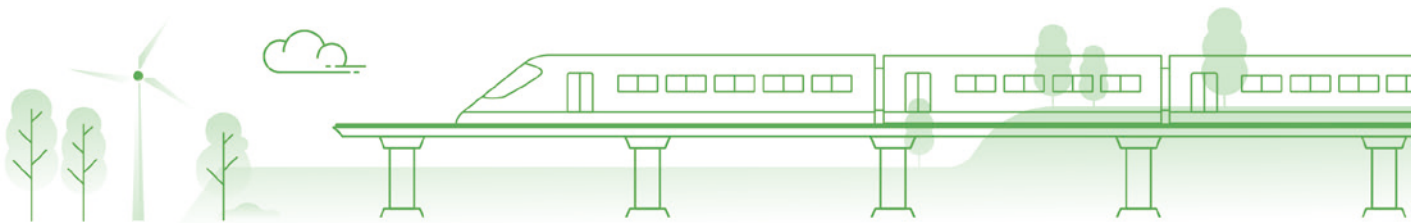
CRSC promoted green circulation and emphasized the use of reusable packaging for logistics. It also developed and applied new technologies, equipment, and facilities while optimizing logistics organization models and establishing a green logistics system. In addition, it implemented green recycling, strengthened waste disposal management, and supported the recycling of renewable resources. Moreover, it promoted the use of the "Yiqipai" platform (yqp-crrc.com) for waste disposal. Since its launch by CRSC, the "Yiqipai" platform has registered 22 subordinate enterprises or units and published a total of 562 bidding items for the disposal of waste materials, with deals successfully closed.

指标 Indicator	单位 Unit	2022	2023	2024
生成制造纸箱包装消耗量 Consumption of carton packages in production/manufacture	吨 Ton	298.9	364.12	451.4
生成制造木材包装消耗量 Consumption of wooden packages in production/manufacture	吨 Ton	2,444.9	2,485.83	2,737.09
生成制造塑料包装消耗量 Consumption of plastic packages in production/manufacture	吨 Ton	16.8	36.89	99.23
建筑工程包装消耗总量 Total consumption of packages in construction projects	吨 Ton	491.3	439.4	7.11
包装材料消耗总量 Total consumption of packaging materials	吨 Ton	3,251.9	3,326.24	3,294.93
万元营收包装消耗量 Consumption of packaging materials per CNY 10,000	吨 / 万元 Ton/CNY 10,000	0.0008	0.0009	0.0010

减少污染排放
Reducing pollutant emissions

公司严格遵守国家环保法规，通过优化生产工艺、引入先进环保技术、强化废弃物资源化利用等措施，有效减少生产运营过程中产生的废物排放。

CRSC adhered to national environmental laws and regulations. It effectively reduced waste emissions generated during production and operations by optimizing production processes, introducing advanced environmental protection technologies, and enhancing waste resource utilization.

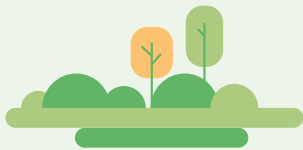


排放物种类 Types of emissions	处理措施 Treatment measures	
 废气 Waste gas	<p>委托有资质的第三方检测机构定期进行指标检测。</p> <p>Engaged qualified third-party testing institutions to conduct regular tests for confirming indicators.</p> <p>按照《挥发性有机物无组织排放控制标准》的要求，对生产过程中产生的挥发有机物加强治理。</p> <p>Strengthened the management of volatile organic compounds generated during production processes, in compliance with the Standards for Unorganized Emission Control of Volatile Organic Compounds.</p>	<p>各工程施工企业加强对现场扬尘的管控，按要求配备雾炮机、喷雾桩、喷淋系统、车辆洗车机、扬尘监测仪等设备，确保施工现场扬尘排放达标。</p> <p>All construction undertaking subsidiaries enhanced their control over fugitive dust at the construction sites. They equipped the sites with fog monitors, spray piles, spray systems, vehicle washing stations, fugitive dust monitors, and other necessary equipment to ensure that fugitive dust emissions meet the applicable standards.</p> <p>加强运输车辆管理，改造升级环保门禁系统，有效对汽车尾气进行管控。</p> <p>Enhanced truck management, upgraded environmental access control systems, and effectively controlled vehicle exhaust emissions.</p> <p>推动低挥发性原辅料替代高挥发性原辅料在生产中的应用。</p> <p>Promoted the use of low-volatility raw materials to replace high-volatility raw materials in production.</p>
 废水 Wastewater	<p>雨污分流，严格管控生产及生活废水排放。</p> <p>Separated rainwater from sewage and strictly controlled the discharge of production and domestic wastewater.</p> <p>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。</p> <p>Increased recycling efforts, installed sewage treatment systems, and ensured centralized treatment and discharge of wastewater in compliance with applicable standards. Conducted self-monitoring and third-party sampling of water quality pollutants.</p>	<p>公司总部、研究设计院集团北信公司对食堂隔油池予以改造升级，有效解决食堂排放污水含油量大的问题。</p> <p>The company's headquarters, in collaboration with Beijing Railway Signal Co., Ltd., a subsidiary of CRSC Research & Design Institute Group, renovated and upgraded the oil separation tanks of the canteens, effectively addressing the issue of high oil content in wastewater discharged from the canteens.</p> 
 废弃物 Solid waste	<p>实现一般工业固废分类收集、及时转移、合规处置。在施工现场推行修建建筑垃圾回收池，对部分建筑垃圾进行分类回收利用。</p> <p>Managed the classification, collection, timely transfer, and compliant disposal of general industrial solid waste. Promoted the establishment of solid waste recycling pools at construction sites to classify and recycle certain construction waste.</p> <p>分区存放，由有资质的第三方妥善处理危险废弃物。</p> <p>Stored hazardous waste in designated areas and appointed qualified third parties for proper disposal.</p>	<p>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。</p> <p>Regularly collected and disposed of general solid waste, such as office waste, construction waste, and packaging materials, in accordance with applicable standards.</p> <p>开展全员宣传教育，推行垃圾分类。</p> <p>Conducted employee education programs to promote waste sorting.</p>

指标 Indicator	单位 Unit	2022	2023	2024
二氧化硫排放量 Sulfur dioxide emissions	吨 Ton	0.022	0.0237	0.0249
化学需氧量排放量 Chemical Oxygen Demand (COD) emissions	吨 Ton	7.71	7.73	7.58
氨氮排放量 Ammonia nitrogen emissions	吨 Ton	0.649	0.672	0.671
氮氧化物排放量 NOx emissions	吨 Ton	0.749	0.727	0.727
生产制造环节一般废弃物排放量 General waste discharge in production and manufacturing processes	吨 Ton	1,518.3	1,807.05	1,839
建筑垃圾排放量 Discharge of construction waste	吨 Ton	17,542.0	16,147.92	5,745
无害废弃物排放总量 ※ Total discharge of harmless waste *	吨 Ton	19,060.3	17,954.97	7,584
万元营收无害废弃物排放量 Discharge of harmless waste per CNY 10,000 of revenue	吨 / 万元 Ton/CNY 10,000	0.0047	0.0048	0.0023
危险化学用品废弃物产生量 Hazardous chemical waste generated	吨 Ton	123.625	147.09	132.79
万元营收危险化学用品废弃物产生量 Hazardous chemical waste generated CNY 10,000 of revenue	吨 / 万元 Ton/CNY 10,000	0.00003	0.00004	0.00004

注 ※：公司的无害废弃物主要包括生产制造环节产生的木材、塑料、金属、纸箱等废弃物，以及工程建设环节产生的建筑垃圾。2024 年，公司工程板块积极落实集团关于市政房建业务转型升级战略要求，对与集团主业关联度不高的高风险市政房建业务进行压减，建筑垃圾产生量大幅减少。

Notes*: The company's non-hazardous waste mainly consists of wood, plastic, metal, and cardboard boxes generated during the production and manufacturing processes, as well as construction waste produced during construction activities. In 2024, the company's Construction Business Sector actively implemented the group's guidelines for transforming and upgrading the municipal housing construction business by reducing high-risk municipal housing construction business unrelated to the group's core business. This led to a significant reduction in the amount of construction waste generated.



践行生态保护 Implementing Ecological Protection in Practice

中国通号落实《中央企业长江黄河流域生态环境保护专项整治行动方案》和《中央企业长江黄河流域生态环境保护专项整治行动要点》要求，加大对位于长江、黄河流域所属企业（项目部）及建设项目的管控、整治和监督检查力度，切实维护长江、黄河流域环境安全，坚决守牢生态安全底线。

CRSC implemented the requirements of the Action Plan for the Special Rectification Tasks of Central SOEs against Issues in Ecological Environment Protection in the Yangtze River and Yellow River Basins and the Key Points for the Special Rectification Tasks of Central SOEs against Issues in Ecological Environment Protection in the Yangtze River and Yellow River Basins. It also enhanced control, rectification, supervision, and inspection of its subsidiaries' project departments and construction projects located in the Yangtze River and Yellow River basins to effectively ensure the environmental safety of the Yangtze River and Yellow River basins and firmly uphold the bottom line of ecological safety.



卡斯柯开展“守护蓝色星球”西安联合净滩活动，携手西安铁路局集团等 70 名志愿者捡拾垃圾 116.43 公斤，为黄河支流水域塑料污染的治理做出积极贡献

CASCO organized a "Protect the Blue Planet" joint beach cleaning activity in Xi'an for its employees. It partnered with 70 volunteers from the China Railway Xi'an Bureau Group. Together, they collected 116.43 kg of garbage, making a positive contribution to combating plastic pollution along the tributary waterways of the Yellow River.

回应的 SDGs
SDGs



海纳英才 打造幸福职场

Creating a Happy Workplace to
Attract Talents Globally

保障员工权益

Protecting Rights and Interests of Employees

助力员工成长

Supporting Employees in Their Personal Development

关心员工生活

Caring about Employees

展现劳模风采

Showing Charisma of Model Workers

04

保障员工权益

Protecting Rights and Interests of Employees

中国通号将人才视为企业发展的核心力量，全面保障员工权益，致力于打造成长畅通、充满关爱的幸福职场，激发员工潜能与活力，推动企业与员工同频共振，共创美好未来。

CRSC considers talent the core force of corporate development. It fully safeguards employees' rights and interests and is committed to creating a happy and caring workplace that fosters growth. The aim is to stimulate employees' potential and vitality, promote resonance between enterprises and employees, and co-create a better future.

中国通号员工构成情况
CRSC's Workforce Composition

指标		单位	2022	2023	2024
Indicator		Unit			
按层级划分 By job level	高级管理人员 Number of top-level managers	人 Person	218	302	268
	中层管理人员 Number of middle-level managers	人 Person	1,001	1,098	1,126
	普通员工 Number of non-management employees	人 Person	18,790	18,025	17,838
	男 Number of male employees	人 Person	15,068	14,566	14,401
	女 Number of female employees	人 Person	4,941	4,859	4,831
按性别划分 By sex	中国大陆 Number of employees from Mainland China	人 Person	19,912	19,340	19,152
	港澳台 Number of employees from Hong Kong, Macao and Taiwan	人 Person	1	1	1
	国外 Number of employees from foreign countries	人 Person	96	84	79
按地区划分 By nationality	员工总数 Total number of employees	人 Person	20,009	19,425	19,232
	劳动合同员工 Number of regular employees with labor contracts signed with the company	人 Person	20,009	19,425	19,232
	劳务协议员工 Number of independent contractors with service contracts signed with the company	人 Person	41	49	42
	第三方派遣员工 (含劳务派遣和股东方派驻) Number of employees dispatched by third-party labor providers and shareholders to the CompanyNOx emissions	人 Person	940	1,191	1,140
按员工类型划分 By employment contract	≥ 51 岁 Number of employees aged ≥ 51	人 Person	2,546	2,324	2,409
	31-50 岁 Number of employees aged 31-50	人 Person	12,033	12,177	12,734
	≤ 30 岁 Number of employees aged ≤30	人 Person	5,430	4,924	4,089
按年龄结构划分 By age					

指标		单位	2022	2023	2024
Indicator		Unit			
按层级划分 By job level	高级管理人员 Number of top-level managers	人 Person	218	302	268
	中层管理人员 Number of middle-level managers	人 Person	1,001	1,098	1,126
	普通员工 Number of non-management employees	人 Person	18,790	18,025	17,838
按性别划分 By sex	男 Number of male employees	人 Person	15,068	14,566	14,401
	女 Number of female employees	人 Person	4,941	4,859	4,831
按地区划分 By nationality	中国大陆 Number of employees from Mainland China	人 Person	19,912	19,340	19,152
	港澳台 Number of employees from Hong Kong, Macao and Taiwan	人 Person	1	1	1
	国外 Number of employees from foreign countries	人 Person	96	84	79

平等雇佣

Employment equity

公司明确招聘政策和程序，建立公正的招聘与评估机制，根据《中华人民共和国劳动法》《中华人民共和国劳动合同法》等有关法律法规，制定《劳动合同管理暂行办法》和《关于加强全面推行用工市场化的指导意见》，在合法、公平、平等自愿、协商一致、诚实信用的基础上签订、履行劳动合同，依法签订劳务派遣协议，保障员工及灵活就业人员合法权益。报告期内，中国通号劳动合同签订率为 100%。

CRSC has established clear recruitment policies and procedures, along with fair recruitment and evaluation mechanisms. It has also formulated the Interim Measures for the Administration of Labor Contracts and the Guiding Opinions on Strengthening the Comprehensive Promotion of Market-Oriented Employment in accordance with all applicable laws and regulations, such as the Labor Law of the People's Republic of China and the Labor Contract Law of the People's Republic of China. The company ensures that all employees sign labor contracts based on legality, fairness, equality, voluntariness and good faith after friendly negotiation. Additionally, CRSC signs labor dispatch agreements in accordance with the law to protect the legitimate rights and interests of employees and independent contractors. During the reporting period, CRSC achieved a 100% labor contract signing rate with its employees.

公司确保员工正常休息、休假，改善一线职工的休息环境，天气恶劣的情况下调整作息时

间，做好防暑降温、防寒等工作。在女员工经期、孕期、产期、哺乳期间，不安排其从事国家规定的禁忌劳动。

CRSC ensured that all employees received proper rest and vacation, improved the resting conditions for frontline workers, adjusted work and rest schedules in adverse weather conditions, implemented adequate measures to prevent heatstroke and cold, complied with national laws and regulations by refraining from assigning female employees to prohibited tasks during their menstruation, pregnancy, childbirth and lactation.

中国通号吸纳灵活就业情况
Jobs Offered by CRSC for Independent Contractors (Freelancers)

指标 Indicator	单位 Unit	2024
员工总数 Total number of employees	人 Person	19,232
吸纳就业人数 Number of new employees recruited in the year	人 Person	1,063
灵活就业岗位 Number of jobs offered for independent contractors	人 Person	266
灵活就业岗位占比 Proportion of jobs for independent contractors	%	1.38

多元化和机会平等
Diversity and equal opportunities

公司坚持多元化和平等的雇佣政策，在招聘、用工和管理等环节，杜绝雇佣童工，也不支持其他公司或社会团体雇佣童工的行为，杜绝一切性别、民族、宗教、年龄等歧视现象，雇佣的所有员工都符合中国法律法规所规定的年龄要求，尊重和保护员工各项合法权益，积极构建和谐劳动关系。

CRSC upholds a diverse and equitable employment policy, strictly prohibiting child labor in recruitment, employment and management processes. The company does not support the employment of child labor by other companies or social organizations. It is committed to eliminating all forms of discrimination based on gender, ethnicity, religion, age, etc. CRSC ensures that all employees meet the legal age requirements set by applicable Chinese laws and regulations, respects and protects their legitimate rights and interests, and actively fosters harmonious labor relations.

薪酬福利
Compensation and benefits

公司坚持同工同酬的原则，建立科学合理、具有竞争力的薪酬分配体系。持续推进薪酬制度改革，修订《总部员工薪酬管理办法》，建立以岗位价值为基础、以绩效贡献为依据的总部薪酬管理体系，注重平时考核与年度考核相结合，推动员工对标先进，持续改进绩效。修订《工资总额管理办法》，主动识别核心关键人才，分层分类对标市场化薪酬。

CRSC upholds the principle of equal pay for equal work and has established a scientific, reasonable and competitive salary/compensation plan. The company continuously promotes salary system reforms, revises the Rules for Managing Employee

Salary at Headquarters, and implements a headquarters salary management system based on job value and performance contribution. Emphasizing a combination of regular and annual assessments, CRSC encourages employees to continuously improve their performance by benchmarking. Additionally, the company has amended the Payroll Management Rules to proactively identify core and key talents while aligning market-oriented salary plans in a structured and classified manner.

制定《津贴补贴和福利管理暂行规定》，规范津贴补贴和福利管理，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。此外，按照国家、地区及企业内部政策为职工卫生保健、生活等发放或支付各项补贴和福利，包括独生子女费、防暑降温费、女工卫生费、体检费等，为员工提供丰富多样的福利保障。2024 年，公司社会保险覆盖率 100%，人均带薪年假 8 天。

CRSC formulated the Interim Regulations on Allowances and Benefits to standardize the management of allowances and benefits. The company ensures the timely and full payment of social insurance premiums, supplementary pension insurance premiums, supplementary medical insurance premiums and housing provident funds for all employees. Additionally, in accordance with national, local, and internal company policies, CRSC provides various allowances and benefits to employees, including one-child family allowance, hot & cold weather allowances, female worker hygiene allowances, physical examination expenses, etc., offering employees comprehensive and diverse benefits. In 2024, the company achieved 100% social insurance coverage, with employees receiving an average of 8 days of paid annual leave.

2024 年，公司社会保险覆盖率

100%

In 2024, the company achieved 100% social insurance coverage

人均带薪年假

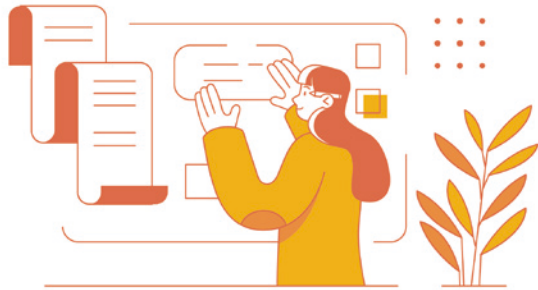
8天

Employees receiving an average of 8 days of paid annual leave

民主管理
Democratic management

公司积极推进民主管理，加强民主沟通。通过建立和完善以职工代表大会为核心的企业民主管理制度，实行厂务公开，全面推行民主管理模式。同时，依法设立职工董事和职工监事制度，保障职工能够参与企业的决策和监督。着力构建和谐稳定的劳动关系，推动集体协商制度的完善。在平等协商的基础上，签订《集体合同》和《工资专项协议》，切实保障职工的知情权、参与权、表达权和监督权等民主权利，促进企业内部的和谐与共赢。

CRSC actively promotes democratic management and strengthens democratic communication. The company advances the democratic management model in all aspects by establishing and improving the internal democratic management system centered on the workers' congress, and implementing transparency in workplace affairs. Additionally, CRSC has established a set of rules for employee directors and supervisors in accordance with the law to ensure employees participation in enterprise decision-making and supervision. The company focuses on fostering harmonious and stable labor relations while enhancing the collective bargaining system. It has signed the Collective Agreement and the Special Wage Agreement through equal consultation, effectively safeguarding employees' democratic rights, such as the rights to information, participation, expression and supervision, while promoting harmony and mutual benefit within the enterprise.



助力员工成长

Supporting Employees in Their Personal Development

中国通号重视员工成长，建立明确的职业晋升机制，并通过系统化培训和劳动竞赛等方式，提升员工的技能与综合素质，增强员工的职业安全感，建立高质量的人才梯队。

CRSC places great importance on employee growth and has established a clear career promotion mechanism. The company systematically organizes training and work competition activities to enhance employees skills and comprehensive qualities, strengthen their sense of occupational security, and build a high-quality talent pool.

畅通发展通道

Removing obstacles in career paths

公司系统规划员工职业发展，建立明确的晋升机制与标准，持续引导员工不断进步，增强员工的职业安全感和忠诚度，为企业的可持续发展注入活力和动能。

CRSC has systematically planned for supporting the career development of employees, establishing clear promotion mechanisms and standards. The company continuously guides employees to progress, enhancing their sense of occupational security and loyalty, and adding vitality and momentum to the sustainable development of the enterprise.

制定发布《高技能人才培养实施方案》，明确技能人才培养方式，设立技能提升补贴、高技能人才岗位补贴等，树立“技高者多得、多劳者多得、贡献者多得”的导向，吸引更多高潜质人才向技能人才方向发展。对为技能人才培养做出突出贡献的人员进行奖励、表彰，建立促进高技能人才成长的氛围，努力培养造就更多高技能人才、大国工匠。

The company formulated and released the High-Skilled Talent Cultivation Plan, which outlines the training methods for skilled talents. It established skill enhancement subsidies and allowances for high skilled talent positions, and adopted the guiding principle of "more pay for higher skills, more pay for more achievements, and more pay for more contributions" to attract more high potential talents to develop towards skilled talents. The company also rewards and commends individuals who have made outstanding contributions to the cultivation of skilled talents, fostering an environment that promotes the growth of high-skilled talents. It strives to nurture more high skilled talents essential and skilled craftsmen for building China into a super power.

树立“技高者多得、多劳者多得、贡献者多得”的导向，吸引更多高潜质人才向技能人才方向发展。

Adopted the guiding principle of "more pay for higher skills, more pay for more achievements, and more pay for more contributions" to attract more high potential talents to develop towards skilled talents.

实施员工培训

Offering training for employees

公司高度重视员工能力提升，制定《培训管理办法》，紧密围绕企业改革发展需要，以提升人才队伍素质能力为根本，以打造适应性人才队伍为重点，不断提高教育培训的针对性和实效性。

CRSC attaches great importance to improving the abilities and skills of its employees. The company formulated the Training Management Rules and continuously improves the relevance and effectiveness of its education and training programs. These efforts are centered on the needs of corporate reform and development, with the primary objective of enhancing the quality and abilities of the talent pool, and focusing on building an adaptive talent team.

制定《全覆盖培训实施方案》，加大领导人员教育培训力度，有效提升领导干部政治素质和业务本领。完善企业领导人员考核评价体系，修订《领导班子和领导人员综合考核评价办法》并推行实施。

CRSC formulated the Full-Coverage Training Implementation Plan to intensify the efforts in offering education and training to leaders and cadres, effectively improving their political accomplishment and professional skills. The company also improved the assessment and evaluation system for leaders by revising and implementing the Comprehensive Assessment and Evaluation Method for Leading Group and Leaders.

加强产业工人队伍建设，健全产业工人终身职业技能培训制度。开发制定《技能人才培训课程体系（第一版）》，构建起包括技能人才制度体系，讲师队伍和各企业技能人才培训基地等全集团统一的技能人才培养体系。围绕年度重点工作开展领导干部“党的二十届三中全会精神解读”培训、中国通号优秀年轻干部和年轻专业人才培养“启航计划”、科技创新培训、财务培训、安全生产培训等相关培训计划。

Furthermore, CRSC strengthened the development of the industrial workforce and improved the lifelong vocational skills training system for industrial workers. The company developed and formulated the Skilled Talent Training Curriculum System (First Edition), establishing a unified skilled talent training system for the entire group, which includes a skilled talent system, a lecturer team and skilled talent training bases. CRSC also created several training plans based on the company's annual key tasks, including "Interpretation of the Spirit of the Third Plenary Session of the 20th Central Committee of the Communist Party of China", the "Sailing Program" for outstanding young cadres and young professionals, as well as training plans for scientific and technological innovation, finance and work safety.



中国通号班组长综合能力提升培训班
CRSC Team Leader Comprehensive Ability Enhancement Training Course

中国通号员工培训情况

CRSC's Employees Training

指标		单位	2022	2023	2024
Indicator		Unit			
员工培训人数		人	-	-	18,491
Number of employees trained		Person			
员工培训支出金额		万元	-	-	2,081.35
Expenditure for employees training		CNY 10,000			
按雇员层级划分 员工人均 培训时长	高级管理人员人均培训时长	小时	63.613	118.99	115.21
	Average training hours per top-level manager	hour			
	中层管理人员人均培训时长	小时	52.133	104.06	112.40
Average training duration per employee, by job level	Average training hours per middle-level manager	hour			
	普通员工人均培训时长	小时	29.513	42.05	48.96
Average training hours per non-management employee	Average training hours per non-management employee	hour			
按性别划分员工 人均培训时长	男性员工人均培训时长	小时	213.42	55.813	64.02
	Average training hours per male employee	hour			
Average training duration per employee, by sex	女性员工人均培训时长	小时	23.29	36.3	46.81
	Average training hours per female employee	hour			
按雇员层级划分的 员工培训人数	高级管理人员参加培训人数	人	-	-	264
	Number of top-level managers trained	Person			
	中层管理人员参加培训人数	人	-	-	1,116
Number of employees trained, by job level	Number of middle-level managers trained	Person			
	基层员工参加培训人数	人	-	-	17,111
Number of non-management employees trained	Number of non-management employees trained	Person			
按性别划分的员 工培训人数	男性员工培训人数	人	-	-	13,821
	Number of male employees trained	Person			
Number of employees trained, by sex	女性员工培训人数	人	-	-	4,670
	Number of female employees trained	Person			

组织劳动竞赛

Organizing work competitions

公司深入推进以“比、学、赶、帮、超”为核心的劳动竞赛活动，积极营造劳动光荣、技能为本的良好氛围。在重大工程建设、生产安全、重点科技攻关、提质增能创效、技术创新等方面，以“勇担当、做贡献、保增长”为主题开展劳动竞赛，激发企业高质量发展驱动力。

CRSC has actively promoted work competition activities centered around the themes of "comparing, learning, catching up, helping and surpassing", fostering a good enthusiasm and skill based working atmosphere. In areas of major project construction, workplace safety, key scientific and technological breakthroughs, quality and efficiency improvement, and technological innovation, the company organized work competitions under the theme of "taking responsibilities, making contributions and ensuring growth" to drive high-quality corporate development.

报告期内，公司被授予“全国工人先锋号”1个；“轨道上的京津冀”职工劳动竞赛先进个人2人，先进集体1个；2022—2023年度全国“安康杯”竞赛活动先进集体1个；中央企业劳动模范1人，中央企业先进集体1个；火车头奖章2个，奖杯1个；职工先进工艺工法2项，职工教育工案例1项。组织一线职工参加铁总“红旗杯”班组长大赛初赛，其中3名选手进入铁路赛道复赛，分别获得一等奖和最佳风采奖。

During the reporting period, the company received numerous work-related awards and honors, including: one "National Pioneer Unit"; two exemplary individuals and one exemplary collective in the "Beijing-Tianjin-Hebei on the Track" Work Competition; one exemplary collective in the 2022-2023 National "Ankang Cup" Competition; one model worker of the Central SOEs and one exemplary collective of the Central SOEs;two workers won the honor of"Locomotive Medal",one team won the honor of"Locomotive Trophy";two worker awards for advanced techniques and methods; and one case of employee education work. CRSC also organized frontline employees to participate in the preliminary round of the "Red Flag Cup" Team Leader Competition organized by China Railway. Three contestants advanced to the railway track semi-finals and won the First Prize and the Best Performance Award, respectively.

报告期内，公司被授予

“全国工人先锋号”1个

“轨道上的京津冀”
职工劳动竞赛先进个人2人

先进集体1个

During the reporting period, the company received numerous work-related awards aPioneer Unit"; two exemplary individuals and one exemplary collective in the "Beijing-Tianjin-Hebei on the Track" Work Competition



2024年11月，中国通号团队在首届“ESAMBER 屹博杯”全国电子制造行业技能大赛中荣获3个“团队优秀奖”和“最佳操作规范奖”

In November 2024, CRSC team won three "Team Excellence" awards and the "Best Standard Operation Procedures" award in the first "ESAMBER Cup" National Electronic Manufacturing Industry Skills Competition

关心关爱员工 Caring about Employees

中国通号始终关注员工的职业健康、心理关怀和生活品质，努力为员工打造健康舒适的工作环境和积极向上的企业文化氛围。通过多方面的关怀和支持，不断增强员工的幸福感与凝聚力，构建和谐共进的工作关系。

CRSC has always placed great importance on the occupational health, psychological health and quality of life of its employees. The company strives to create a healthy and comfortable working environment and an inspiring corporate culture for employees. It continuously enhances employees' senses of happiness and cohesion, fostering a harmonious working relationship by providing care and support from all aspects.

守护职业健康 Protecting occupational health

公司严格遵守《中华人民共和国职业病防治法》等法律法规，倡导健康的生产、生活方式，通过改善工作环境、举办职业健康宣教活动等方式，为员工营造健康、舒适的工作环境。

CRSC strictly complies with the Occupational Disease Prevention and Control Law of the People's Republic of China and other relevant laws and regulations. The company promotes healthy production and lifestyle and fosters a healthy, comfortable working environment for employees by improving workplace conditions and organizing occupational health education activities.

报告期内，公司持续建立健全职业病预防管控机制，落实职业病防治责任，完善企业职业病防治管理档案。全年工伤保险投入 1,504.7 万元，工伤保险覆盖率 100%；共识别职业病危害因素作业场所 70 个，涉及职业危害作业人员 1,073 名；集中开展作业场所职业病危害因素检测工作，识别职业病危害作业岗位（作业点）219 个，检测合格 219 个，第三方检测合格率为 100%；持续开展职业病危害作业人员职业健康检查，未发现职业病和疑似职业病病例。

During the reporting period, CRSC continued to establish and improve its occupational disease prevention and control mechanisms, fulfilled occupational disease prevention and control responsibilities, and improved corporate occupational disease prevention and control management files. The company invested CNY 15.047 million in work-related injury insurance throughout the year, achieving a 100% coverage rate. A total of 70 workplaces with occupational hazards were identified, involving 1,073 exposed workers. The company uniformly carried out identification of occupational disease hazards in workplaces, and identified 219 risky job positions (job sites), 100% of which were confirmed as acceptable after inspection by the third-party institution. Furthermore, CRSC continued to conduct occupational health examinations for workers exposed to occupational hazards, with no cases of occupational diseases or suspected occupational diseases identified.

全年工伤保险投入
1,504.7 万元

工伤保险覆盖率
100%

The company invested CNY 15.047 million in work-related injury insurance throughout the year, achieving a 100% coverage rate

中国通号员工职业健康情况 Occupational Health Conditions of CRSC's Employees

指标 Indicator	单位 Unit	2022	2023	2024
职业健康体检完成率 Completion rate of occupational health examinations	%	100	100	100
新增职业病数 Number of newly added occupational diseases	例 Case	0	0	0

平衡工作与生活 Work-life balance

公司定期举办各类文化和体育活动，丰富员工的业余生活，增进团队之间的互动与合作，增强集体凝聚力。

The Company regularly held various cultural and sports activities to enrich employees' leisure time, promote team interaction and cooperation, and enhance collective cohesion.



“新春墨韵·挥毫送福”写春联送福活动

Special activity of sending blessings through Spring Festival couplets written by employees with their own hands



中国通号第三届“行健杯”男子篮球总决赛

The 3rd CRSC "Fitness Cup" Men's Basketball Finals



帮扶慰问员工

Providing assistance to employees in need

公司按照《中国通号工会关于做好职工职业生涯全过程关爱服务的实施方案》，围绕员工从入职到退休离岗等 10 个重要节点，制定细则，做好职工职业生涯全过程、全流程关心关爱服务。

The company has established detailed regulations centered around 10 critical stages of an employee's journey—from onboarding to retirement and departure—to provide systematic and end-to-end career-long care and support services, in accordance with the CRSC Trade Union's Scheme for Providing Care Services for Employees Throughout their Career.

在 2024 年元旦和春节期间开展送温暖活动，筹集送温暖资金 524.4 万元，慰问困难职工家庭 248 个，发放慰问物资 30 万元，慰问一线职工、劳模先进 11,103 人，一线班组 546 个，发放慰问物资共计 474.7 万元。开展夏季“送清凉”系列活动，组织各级工会领导带队奔赴各参建项目驻地，发放慰问资金 253.4 万元，共慰问工程项目 324 个，慰问一线班组 511 个，慰问人数达到 14,382 人次。

During the New Year's Day and Spring Festival in 2024, CRSC launched the "Delivering Warmth" initiative, raising CNY 5.244 million for this purpose. The company provided assistance to 248 families of workers in need, distributing relief materials worth CNY 300,000. Additionally, visits were made to 11,103 frontline and model workers, as well as 546 frontline teams, with a total of CNY 4.747 million worth of gifts provided. The company carries out a series of "Delivering Coolness" activities in summer, with trade union leaders at all levels leading teams to visit 511 frontline teams across 324 ongoing project sites. A total of CNY 2.534 million in cash was personally distributed to 14,382 frontline workers.

在 2024 年元旦和春节期间开展送温暖活动

筹集
送温暖资金 **524.4** 万元

慰问
困难职工家庭 **248** 个

During the New Year's Day and Spring Festival in 2024, CRSC launched the "Delivering Warmth" initiative, raising CNY 5.244 million for this purpose. The company provided assistance to 248 families of workers in need



春节期间慰问退休老专家

Visited retired experts during the Spring Festival



展现劳模风采

Showing Charisma of Model Workers

持续推进创新工作室工作，按照年度工作计划开展攻关、培训和师带徒工作，在持续破题工程应用技术难题、构建前瞻性科技成果储备，实现“产、学、研、用”统筹发展。

CRSC continued to promote the work of innovation studios, conducting research, training and mentorship activities in line with the annual work plan. The company consistently solved technical problems in engineering applications, proactively preparing for future scientific and technological advancements while ensuring the coordinated development of "production, learning, research and application".

报告期内，30 家劳模创新工作室共取得科研成果 65 项、取得专利技术 80 项，开展攻关活动 105 次，专项培训 108 次、受训人员 2,436 人次，外部交流 70 次，开展师带徒授课 143 次。

During the reporting period, 30 model worker innovation studios collectively achieved 65 scientific research breakthroughs, obtained 80 patented technologies, conducted 105 technological innovation initiatives, delivered 108 specialized training sessions for 2,436 participants, participated in 70 external exchange activities, and organized 143 mentorship-based lectures.

报告期内，30 家劳模创新工作室共

取得科研成果

65 项

取得专利技术

80 项

During the reporting period, 30 model worker innovation studios collectively achieved 65 scientific research breakthroughs, obtained 80 patented technologies



回应的 SDGs

SDGs

17 促進目標實現
的夥伴關係



深化合作 携手互利共赢

Joining Hands for Mutual Benefit
Through Intensive Cooperation

拓展战略合作

Expanding Strategic Cooperation

推动行业发展

Promoting Industry Development

建设责任供应链

Building a Responsible Supply Chain

共建“一带一路”

Jointly Building the Belt and Road



拓展战略合作 Expanding Strategic Cooperation

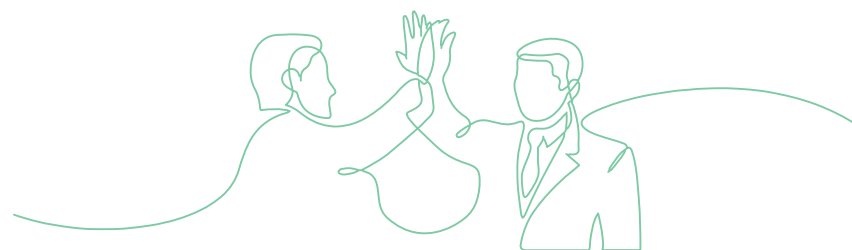
中国通号始终坚持“开放创新、合作共赢”的发展理念，与政府机构、企业以及高等院校开展多渠道、多领域、多层次深度合作，通过资源共享、优势互补，构建广泛深化的合作网络，打造互利共赢的合作格局。

CRSC upheld the development concept of "open innovation and win-win cooperation." It also engaged in multi-channel, multi-field, and multi-level deep collaborations with governments, enterprises, and universities. It used this approach to build an extensive and in-depth cooperation network, creating a mutually beneficial cooperation landscape through resource sharing and mutual complementarity.

政企合作 Government-enterprise cooperation

拓展深化与政府合作关系，接待工信部来访调研，与北京市、江苏省、河北省等地政府开展交流，与越南、尼日利亚联邦等国家和地区领导举行会谈，推动政企合作不断走深走实，更好带动地方经济发展。

CRSC expanded and strengthened its cooperation with governments and hosted visits and field research of the Ministry of Industry and Information Technology. It also conducted exchanges with governments in Beijing City, Jiangsu Province, Hebei Province, and other regions. In addition, CRSC held talks with leaders from Vietnam, Nigeria, and other countries and regions. These efforts aimed to promote the ongoing deepening and implementation of government-enterprise cooperation to enhance local economic development.



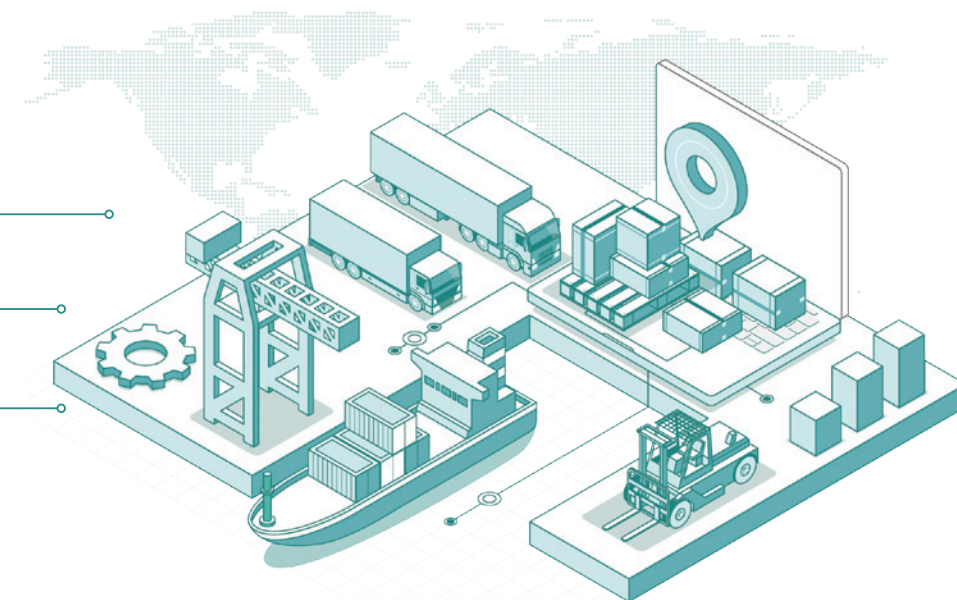
2024年10月，中国通号与雄安新区管委会签署战略合作协议
In October 2024, CRSC signed a strategic cooperation agreement with the Xiong'an New District Administration Committee

深度合作 deep collaborations

政府机构
governments

企业
enterprises

高等院校
universities



企企合作 Inter-enterprise cooperation

与中信集团、广铁集团、印尼 PT Len Railway Systems 等签署战略协议，与中国节能、巴西 COMPORTE 集团、阿联酋联邦铁路公司等企业开展合作交流，实现更高水平的互利共赢。

CRSC signed strategic agreements with CITIC Group, China Railway Guangzhou Bureau Group, and Indonesia's PT Len Railway Systems, among others. In addition, it has engaged in cooperation and exchanges with enterprises such as CECEP, Brazil's COMPORTE Group, UAE's Etihad Rail, etc., to achieve higher levels of mutual benefit and win-win results.



2024年11月，中国通号与中国中信集团签署战略合作协议
In November 2024, CRSC signed a strategic cooperation agreement with CITIC Group



校企合作

University-enterprise cooperation

与高校携手推动产学研融合发展，与中南大学、北京交通大学签订战略合作协议，推动科技创新发展的战略要求，促进高校科技人才、学科优势与中国通号的技术、资源、产业优势全面对接。

CRSC collaborated with universities to foster the integration of enterprises, universities, and research institutions. It signed strategic cooperation agreements with Central South University and Beijing Jiaotong University to address the scientific and technological innovation and development. In addition, CRSC promoted the comprehensive integration of universities' scientific and technological talent and disciplinary strengths with its own technological, resource, and industrial advantages.



卡斯柯荣获“2023 年中国产学研合作创新成果”一等奖，被授予“中国产学研合作创新示范企业”

CASCO won the first prize for the "2023 China Industry-University Research Cooperation Innovation Achievement" and was awarded the "China Industry University Research Cooperation Innovation Demonstration Enterprise" title



案例 · Case

中国通号牵头成立国家轨道交通安全控制行业产教融合共同体

CRSC took the lead in establishing an Industry-Education Community for the rail transit safety control industry of China

2024 年 9 月，国家轨道交通安全控制行业产教融合共同体（以下简称“共同体”）成立大会在中国通号成功召开。共同体面向全轨道交通领域，通过校企合作方式，促进教育链、人才链与产业链、创新链有机衔接，形成教育和产业统筹融合、良性互动的发展格局。

In September 2024, the Inauguration Conference of the Industry-Education Community for the Rail Transit Safety Control Industry of China (hereinafter referred to as the "community") was successfully held at CRSC. The community focuses on the entire rail transit sector and aims to promote the seamless integration among the education, talent, industry, and innovation chains through university-enterprise cooperation. It also seeks to create a development model characterized by coordinated integration and constructive interaction between education and industry.



国家轨道交通安全控制行业产教融合共同体成立仪式
Inauguration Ceremony of the Industry-Education Community for China's Rail Transit Safety Control Industry

推动行业发展

Promoting Industry Development

中国通号致力于构建和参与行业沟通与交流平台，担任北京低空经济产业发展联盟轮值副主席单位和秘书长单位、无锡低空飞行监管服务平台建运维合作联盟，举办全国铁道行业职业技能大赛，为行业的持续发展和进步贡献力量。

CRSC devoted itself to building and participating in industry communication and exchange platforms. It served as the Rotating Vice Chairman and Secretary-General of the Beijing Low-Altitude Economy Industry Development Alliance. It was also one of the initiators of the Wuxi Low-Altitude Flight Supervision Service Platform Construction, Operation, and Maintenance Cooperation Alliance. In addition, it hosted the National Railway Industry Vocational Skills Competition, making significant contributions to the sustainable development and progress of the industry.

持续参与国际国内标准化活动，参编《低空智能网联体系参考架构 (2024 版)》白皮书、《中国城市轨道交通中华城轨发展规划》；参与多项国家标准、团体标准的立项和制定工作；牵头承担国家铁路局《轨道交通互联互通技术规范基础工作》等 3 项课题研究，参与国家铁路局《北斗卫星导航系统铁路应用标准体系规划研究》等 2 项课题，参加《粤港澳大湾区轨道交通标准衔接贯通研究》专班工作，积极提出标准体系规划方案，助力中国轨道交通标准化、规范化发展。

CRSC continuously promoted both international and domestic standardization efforts. It also contributed to the preparation of the white paper Reference Architecture for Low-Altitude Intelligent Networking System (2024 Edition) and the China Urban Rail Transit Development Plan. In addition, it participated in the launch and formulation of multiple national and group standards. Moreover, CRSC led research on three projects, including the "Basic Work of Technical Specifications for Rail Transit Interconnection," commissioned by the National Railway Administration. Additionally, it participated in two projects, such as the "Planning and Research of Railway Application Standard System for the Beidou Satellite Navigation System," under the National Railway Administration. CRSC also contributed to the task force work for the "Research on Interconnection and Interoperability of Standards for Rail Transit in the Guangdong-Hong Kong-Macao Greater Bay Area." Furthermore, it actively proposed schemes for the planning of standard systems to support and drive the standardized development of China's rail transit industry.



中国通号主导的《IEC 61196-1-127:2024 同轴通信电缆第 1-127 部分：电气试验方法：辐射电缆链路损耗》开创国际渐变辐射型漏缆测试的全新方法

The preparation of IEC 61196-1-127:2024 "Coaxial Communication Cables - Part 1-127: Electrical Test Methods - Link Loss of Radiating Cable," led by CRSC, introduces a new method for testing gradient radiating leaky cables globally



中国通号参加 InnoTrans 国际轨道交通展览会

CRSC participated in the InnoTrans (International Trade Fair for Transport Technology)



中国通号亮相第七届中国国际进口博览会

CRSC appeared at the 7th China International Import Expo

建设责任供应链

Building a Responsible Supply Chain

中国通号持续强化供应链管理能力，将 ESG 相关要求纳入供应链管理体系中，助力产业链向可持续发展转型。

CRSC continued to enhance its supply chain management capabilities. It also incorporated ESG requirements into its supply chain management system to support the industry's transformation toward sustainable development.

强化供应链风险防范 Strengthening supply chain risk prevention



重视流程管控，保障数据安全，审慎甄别共享范围，杜绝信息安全事故发生。

Paid attention to process control, ensured data security, carefully defined the sharing scope, and prevented information security incidents.



加强招标采购、供应商选择、合同签订等关键环节控制，将合规风险管理嵌入供应链各环节和全流程，形成全面有效的供应链管控体系。

Strengthened control over key processes, such as procurement tendering, supplier selection, and contract signing. Embedded compliance risk management into all parts and components of the supply chain to form a comprehensive and effective supply chain control system.



切实防范廉洁风险，落实规范供应商“黑名单”管理工作的要求和标准，明确供应商违反廉政要求或职业道德等，将被纳入“黑名单”，对其提供的所有产品及服务禁止采购和使用。

Effectively mitigated corruption risks and implemented requirements to standardize the blacklist-based supplier management system. This clarified that suppliers who violate integrity requirements or professional ethics will be added to the blacklist, and their products or services shall be purchased, procured, or used.



对标学习先进企业数字化采购平台搭建经验，逐步完善“通购网”功能，做到业务公开、过程受控、全程在线、永久可追溯。

Gained insights from the digital procurement platforms of leading enterprises through benchmarking, gradually enhancing the functions of the CRSC e-Commerce Platform. This resulted in improved business transparency, process control, full online transactions, and permanent traceability.

保障供应链安全 Ensuring supply chain security



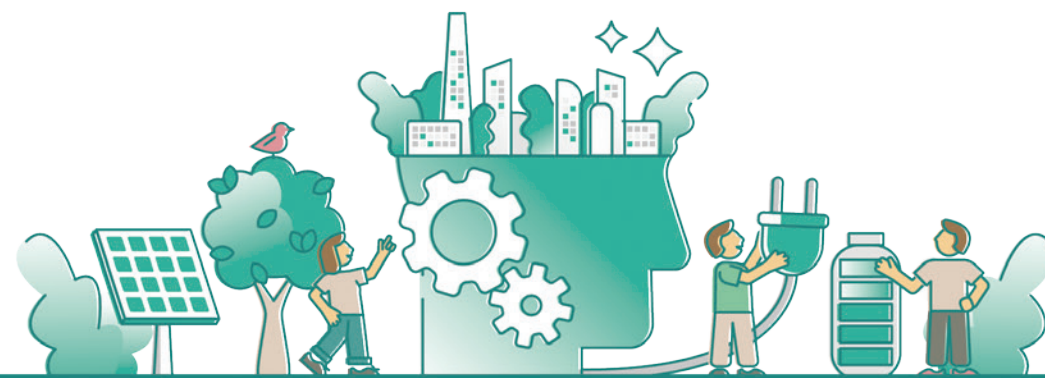
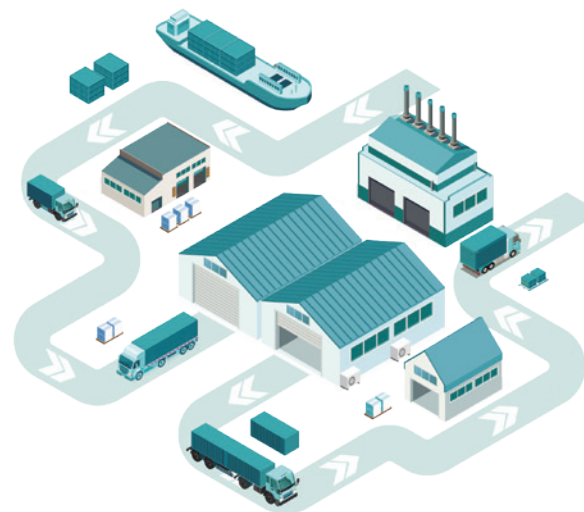
分层分级建立核心物资和技术产品需求清单，保持合理的库存和备用渠道，加强重点领域战略储备，做好必要时保证供应链安全的应对预案。

Created a demand list for core materials and technical products, categorized by tiers and levels. Maintained reasonable inventory levels and backup channels, reinforced strategic reserves in key areas, and prepared contingency plans to ensure supply chain security when necessary.



持续推动关键设备及零部件标准化、国产化，建立必要的产业备份系统，确保在关键核心技术、关键零部件、基础产品等供应受到断供等限制时，能够依靠自身实力保持供应链稳定，维护产业链安全。

Continuously promoted the standardization and localization of key equipment and components. Established essential industrial backup systems, ensuring that in the event of supply disruptions or restrictions on core technologies, key components, or basic products, the company can rely on its own strength to maintain supply chain stability and industrial chain security.



打造负责任供应链 Building a responsible supply chain



将 ESG 要素纳入供应商准入评价和日常考核，建立健全透明的供应链管理体系、供应商管理控制程序和供应商审核管理制度等内部管理制度，保障公司供应链质量水平，推进供应链可持续发展。

Integrated ESG elements into the supplier onboarding evaluation and regular assessments. Established and enhanced a transparent supply chain management system, supplier management control procedures, a supplier audit management system, and other internal management rules to ensure the quality level and sustainable development of the company's supply chain.



鼓励供应商采用清洁绿色能源、环保物料和设备、先进技术和工艺，使用环保、节能、低碳、资源再生化的材料，减少产业链的环境污染。

Encouraged suppliers to adopt clean and green energy, eco-friendly materials and equipment, advanced technologies and processes, and use eco-friendly, energy-saving, low-carbon, and renewable materials to reduce environmental pollution across the industrial chain.

坚持绿色采购 Holding to green procurement



鼓励各所属企业实施绿色采购，优先采购节能低碳环保材料、产品和服务。

Encouraged all subsidiaries to adopt green procurement practices and prioritize energy-efficient, low-carbon, and eco-friendly materials, products, and equipment.

地区	单位	2022	2023	2024
Region	Unit			
中国 China	家 No.	3,338	3,930	5,667
欧洲 Europe	家 No.	16	18	10
北美 North America	家 No.	1	7	5
亚洲（除中国） Asia (excluding China)	家 No.	1	5	0

指标	单位	2022	2023	2024
Indicator	Unit			
审查的供应商数量 Number of suppliers reviewed	家 No.	4,086	3,819	5,535
因不合规被终止合作的供应商数量 Number of suppliers rejected for non-compliance	家 No.	24	41	24

共建“一带一路” Jointly Building the Belt and Road

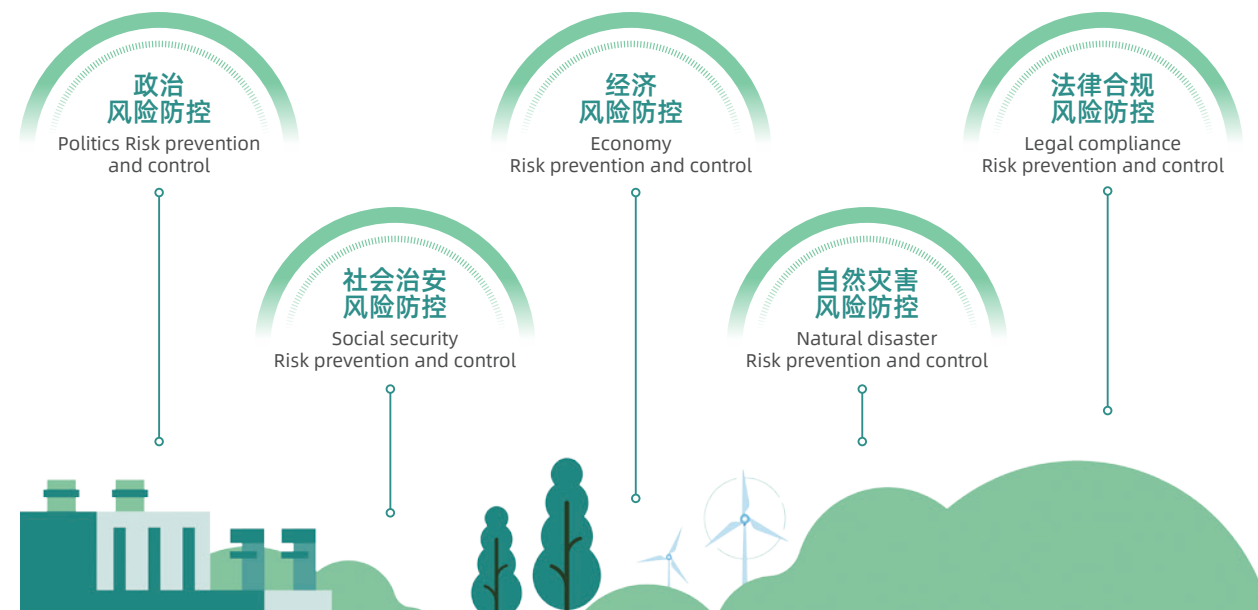
中国通号坚持国际化经营，坚决落实共建“一带一路”倡议和铁路“走出去”战略，积极参与全球产业分工，以轨道交通全产业链一站式服务能力为依托，带动新产业布局整体输出，携手实现共同繁荣。

CRSC adhered to business internationalization and resolutely implemented the "Belt and Road" Initiative and the railway "Going Out" strategy. It also actively participated in the global industrial division of labor. In addition, it leveraged its capabilities to offer one-stop services across the rail transit industry chain. Moreover, it drove the overall output of new industrial layouts and worked collaboratively to achieve common prosperity.

加强海外风险防控 Strengthening overseas risk prevention and control

坚持高质量发展理念，统筹发展与安全。加强海外风险防控，建立适应海外业务发展的风险合规体系，切实加强海外政治、经济、法律合规、社会治安、自然灾害等风险防控，健全风险预警机制，强化系统过程监督和管控，确保不发生重大系统性风险。

CRSC adhered to the concept of high-quality development to coordinate development and security. It also intensified overseas risk prevention and control. In addition, it established a risk compliance system tailored to the development of overseas business. Moreover, it effectively strengthened overseas management to ensure compliance with political, economic, and legal requirements. CRSC also made greater efforts to maintain social security, prevent and control natural disasters, and mitigate other risks. Additionally, it improved risk early warning mechanisms, strengthened system process supervision and control, and prevented the occurrence of major systemic risks.



高质量建设海外项目 Building overseas projects with high standards

持续发力海外铁路建设市场，以高质量交付项目，促进当地社会经济发展。推动匈塞铁路诺苏段收官，助力塞尔维亚打造地区交通和物流枢纽；孟中印缅经济走廊重要支撑项目孟加拉帕德玛大桥铁路连接线、墨西哥城地铁 1 号线改造项目开通，为当地民众出行提供更大便利；保障雅万高铁安全运营，提高物流运输效率，促进区域互联互通，带动当地就业、促进服务业、旅游业以及沿线经济社会发展，打造“雅万高铁经济带”，为印尼增添新的经济增长点。

CRSC continued to focus on the overseas railway construction market, delivering high-quality projects to support local social and economic development. It also facilitated the completion of the Novi Sad-Subotica Section of the Hungary-Serbia Railway and assisted Serbia in building a regional transportation and logistics hub. The Padma Bridge Rail Link, a key infrastructure project under the Bangladesh-China-India-Myanmar Economic Corridor (BCIM-EC), and the renovation of Mexico City Metro Line 1 were both completed, significantly improving local transportation convenience. Additionally, CRSC made efforts in ensuring the safe operation of the Jakarta-Bandung High-Speed

Railway to improve logistics transportation efficiency, promote regional connectivity, increase local employment, and promote service and tourism industries, as well as economic and social development along the railway. These efforts also created the "Jakarta-Bandung High-Speed Railway Economic Belt" to add new economic growth opportunities for Indonesia.

指标 Indicator	单位 Unit	2022	2023	2024
境外业务涉及国家（地区） Number of countries/regions covered by the overseas business	个 Pcs	12	26	24
设立境外单位 Number of subordinate operations/units established overseas	户 EA	34	34	14
境外业务涉及国家（地区） Number of countries/regions covered by the overseas business	个 Pcs	16	15	18



案例·Case

The Novi Sad-Subotica section of the Hungary-Serbia Railway, equipped with CRSC's fully autonomous train control system, was fully connected

2024 年 4 月，搭载中国通号全自主化 ETCS-2 级列控系统的匈塞铁路塞尔维亚境内诺苏段轨道全部贯通，诺维萨德至维尔巴斯区间列车动态实验达到最高设计时速 200Km/h，标志着匈塞铁路建设取得新的重大进展，为下一步全线开通运营奠定坚实基础。

In April 2024, the Novi Sad-Subotica section of the Hungary-Serbia Railway (within Serbia), equipped with the fully autonomous ETCS-2 train control system from CRSC, was fully connected. During a dynamic experiment, trains on the section from Novi Sad to Vrbas reached the maximum design speed of 200 km/h. This marked significant progress in the construction of the Hungary-Serbia Railway and laid a solid foundation for the next phase of full line operation.



中国驻塞尔维亚大使李明，中国国家铁路集团有限公司党组成员、副总经理王同军，中国通号党委常委、副总裁赵晓东等参加全线轨道贯通仪式
Li Ming, the Chinese Ambassador to Serbia, along with Wang Tongjun, a Party Group member and Deputy General Manager of China Railway, and Zhao Xiaodong, a Standing Committee member of the Party Committee and Vice President of CRSC, attended the completion ceremony of the entire Novi Sad-Subotica section.



回应的 SDGs
SDGs

10 减少不平等



11 可持续城市和社区



担当有爱 守护美好生活

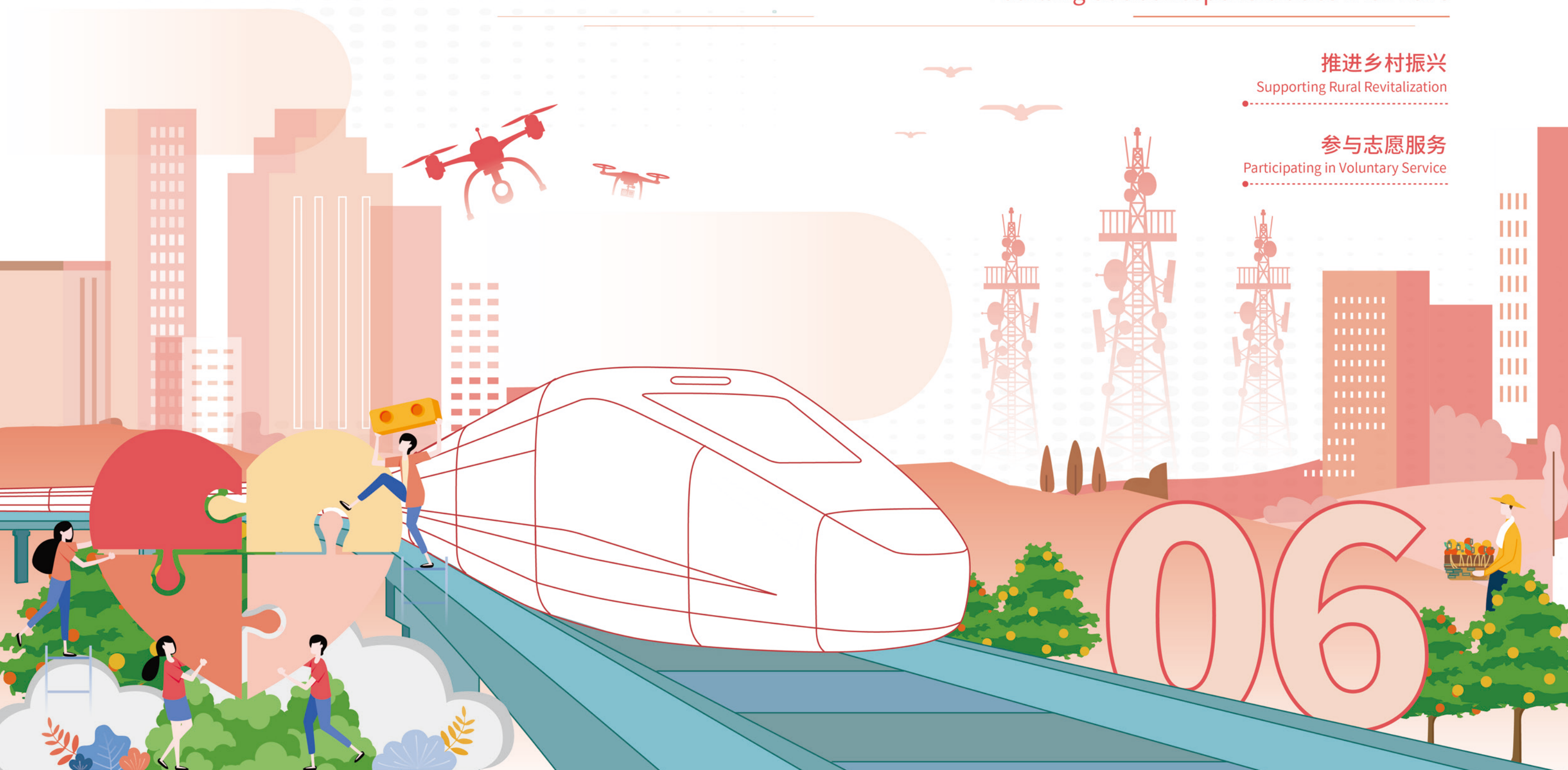
Making Our Lives Better by
Fulfilling Social Responsibilities with Love

推进乡村振兴

Supporting Rural Revitalization

参与志愿服务

Participating in Voluntary Service



推进乡村振兴

Supporting Rural Revitalization

中国通号深入学习贯彻习近平总书记关于“三农”工作的重要指示批示精神，深入贯彻落实党的二十大精神，深入开展帮扶项目调研，持续加强帮扶投入，全力做好定点帮扶工作，多措并举实现农民增收、村庄富美，为全面推进乡村振兴贡献通号力量。

CRSC has thoroughly studied and implemented General Secretary Xi Jinping’s key directives on the work of agriculture, rural areas, and farmers. It has fully embraced the spirit of the 20th National Congress of the Communist Party of China, conducted in-depth research on assistance projects, continuously increased investment in support initiatives, and made every effort to ensure effective targeted assistance work. The company took multiple measures to increase the income of rural residents and improve the economy and environment of rural areas, making its contributions to the comprehensive advancement of rural revitalization.

指标 Indicator	单位 Unit	2022	2023	2024
投入无偿帮扶资金 Free assistance funds invested	万元 CNY 10,000	581	550	1,000
培训基层干部 Number of grassroots cadres trained	人次 Person	121	431	1,416
培训乡村振兴带头人 Number of leaders trained for rural revitalization	人次 Person	101	166	637
培训专业技术人才 Number of professional and technical talents trained	人次 Person	123	220	1,217
购买农产品 Agricultural products purchased	万元 CNY 10,000	147+	202+	385.4
帮助销售农产品 Sales of agricultural products promoted	万元 CNY 10,000	571+	2,100	2,112.49



深化定点帮扶

Deepening targeted assistance

产业振兴

Rural economy revitalization

提高村集体收入
20 万元
Resulting in a CNY 200,000 increase in village collective income

坚持把发展蔬菜相关产业作为巩固拓展脱贫攻坚成果、推进乡村振兴的首要举措，推动李店蔬菜园、饶良镇张庄蔬菜（烟菜轮作）产业基地建设项目，针对产业基地内基础设施薄弱，生产设施不配套情况，出资 265 万元用于基础道路铺设，农业产业化设施及农业灌溉用井，有效提高生产效率和保障能力，提高村集体收入 20 万元；出资 26 万元建设社旗县太和镇刘集村蔬菜基地，每年确保增加村集体收入 5 万元以上，有效带动周边贫困群众就业增收。

CRSC remains committed to developing vegetable-related industries as a key strategy to consolidate and expand the achievements of poverty alleviation while promoting rural revitalization. The company promoted the building of Lidian Vegetable Market and Raoliang Zhangzhuang Vegetable (Tobacco & Vegetable Rotation) Base. Recognizing the underdeveloped infrastructure and inadequate production facilities within the base, CRSC has invested CNY 2.65 million to construct essential roads, build agricultural industrialization facilities and drill agricultural irrigation wells. These improvements have significantly enhanced production efficiency and capacity, resulting in a CNY 200,000 increase in village collective income. The company has invested CNY 260,000 to build a vegetable base in Liuji Village, Taihe Town, Sheqi County, ensuring an annual increase of over CNY 50,000 in village collective income. This initiative has also effectively boosted employment opportunities and income growth for impoverished residents in surrounding areas.

人才振兴

Rural talent revitalization

培训乡村基层干部
1,416 人次
The company offered special training courses for 1,416 grassroots rural cadres
培养乡村振兴带头人
637 人次
offered special training courses for 637 rural entrepreneurship leaders

多措并举助力乡村人才振兴。举办乡村基层干部专题培训班、农村创业致富带头人专题培训班，培训乡村基层干部 1,416 人次、乡村振兴带头人 637 人次、专业技术人才 1,217 人次；组织全县 16 个乡镇 304 名省市派驻村第一书记赴周边县市五星村支部优秀典型调研，学习党建与支部建设的优秀经验，受到广泛好评；打造“电商基地”+“农业技术培训基地”，逐步形成两个基地相辅相成、相得益彰良好局面，为全县孵化企业和培育人才提供优势条件。

CRSC implemented multiple measures to support rural talent revitalization. The company offered special training courses for 1,416 grassroots rural cadres, 637 rural entrepreneurship leaders, and 1,217 professional and technical talents. Additionally, CRSC organized 304 the first secretaries, assigned by 16 provincial and municipal government agencies, to be stationed in villages throughout the county. These secretaries conducted field research and gained insights into Party building and Party Branch construction from the Five-Star Village Branches in surrounding counties and cities, earning widespread praise. Furthermore, CRSC introduced an "e-commerce base + agricultural technology training base" development mode, and gradually created a favorable situation where the two bases complement each other. This integrated approach provides optimal conditions for enterprise incubation and talent cultivation throughout the county.



案例·Case

投资援建农业技术培训基地

Investment and support in building agricultural technology training bases

2024年12月，中国通号在社旗县苗店镇安菜达蔬菜基地投资援建的农业技术培训基地正式揭牌。该基地建筑总面积950平方米，设有培训中心、展厅、化验室等功能室，能容纳120人培训，投入使用以来，累计培训120余场次，为社旗县推进乡村全面振兴提供了坚强人才支撑。

In December 2024, the Agricultural Technology Training Base, funded by CRSC as an aided project at the Ancaida Vegetable Base, Miaodian Town, Sheqi County was officially unveiled. The base has a building area of 950 square meters, and is provided with many functional rooms, such as a training center, exhibition hall and laboratory, enough for accommodating 120 trainees. Since its opening, more than 120 training sessions have been offered, providing strong talent support to drive the comprehensive revitalization of rural areas in Sheqi County.



楼齐良参观艾制品展厅，并就下一阶段工作开展进行交流

Lou Qiliang visited the Ai products exhibition hall and exchanged ideas on the next stage of work

文化振兴

Rural culture
revitalization

选取交通便利的饶良镇黑刘庄村率先打造开放式乡里服务中心，出资41万元，在原有党群服务中心基础上适当扩大、完善功能、改造提升；出资75万元选取朱集镇袁老庄村部进行提升改造。

CRSC has selected Heiliuzhuang Village in Raoliang Town, which has convenient transportation, as the first pilot base for building an open township service center. The company invested CNY 410,000 to appropriately expand, enhance and upgrade the functions of the existing Party-Mass Service Center. Additionally, CNY 750,000 was allocated for upgrading and renovating the selected Yuanlaozhuang Village in Zhuji Town.

组织振兴

Rural
organization
revitalization

组织系统内5个基层党支部与包括集团定点帮扶村袁老庄村在内的7个村党支部建立结对关系，先后开展了“支部联建强堡垒 结对共建聚合力”等一系列共建帮扶活动。

CRSC facilitated the establishment of paired relationships between 5 grassroots Party branches within the Group and Party branches in 7 villages, including Yuanlaozhuang Village under the targeted assistance program. Through a series of co-building and assistance activities, the initiative aimed to strengthen community engagement by jointly building Party branches and enhancing cohesion through paired assistance.



开展消费帮扶

Providing consumption-based assistance

以中国通号电商平台为发力点，线上线下相结合，借助各类新媒体平台及央企消费帮扶平台推广销售社旗县优质农产品。发动全系统广大干部职工积极参与“央企消费迎新行动”“央企消费帮扶兴农周”“兴农周线下展销会”等活动。报告期内，共采购社旗县特色农副产品385.4万元，助销社旗县特色农副产品2,112.49万元。

CRSC leverages its own e-commerce platforms and integrates online and offline channels to promote and sell high-quality agricultural products from Sheqi County through various new media platforms and Central SOE consumption-based assistance platforms. The company mobilized all cadres and employees of the group to actively participate in initiatives such as the "New Year Consumption-Based Assistance Action of Central SOEs", "Rural Revitalization and Consumption-Based Assistance Week of Central SOEs", "Rural Revitalization Week Offline Trade Fair" and others. During the reporting period, CRSC facilitated the purchase of CNY 3,854,000 worth of characteristic agricultural and sideline products from Sheqi County and contributed to the sale of CNY 21,124,900 worth of these products.



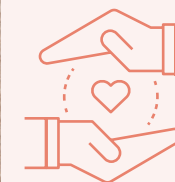
参与志愿服务 Participating in Voluntary Service

中国通号深入开展新时代新征程青年创新创业活动和岗位建功行动，持续引领广大青年开展志愿服务行动，积极扩大“同心筑梦”志愿服务品牌效应，坚持围绕中心、服务大局，团结带领广大青年志愿者弘扬“奉献、友爱、互助、进步”的志愿服务精神，持续健全志愿服务机制、丰富志愿服务载体、拓展志愿服务项目、壮大志愿服务队伍、培育志愿服务文化。

CRSC has actively engaged in youth innovation, benefit creation, and job contribution initiatives in this new era and journey. It has continuously guided young people to carry out voluntary services, actively expanding the brand effect of the "Building Dreams Together" voluntary program. Adhering to the principle of "centering on core tasks and aligning with overall strategy," CRSC unites and leads young volunteers in promoting the volunteer spirit of "active dedication, mutual care, mutual assistance and collective progress." Additionally, it continues to enhance the voluntary service mechanism, enrich voluntary service carriers, expand voluntary service programs, strengthen voluntary service teams and foster a culture of volunteerism.



上海工程局集团青年志愿者全力保障第七届进博会期间轨道交通运营安全
Youth volunteers from CRSC Shanghai Engineering Bureau Group devoted all efforts to ensure the safety of rail transit operations during the 7th China International Import Expo



城交公司研发中心青年志愿者在公司园区附近
捡拾垃圾，整理摆放共享单车

Young volunteers from the R&D Center of CRSC Urban Rail Transit Technology collected garbage and organized shared bicycles in the neighborhood



通号电缆集团青年志愿者参加天水市共青团学雷锋志愿服务活动启动仪式
Youth volunteers from CRSC Cables Group participated in the launch ceremony of the Youth League Learning Lei Feng Voluntary Service Activity in Tianshui City



国际控股开展绿色环保志愿服务活动
CRSC International organized green environmental protection voluntary service activity



研究设计院集团开展“青春暖夕阳”助老敬老活动
CRSC Research & Design Institute Group organized young employees to conduct a "Caring Senior Citizen" activity



卡斯柯员工深入甘肃莫高窟治沙站，开展麦草方格沙障铺设活动
CASCO's employees went deep into the Mogao Grottoes Sand Control Station in Gansu Province to carry out a straw checkerboard barrier installation activity



未来展望 Future Outlook

迎风起航新时代，砥砺前行正当时。2025 年是“十四五”规划的收官之年，也是将全面深化改革推向纵深的关键之年。面对新形势新任务，中国通号将始终胸怀“国之大者”，坚定服务国家战略，牢牢把握高质量发展首要任务，更加主动在服务党和国家事业全局中谋划推进工作，更好以中国通号所长服务国家所需，在轨道交通领域坚持以数智赋能升级巩固深化“三位一体”全产业链新优势，在低空经济领域以市场有效落地完整塑造“三业一态”产业格局，切实发挥央企“三个作用”，争当“三个排头兵”，蹄疾步稳布局新赛道、培育新动能，为建设科技强国、推进中国式现代化作出新的更大贡献！

Sailing forward in the new era, we are forging ahead with determination at the right time. The year 2025 marks the final year of the 14th Five-Year Plan period and a critical year for driving reform to deeper levels. Facing a new situations and tasks, CRSC will bear in mind the country's most fundamental interests, contribute effectively to national strategies, and stay focused on the primary task of high-quality development. We will take a more proactive approach in planning and advancing our work within the broader framework of endeavors of the Party and the country and leverage our strengths to serve national needs more effectively. In the rail transit sector, we will continue to enhance and consolidate our full-industry-chain advantage in R&D and design, manufacturing, and engineering construction through digital and intelligent empowerment. In the low-altitude economy sector, we will drive effective market implementation to establish a low-altitude economy ecosystem through low-altitude airspace management, UAV manufacturing, and service operations. We will give full play to our role as a central enterprise in technological innovation, industry control, and security support, striving to be a pioneer in implementing the new development philosophy, driving innovation-led growth, and executing major national strategies. With firm and steady steps, we will strategically position ourselves in emerging fields and foster new growth drivers to make greater contributions to building China's strength in science and technology and advancing Chinese modernization.

附录

Appendix

ESG 指标索引

ESG Indicator Guide

上海证券交易所《上市公司自律监管指引第 14 号——可持续发展报告（试行）》

Guidelines No. 14 of the Shanghai Stock Exchange for the Self-regulation –Sustainability Report (Trial)

维度 Dimension	序号 No.	议题 Topic	对应条款 Corresponding Article	页码 Page No.
环境 Environment	1	应对气候变化 Climate Change Response	第二十一条至第二十八条 Articles 21 to 28	80-84
	2	污染物排放 Pollution Emissions	第三十条 Article 30	89-92
	3	废弃物处理 Waste Management	第三十一条 Article 31	89-92
	4	生态系统和生物多样性保护 Ecosystem and Biodiversity Protection	第三十二条 Article 32	93
	5	环境合规管理 Environmental Compliance Management	第三十三条 Article 33	76
	6	能源利用 Energy Use	第三十五条 Article 35	84-87
	7	水资源利用 Water Resources Use	第三十六条 Article 36	88
	8	循环经济 Circular Economy	第三十七条 Article 37	88
社会 Society	9	乡村振兴 Rural Revitalization	第三十九条 Article 39	122-125
	10	社会贡献 Social Contribution	第四十条 Article 40	126-127
	11	创新驱动 Innovation Driven	第四十二条 Article 42	57-73
	12	科技伦理 Technological Ethics	第四十三条 Article 43	N/A
	13	供应链安全 Supply Chain Security	第四十五条 Article 45	114-116
	14	平等对待中小企业 Equal Treatment of Small and Medium - sized Enterprises	第四十六条 Article 46	N/A
	15	产品和服务安全与质量 Safety and Quality of Products and Services	第四十七条 Article 47	50-53
	16	数据安全与客户隐私保护 Data Security and Customer Privacy Protection	第四十八条 Article 48	47
	17	员工 Employees	第五十条 Article 50	96-107
可持续发展 相关治理 Governance	18	尽职调查 Due Diligence Investigation	第五十二条 Article 53	N/A
	19	利益相关方沟通 Stakeholder Communication	第五十三条 Article 53	23-24
	20	反商业贿赂及反贪污 Anti-commercial Bribery and Anti-corruption	第五十五条 Article 55	44-46
	21	反不正当竞争 Anti-unfair Competition	第五十六条 Article 56	44-46

香港联交所《环境、社会及管治报告指引》
Environmental, Social and Governance (ESG) Reporting Guide issued by HKEX

指标披露 General Disclosures and KPIs		页码 Page No.
范畴： 环境 A: Category: Environment A:		
A1：排放物 A1: Emissions		
一般披露 General disclosure		
A1.1	排放物种类及相关排放数据。 The types of emissions and respective emissions data	92
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）。	82
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）。	92
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）。	92
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。	84-88
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。	90-91
A2：资源使用 A2: Use of resources		
一般披露 General disclosure		
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）。	87
A2.2	总耗水量及密度（如以每产量单位、每项设施计算）。	88
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。	84-87
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。	88
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。	89
A3：环境及天然资源 A3: Environment and natural resources		
一般披露 General disclosure		
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。	93
A4. 气候变化 A4: Climate change		
一般披露 General disclosure		
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。	82-83

指标披露 General Disclosures and KPIs		页码 Page No.
范畴：社会 B Category: society B		
雇佣及劳工准则 Employment and Labor Standards		
B1：雇佣 B1: Employment		
一般披露 General disclosure		
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	96-97
B1.2	按性别、年龄组别及地区划分的雇员流失比率。 Employee turnover rate by gender, age group and geographical region	N/A
B2：健康与安全 B2: Health and safety		
一般披露 General disclosure		
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)	55
B2.2	因工伤损失工作日数。 Lost days due to work injury	55
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	104
B3：发展及培训 B3: Development and training		
一般披露 General disclosure		
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)	102
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	102
B4：劳工准则 B4: Labor guidelines		
一般披露 General disclosure		
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	98
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	98
营运管理 Operation management		
B5：供应链管理 B5: Supply chain management		
一般披露 General disclosure		
B5.1	按地区划分的供货商数目。 Number of suppliers by geographical region	116

指标披露 General Disclosures and KPIs		页码 Page No.
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, and how they are implemented and monitored	116
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	114
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	116
B6：产品责任 B6: Product responsibility		
一般披露 General disclosure		
B6.1	已售或已运送产品总数因安全与健康理由而需回收的百分比。 Percentage of total products sold or shipped subject to recalls for safety and health reasons	N/A
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	52-53
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	69
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	50-51
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	46-47
B7：反贪污 B7: Anti-corruption		
一般披露 General disclosure		
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	46
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	46
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 employees	45-46
社区 Community		
B8：社区投资 B8: Community investment		
一般披露 General disclosure		
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)	123-125
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	122

评级报告

《中国铁路通信信号股份有限公司 2024 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 2024 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《中国企业可持续发展报告指南（CASS-ESG 6.0）》暨“中国企业社会责任报告评级专家委员会”《中国企业可持续发展报告评级标准（2025）》。

二、评级过程

1. 评级小组审核确认《报告》编写组提交的《企业可持续发展报告过程性评估资料确认书》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署评级报告。

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。将报告定位为提高社会责任管理水平、传播企业责任品牌形象、披露企业履责信息、回应利益相关方信息披露需求、满足信息合规披露的有效工具，功能价值定位明确。结合国家宏观政策、行业对标分析、公司重大事项、国内外 ESG 标准等识别实质性议题；计划通过官方网站发布中英文版本报告，并将以印刷品的形式呈现报告，过程性表现卓越。

实质性 (★★★★★)

《报告》披露了应对气候变化、污染物排放、废弃物处理、节约能源资源、环保产品或技术的研发和应用、推动运输设备绿色化、生态系统与生物多样性保护、可持续供应链、产品和服务安全与质量等铁路、船舶、航空航天和其他运输设备制造业关键性议题，叙述详细充分，实质性表现卓越。

完整性 (★★★★★)

《报告》主体内容从“稳健经营，深化价值创造”“精耕主业，建设世界一流”“以绿为笔，绘就绿水青山”“海纳英才，打造幸福职场”“深化合作，携手互利共赢”“担当有爱，守护美好生活”等角度系统披露了铁路、船舶、航空航天和其他运输设备制造业核心指标的 71.6%，具有优秀的完整性表现。

平衡性 (★★★★☆)

《报告》披露了“投诉解决率”“未发生突发环境事件”“未发生铁路交通一般 C 类及以上责任事故、工程质量一般及以上责任事故、重大质量问题”“因工亡故人数”“未发生信息安全事件和客户隐私泄露事件”“新增职业病数”“未发生不正当竞争事件和商业贿赂及贪污事件”“未发生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”等负面数据信息，具有卓越的平衡性表现。

可比性 (★★★★★)

《报告》披露了“营业收入”“资产总额”“温室气体排放总量”“综合能源消耗量”“投入无偿帮扶资金”“培训乡村振兴带头人”等 117 个关键指标连续三年的对比数据，并通过“‘中国 ESG 上市公

司先锋 100’榜单，位列第 17”“‘中国 ESG 上市公司京津冀先锋 50(2024)’企业，位列第 5”等指标进行横向比较，具有卓越的可比性表现。

可读性 (★★★★★)

《报告》采用议题型框架结构，从公司治理、主责主业、环境保护、员工发展、伙伴合作、回馈社会等重点议题出发，阐述公司履责理念、实践与成效，充分回应了利益相关方的期望与诉求；采用矢量风格，融入主营业务元素，篇章页嵌入对 SDGs 的回应；设置“中国通号·荣誉 2024”，集中展示公司年度亮点成就；正文中设置“通号档案”栏目解读行业专业术语，增强了报告的易读性，具有卓越的可读性表现。

创新性 (★★★★☆)

《报告》积极响应和重点回应联合国可持续发展目标，展现企业年度履责绩效和关键议题亮点实践；参与报告评级，既提升了企业社会责任管理意识和高度，又增强了企业社会责任工作的规范性和可信度，具有领先的创新性表现。

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 2024 环境、社会及管治报告》为五星级，是一份卓越的可持续发展报告。



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五年获得五星级评价

四、改进建议

1. 持续提升报告披露的指标覆盖范围，进一步提高报告的完整性；
2. 增强报告内容和设计的表现形式，进一步提升报告的创新性。

黄群慧

评级专家委员会副主席

邓国胜

评级小组组长

钟宏武

评级小组专家



扫码查看企业评级档案

出具时间：2025 年 3 月 26 日

Rating report

Rating Report of "The 2024 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 2024 Environment, Social and Governance Report of China Railway Signal & Communication Co., LTD. (hereinafter referred to as "the report").

I. Rating Criteria

The "Guidelines for Chinese Enterprises' Sustainable Development Reports (CASS-ESG 6.0)" by the Chinese Academy of Social Sciences and the "Rating Standards for Chinese Enterprises' Sustainable Development Reports (2025)" by the "Expert Committee on CSR Report Rating of Chinese Enterprises".

II. Rating Process

1. The rating team reviewed and confirmed the "Confirmation Letter of Process Assessment Materials for Enterprise Sustainable Development Reports" and relevant supporting materials submitted by the Report compilation team.
2. The rating team evaluated the compilation process and content of the Report and prepared a draft rating report.
3. The vice chairperson of the rating expert committee, the leader of the rating team, and the experts of the rating team jointly signed and reviewed the rating report.

III. Rating Results

Process (★★★★★)

The company established a report compilation working group, with the Party-Masses Work Department taking the lead in coordinating and overall planning the report compilation work. The Party Committee and the Board of Directors supervised the content and overall direction of the report and were responsible for the final review. The report is positioned as an effective tool to improve social responsibility management, promote the corporate social responsibility brand image, disclose corporate social responsibility information, meet the information disclosure needs of stakeholders, and ensure compliance with information disclosure requirements. The functional value is clearly defined. Substantive issues were identified by considering national macro policies, industry benchmarking analysis, major corporate events, and domestic and international ESG standards. It is planned to release the report in Chinese and English versions on the official website and present it in printed form. The performance in the process is outstanding.

Materiality (★★★★★)

The Report discloses key issues in the manufacturing of railway, ship, aerospace, and other transportation equipment industries, such as addressing climate change, pollution emissions, waste management, saving energy and resources, research and application of environmental protection products or technologies, promotion of green transportation equipment, ecosystem and biodiversity protection, responsible supply chain, and safety and quality of products and services with sufficient detailed description and excellent materiality performance.

Integrity (★★★★★)

The main content of the Report systematically discloses 71.6% of the core indicators in the manufacturing of railway, ship, aerospace, and other transportation equipment industries from perspectives such as "Deepening Value Creation through Stable Operation", "Building a World-Class Enterprise by Devotedly Developing Main Business", "Painting Lucid Waters and Lush Mountains Against a Green Background", "Creating a Happy Workplace to Attract Talents Globally", "Joining Hands for Mutual Benefit Through Intensive Cooperation", and "Making Our Lives Better by Fulfilling Social Responsibilities with Love". It shows excellent integrity.

Balance (★★★★☆)

The Report discloses negative data such as "Complaint resolution rate", "No environmental emergencies occurred", "No minor (class C) rail accidents or higher, no minor project quality accidents or higher, and no major quality issues occurred", "Number of deaths due to work-related reasons", "No information security incidents or customer privacy breaches", "Number of newly added occupational diseases", "No incidents of unfair competition, commercial bribery or corruption occurred", and "No minor or major work safety accidents, special equipment incidents, or fire accidents occurred", with good Balance performance.

Comparability (★★★★★)

The Report discloses the comparative data of 117 key indicators for three consecutive years, such as "Total operating income", "Total assets", "Total greenhouse gas (GHG) emissions", "Aggregate energy consumption", "Free assistance funds invested", and "Number of leaders trained for rural revitalization". It also conducts horizontal comparisons through indicators such as "Ranked 17th on the 'ESG Pioneer Top

100 Listed Companies in China" and "Ranked 5th on the '2024 ESG Pioneer Top 50 Listed Companies in the Beijing-Tianjin-Hebei Region", with excellent comparability performance.

Readability (★★★★★)

The Report adopts an issue-based framework structure. Starting from key issues such as corporate governance, core business, environmental protection, employee development, partner cooperation, and social return, it elaborates on the company's social responsibility concepts, practices, and achievements, fully responding to the expectations and demands of stakeholders. Adopt a vector style, integrate elements of the main business, and embed responses to the SDGs on the chapter pages. It sets up "Awards and Honors Won by CRSC in 2024" to centrally display the company's annual highlights and achievements. In the main text, the "CRSC's file" column is set up to explain industry-specific terms, enhancing the readability of the report, with excellent readability performance.

Innovation (★★★★☆)

The Report actively responds to and focuses on the United Nations Sustainable Development Goals, demonstrating the company's annual social responsibility performance and highlight practices of key issues. Participating in the report rating not only enhances the awareness and standards of corporate social responsibility management, but also improves the compliance and credibility of its social responsibility work, demonstrating good innovativeness performance.

Comprehensive Rating (★★★★★)

The 2024 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 2024 Environment, Social and Governance Report of China Railway Signal & Communication Co., LTD. gained the five-star evaluation for a fifth consecutive year

IV. Improvement Suggestions

1. Continuously expand the coverage of disclosed indicators in the report to further improve the integrity of the report.
2. Enhance the presentation forms of the report content and design to further improve the innovation of the report.

黄群慧

Vice Chairman of China Expert Committee on CSR Report Rating

邓国胜

Panel Leader

钟宏武

Panel Expert



Scan the QR code to view the corporate rating files

Date of Issuance: March 26, 2025

意见反馈 Rating report

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2024 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下方二维码，对我们的报告提出宝贵意见。

Thank you very much for reading the 2024 Environmental, Social and Governance Report of China Railway Signal & Communication 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 below to offer your constructive comments and suggestions. Thanks for your time and patience!





扫描二维码了解更多信息



中国通号

中国铁路通信信号股份有限公司

地址：北京市丰台区南四环汽车博物馆南路 1 号院中国通号大厦

邮编：100070

电话：010-50809090

网址：www.crsc.cn

Email：crsc@crsc.com.cn

报告出版的环境考虑

纸张：采用环保纸张印刷

油墨：采用环保油墨以减少空气污染