

首钢国际工程公司是由原北京首钢设计院改制成立、首钢集团相对控股的国际型工程公司，是北京市首家获得工程设计综合甲级资质的市属企业。公司可承揽各行业、各等级的所有工程设计，同时可提供规划咨询、设备成套、工程总承包等技术服务。公司在钢铁厂总体规划设计，炼铁、炼钢、轧钢、烧结、球团、焦化、工业炉单项设计，冶金设备成套等方面具有独到优势和丰富业绩。

公司业绩遍布国内70余家钢铁企业，以及巴西、印度、马来西亚、越南、孟加拉、菲律宾、津巴布韦、安哥拉、秘鲁、沙特等多个国家。

公司是北京市高新技术企业，获得国家科学技术奖和全国优秀设计奖等30余项、冶金行业和北京市优秀设计及科技成果奖等近300项，拥有数百项专利技术，多个项目创中国企业新纪录。

BSIET is an international engineering company established through reorganization of Beijing Shougang Design Institute. It is invested by Shougang Group who takes relative majority of the share.

BSIET has the Engineering Design Integrated Qualification Class A issued by the State. It is the first unit of Beijing municipal enterprises awarded this Qualification and is able to undertake engineering design for all industries and all grades. Meanwhile, it can provide technical services such as planning consultation, equipment integration and general contracting. BSIET owns unique technology and rich practical experience in overall design of iron and steel plants, individual design for iron making, steel making, steel rolling, sintering, pelletizing, coking, industrial furnace and integration of metallurgical equipment.

BSIET has served more than 70 iron and steel enterprises in China, and has its achievements in more than 20 countries such as India, Malaysia, Brazil, Viet Nam, Bangladesh, the Philippines, Zimbabwe, Angola, Peru and Saudi Arabia, etc.

BSIET is Hi-tech Enterprise of Beijing City, and has been awarded with 30-odd national science & technology prizes and national excellent design prizes, nearly 300 metallurgical industry and Beijing city excellent design and achievement prizes, and hundreds of national patents. Dozens of projects have created the new records of the Chinese enterprises.



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给排水工程与技术

WATER SUPPLY AND DRAINAGE



源自百年首钢 服务世界钢铁
Expertise from hundred-year Shougang



北京首钢国际工程技术有限公司
BEIJING SHOUGANG INTERNATIONAL ENGINEERING TECHNOLOGY CO.,LTD.

从上世纪60年代全面完成首钢集团给排水系统设计，到如今为国内外钢铁企业及市政行业提供全面水处理解决方案，首钢国际工程公司在给排水工程与技术领域，历经四十余年的发展，通过数百个项目的成功实施，形成了一系列优势技术和专有技术，积累了丰富的项目实践经验。

在给排水领域，首钢国际工程公司拥有国家、冶金行业、北京市颁发的科技进步及优秀设计奖8项，国家发明及实用新型专利10余项。公司能够为国内外客户提供以下各类给排水工程的咨询、设计、设备成套及工程总承包服务：

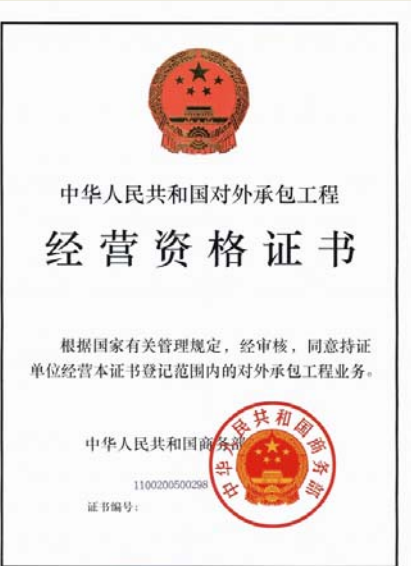
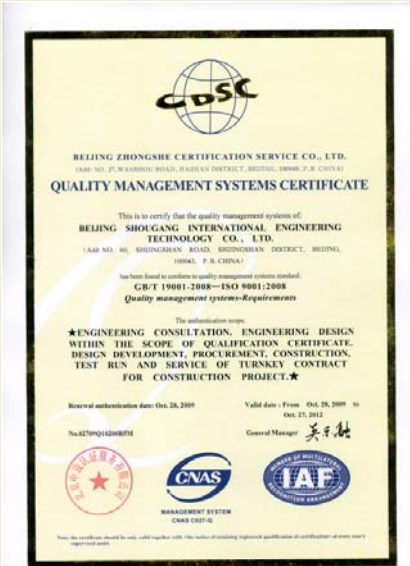
- ◎ 钢铁厂水源取水
- ◎ 钢铁厂水源输送
- ◎ 钢铁厂原水处理
- ◎ 钢铁厂尾部综合污水处理
- ◎ 钢铁厂各工序特殊污水的生化、物化和膜法处理
- ◎ 海水直流冷却
- ◎ 海水淡化
- ◎ 钢铁厂各工序配套的水处理设施
- ◎ 给排水综合管网
- ◎ 建筑给排水
- ◎ 消防及环保工程
- ◎ 市政给水工程
- ◎ 市政排水工程



工程设计综合甲级资质
Engineering Design Integrated Qualification Class A



ISO9001质量管理体系认证
Certification of ISO9001 Quality Management System

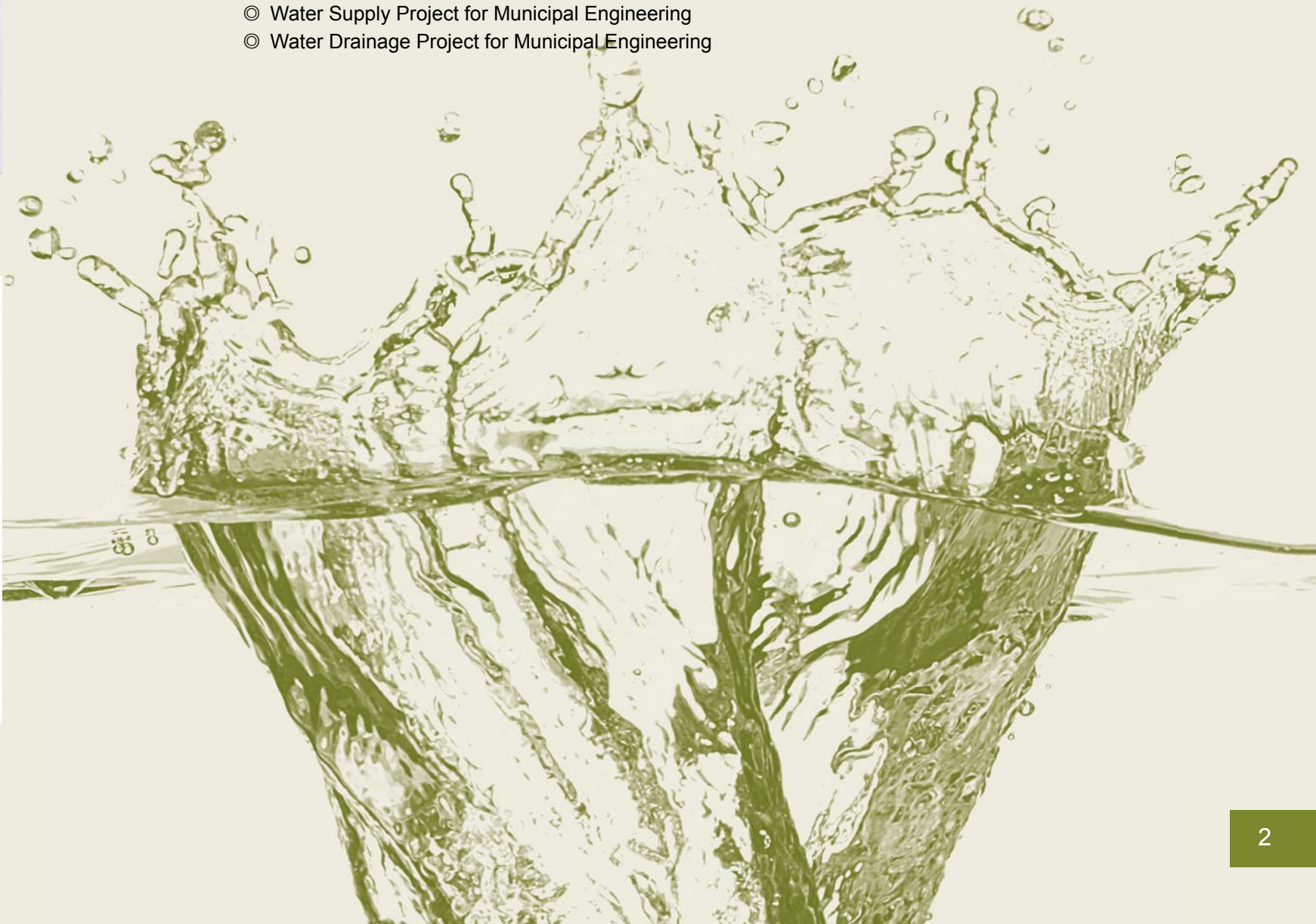


对外承包工程经营资格
Qualification Certificate of Overseas Project Contracting

From the comprehensive design of water supply and drainage system for Shougang Group in 1960s to current overall water treatment solution for both domestic and foreign iron & steel enterprises, and municipal industries, BSIET has, through more than 40 years development and hundreds successful projects, mastered a series of advantageous and exclusive technologies and accumulated abundant practical project experiences in water supply and drainage engineering technology.

In water supply and drainage technology field, BSIET has been honored 8 prizes titled Science and Technology Progress Prize or Excellent Design Prize separately issued by state, metallurgical industry or Beijing Municipality. BSIET can provide the consultation, engineering, integration of equipment and EPC service of the following various water supply and drainage projects for both domestic and foreign clients.

- ◎ Iron & Steel Plant Source Water Intake
- ◎ Iron & Steel Plant Source Water Transportation
- ◎ Iron & Steel Plant Raw Water Treatment
- ◎ Overall Waste Water Treatment at the Tail of Iron & Steel Plant
- ◎ Biochemical, Physiochemical and Membranization Treatment of Special Wastewater from Various Process Steps of Iron & Steel Plant
- ◎ Nonrecovery Seawater Cooling
- ◎ Seawater Desalination
- ◎ Water Treatment Device Suited to Various Process Steps of Iron & Steel Plant
- ◎ Integrated Pipeline Network for Water supply and drainage
- ◎ Building Water Supply and Drainage
- ◎ Fire Fighting and Environmental Protection Engineering
- ◎ Water Supply Project for Municipal Engineering
- ◎ Water Drainage Project for Municipal Engineering



钢铁厂综合污水处理技术

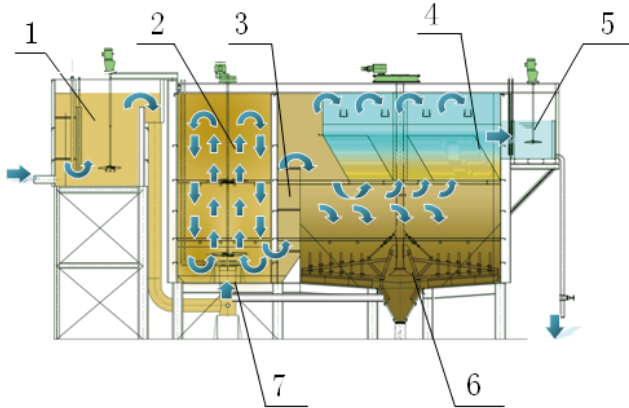
Comprehensive Waste Water Treatment Technology for Iron & Steel Plant

首钢国际工程公司致力于钢铁厂综合污水处理工艺的研发和装备的比选与优化，形成了适应各种工况的、完整的钢铁厂综合污水处理技术，拥有专利技术和多项应用业绩。

BSIET devoted to the innovation of comprehensive waste water treatment process for Iron & Steel Plant, as well as the comparison and optimization of such equipments; mastered the complete and all working conditions suited comprehensive waste water treatment technologies for Iron & Steel Plant of which plenty were patented and applied into projects.

技术特点 Technical Features

- ◎ 采用具有混凝、澄清、污泥浓缩、泥渣回流等综合功能的一体化构筑物
- ◎ 特殊的混凝、过滤池型结构，表面负荷高、过滤速度快
- ◎ 在高效澄清池后增设改进型的后混凝及pH调节池
- ◎ 深度处理可采用UF+RO双膜法工艺
- ◎ 自动化程度高、处理效果好、运行成本低
- ◎ Application of the integrated structures with comprehensive functions such as coagulation, clarification, sludge concentration and mud back-flow etc.
- ◎ Special shape and structure for coagulating filter with high surface load and fast filtering rate
- ◎ Additional installation of the improved post coagulation and pH regulating pond after the Highly Effective Clarification Pond
- ◎ Application of UF+RO double film technique to realize the deep treatment
- ◎ High automation, divine effect, low operation cost



高效澄清池结构示意图
Structure Sketch of High-efficiency Clarifier

- | | |
|---------|---------------------------------|
| 1-混合反应区 | 1-Mixing and Reaction Zone |
| 2-絮凝反应区 | 2-Floculating Reaction Zone |
| 3-推流过度区 | 3-Piston Flow Transition Zone |
| 4-斜管分离区 | 4-Inclined Tube Separation Zone |
| 5-后混凝区 | 5-Post Coagulating Zone |
| 6-污泥浓缩区 | 6-Sludge Concentration Zone |
| 7-污泥外循环 | 7-Sludge External Circulation |

专利技术 Patents

一种钢铁污水混凝沉淀及过滤处理系统（发明专利，专利号200510132255.4）
该系统包括高效澄清池和V型滤池。高效澄清池集反应、澄清、浓缩为一体；滤池集过滤、反洗为一体，分为配水区、过滤区、反洗区、清水区。该系统克服了传统混凝沉淀池混凝沉淀效果不理想的弱点；解决了普通快滤池控制手段有限、反洗不充分，移动罩滤池的罩、池间密封不严、设备腐蚀严重、运行成本高等问题。

The treatment system for coagulating, precipitating and filtering of iron & steel waste water (invention patent, patent No. 200510132255.4)

The system includes high-efficiency clarifier and V-shape filter. The former is integrated with reacting, clarifying and concentrating functions; the latter is divided into water distribution zone, filter zone, back wash zone and clear water zone with filtering and back washing functions. The system conquered many problems, among which is poor performance of coagulating and precipitating effect of traditional concentrating and precipitating pond, limited control measures and inadequate back wash of common fast filter and the untight seal between the cover and the pond of the filter with removable cover, severe corrosion of device and high operation cost.

应用业绩 Application Achievements

序号 No.	项目名称 Project Name	服务方式 Way of Service	完成时间 Completion Time
1	首钢污水处理厂 Shougang Waste Water Treatment Plant	总承包 EPC	2002
2	首钢迁钢污水处理厂 Shougang Qiangang Waste Water Treatment Plant	设计 Engineering	2004
3	酒钢污水处理厂 JISCO Waste Water Treatment Plant	设计 Engineering	2009
4	通钢污水处理厂 Tonggang Waste Water Treatment Plan	设备成套 Integration of equipment	2011



高效澄清池
High-efficiency Clarifier



高效澄清池出水
Water Discharged by High-efficiency Clarifier

典型工程：首钢污水处理厂 Typical Project: Shougang Waste Water Treatment Plant

服务方式 Way of Service	工程总承包	EPC
完成时间 Completion Time	2002	2002
系统特点 System Features	- 国内钢铁行业首个应用最先进物化工艺的污水处理工程 30%排水经处理后达到《北京市水污染物排放标准》中的二级标准，即将排水中的F⁻、COD、SS、油等主要不合格项经处理后达标；70%排水经深度处理后回用于工业生产，相应减少新水量2800m³/h，维持首钢内部最佳水平衡	- The first and most advanced physiochemical process waste water treatment project adopted and applied in domestic iron and steel industry 30% of processed drainage water can reach the level II standard of Beijing Effluent Standard of Water Pollutants, namely the main disqualified items F⁻, COD, SS, oil etc. shall reach the standard after treatment; the rest 70% drainage water shall be put back to industry production after deep treatment, thus reducing fresh water 2800m³/h, maintaining the best water balance of Shougang
运行情况 Performance	自投产以来，运行良好，排水指标全部优于设计值	Since it was put into production, the plant operates smoothly, and the drainage indexes all excel the design targets
获奖情况 Awards	冶金行业部级优秀工程设计二等奖 首钢科学技术二等奖	Second Prize of Ministerial Level Excellent Project Design in Metallurgical Industry Second Prize of Shougang Science and Technology

焦化污水处理技术

Treatment Technology for Coking Waste Water

首钢国际工程公司致力于焦化污水处理工艺流程的技术改进和装备开发，掌握了完整的工艺参数并成功应用在多个项目中。

BSIET devoted to the technological improvement and equipment development of coking waste water treatment process flow, and mastered the complete process parameters which had successfully been applied in many projects.

技术特点 Technical Features

- ◎ 完善的预处理系统：重力除油和气浮除油
- ◎ 根据污水特点采用A/O、A/O/O、O/A/O和A/O/A/O生化单元
- ◎ 选用效率高、性能稳定的专用水处理工艺及设备，分别降低COD、F⁻、油、NH₄-N、CN⁻等有害物质
- ◎ 采用混凝-沉淀、陶粒过滤深度处理装置，进一步脱除生化反应难以降解的COD等有害物质，确保处理后的水达到国家排放标准
- ◎ Perfect pre-process system: gravity deoiling and air-float deoiling
- ◎ Application of A/O, A/O/O, O/A/O and A/O/A/O biochemical units based on waste water features
- ◎ Selection of highly effective, stable functioned professional water treatment process and equipment, respective reduction of harmful substances, such as COD, F⁻, Oil, NH₄-N and CN⁻ and so on
- ◎ Application of the deep treatment device of coagulation, concentration and ceramsite filtering to further eliminate the harmful substances like COD which are hard to be degraded by biochemical reactions, thus ensuring the processed water reach National Effluent Standard

专利技术 Patents

一种焦化废水生物脱氮处理工艺（发明专利，专利号ZL200910081141.X）

该工艺在短程硝化—反硝化生物脱氮工艺之后再增加二级缺氧/好氧处理，可以使焦化废水在二级缺氧池内进行水解酸化、精脱氮处理，在二级好氧池内实现完全硝化反应。系统抗冲击负荷的能力加强，出水水质更加稳定，脱氮率更高，二次沉淀池出水的COD_{Cr}和NH₃-N等水质指标可以同时达到《污水综合排放标准》（GB8978-1996）中的一级排放标准。

The biological denitrification process for coking waste water (invention patent, Patent No. ZL200910081141.X)

This process added the level II anoxic/oxic process after the biological denitrification with short-range nitrification and denitration, making the hydrolysis, acidation and refined denitrification of coking waste water



焦化污水处理厂
Coking Waste Water Treatment



焦化污水处理生化池
Biochemical Pond for Coking Waste Water Treatment

applicable in the level II anoxic pond and complete nitrification reaction in the level II oxic pond. Consequently, the system has the capability of resisting more impact load and producing more stable water with higher denitrification rate and the COD_{Cr} and NH₃-N contained in the emission water of second filter can reach the level I effluent standard of Comprehensive Waste Water Effluent Standard(GB8978-1996).

应用业绩 Application Achievements

序号 No.	项目名称 Project Name	工艺类型 Process Pattern	服务方式 Way of Service	完成时间 Completion Time
1	首钢焦化污水处理厂 Shougang Coking Waste Water Treatment Plant	A/O/O工艺 A/O/O Process	总承包 EPC	2001
2	迁安中化煤化工焦化污水处理厂（一期、二期） Coking Waste Water Treatment Plant of Qianan Zhonghua Coal Chemical Co., Ltd. (First Phase, Second Phase)	A/O/O工艺 A/O/O Process	设计 Engineering	2003
3	河北普阳焦化污水处理厂 Puyang Coking Waste Water Treatment Plant of Hebei Province	A/O/A/O工艺 A/O/A/O Process	设计 Engineering	2007
4	印度布山公司焦化污水处理厂 Coking Waste Water Treatment Plant for Indian Bhushan Steel Ltd.	A/O工艺 A/O Process	设计 Engineering	2007
5	迁安中化煤化工焦化污水处理厂（三期） Coking Waste Water Treatment Plant of Qianan Zhonghua Coal Chemical Co., Ltd. (Third Phase)	O/A/O工艺 O/A/O Process	设计 Engineering	2009

典型工程：首钢焦化污水处理厂 Typical Project: Shougang Coking Waste Water Treatment Plant

服务方式 Way of Service	工程总承包	EPC
完成时间 Completion Time	2001	2001
系统特点 System Features	◎ 国内首个完整的短流程硝化—反硝化脱氮法处理高有机物、高氨氮污水的A/O/O焦化污水处理工程 ◎ 工艺先进、成熟、可靠，处理规模4320吨/天，确保处理出水达标排放	◎ The first domestic Coking Waste Water Treatment Project which utilizes the short flowsheet nitrification-denitrification to process the high organics and high ammonia and nitrogen contained water ◎ Advanced, mature and reliable process with capacity 4320 tons/day to ensure attainment of standard emission water after treatment
运行情况 Performance	自投产以来，运行良好，排水指标达到《北京市排入地表水体及其汇水范围的水污染物排放标准》（二级标准）	Since commissioning, the plant operates smoothly and its drainage water reaches the requirements of The Effluent Standard for Water Pollutants Discharged to Surface Water and Its Related Water Regions(level II)

焦化污水处理辐流式沉淀池
Radial-flow sedimentation pond for Coking Waste Water Treatment

污水深度处理技术

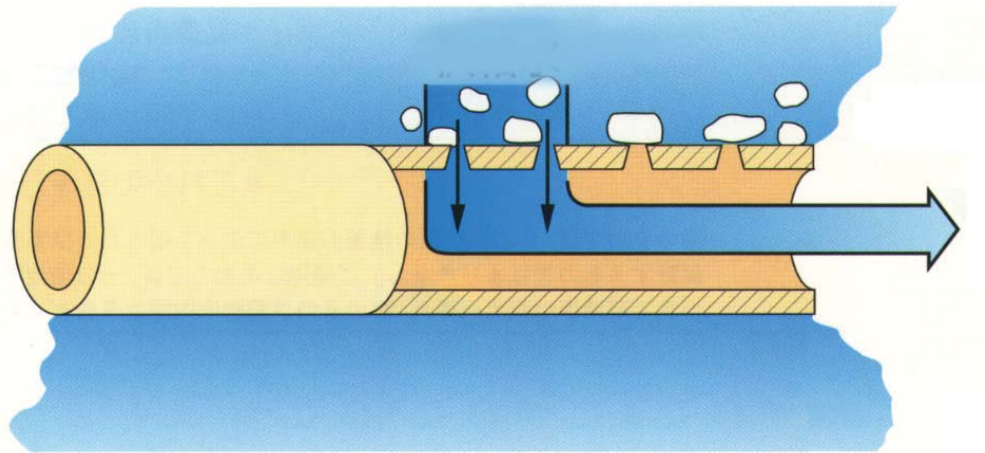
Deep Treatment Technology for Waste Water

在综合污水处理实践经验的基础上，首钢国际工程公司通过污水深度处理试验、总结与优化，形成了具有突出技术优势的污水深度处理工艺，拥有成功的应用业绩。

On the basis of practical experience on comprehensive sewage treatment system, BSIET has owned the deep treatment technology of waste water with remarkable technical advantages by test, summing up and optimization on deep treatment of waste water, which had successfully been applied in many projects.

技术特点 Technical Features

- ◎ 根据不同来水，采用“双膜法”、“多介质过滤+双膜法”等多种工艺组合
- ◎ 技术流程简洁高效，自动化程度高，处理效果好
- ◎ Based on the input water characteristics, various combined process are applied, including “Double Membrane Process” and “Multi-medium Filtration Technology + Double Membrane Process”
- ◎ Succinct and highly effective technology flow with high automation, divine process effect



脱盐膜结构示意图
Film Structure Diagram of Desalination

专有技术 Exclusive Technology

通过合理的膜通量选择和最优的设施配置，使整个系统产水稳定、反洗周期长、产水水质好、耗能低、操作简便。

By reasonable selection of membrane flux and optimal facility configuration, we make the system featured with stable and good quality water production, long period back wash, low energy consumption and simple operation.

应用业绩 Application Achievements

序号 No.	项目名称 Project Name	服务方式 Way of Service	完成时间 Completion Time
1	首钢污水处理厂深度处理 Deep Treatment of Shougang Waste Water Treatment Plant	设计 Engineering	2005
2	首钢迁钢中水脱盐车站 Shougang Qiangang Reclaimed Water Desalination Station	设备成套 Integration of equipment	2009
3	首钢迁钢冷轧废水深度处理 Deep Treatment of Shougang Qiangang Cold Rolling Waste Water	总承包 EPC	2010



污水深度处理超滤膜组件
Ultrafiltration Membrane Components for Deep Waste Water Treatment



污水深度处理除盐膜组件
Salts Removal Components for Deep Waste Water Treatment

典型工程：首钢迁钢中水脱盐车站 Typical Project: Shougang Qiangang Reclaimed-water Desalination Station

服务方式 Way of Service	设备成套	Integration of equipment
完成时间 Completion Time	2009	2009
系统特点 System Features	◎ 采用多介质过滤 + 超滤+反渗透双膜法处理工艺，产水规模为1000m³/h ◎ 原水采用迁钢综合污水处理厂处理合格后的出水，脱盐车站成品水供给迁钢高端水质用户补充使用	◎ Adopt the comprehensive process including multi-medium filtering, ultrafiltration and reverse osmosis double membrane technology making the water production 1000m³/h ◎ Take the qualified drainage water of Qiangang Comprehensive Waste Water Treatment Plant as raw water; processed desalinated water shall be provided to high quality water needed users for additional use
运行情况 Performance	自投产以来，系统运行良好，产水水质及水量稳定。减少工业新水的使用，实现了钢铁厂污水的资源化和零排放	Since commissioning, the system operates smoothly with stable water quality and production. Fresh water for plants is reduced, and waste water of iron and steel plants is recycled for use and none was discharged

低温多效海水淡化技术

Low temperature multi-effect sea water desalination technology

海水淡化是一种能够充分利用各种余热资源和乏汽资源、创新性的节能减排技术，淡化后的合格产水作为优质水用户的补充水。首钢国际工程公司设计并设备成套了我国钢铁企业的第一套海水淡化装置，在自主设计与技术研发方面走在行业前列。

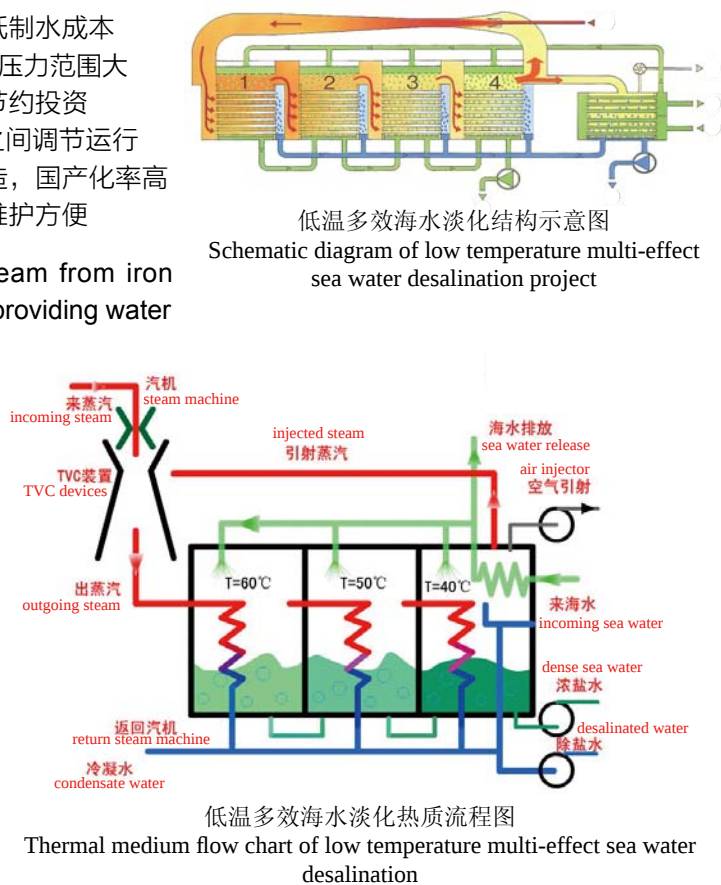
首钢国际工程公司可根据工厂蒸汽平衡和各除盐水用户的不同需求，提供海水取水、海水预处理、淡化主体、成品水储配等全流程的技术服务。可根据客户的不同边界条件，确定海水淡化主体设施最优运行参数和主要工况；可单独设置低温多效装置或采用低温多效装置与汽轮机及其它低低压气源组合，直接利用该低温低压蒸汽进行海水淡化。

Sea water desalination technology makes full use of various waste heat and dead steam realizing innovatively the goal to save energy and reduce emission. Qualified desalinated water shall be used as the makeup water for quality water user. BSIET has designed and provided the integrated equipment for the first set of sea water desalination project in iron & steel industry, making BSIET ranking in the leading position of this industry both in independent design and technology innovation.

BSIET can provide all-round services from sea water in-take, sea water pre-desalination, main desalination to product water storage and distribution according to the steam balance of iron & steel plant and different requirement of each desalination users. We can also set up the best running parameter and operating conditions of the main sea water desalination equipment according to customers' different the operational boundary condition of sea water desalination main facility. We can solely set the low temperature multi-effects device or integrate it with turbine-generator or other low pressure steam sources, conducting sea water desalination directly by low temperature and low pressure steam from turbine-generator.

技术特点 Technical Features

- ◎ 采用钢铁厂富余蒸汽进行海水淡化，有效降低制水成本
 - ◎ 双TVC，系统可在三种工况下运行，利用蒸汽压力范围大
 - ◎ 合理的效数选择既保证充足的造水比，还可节约投资
 - ◎ 辅助设施配置可保证系统负荷在50%-100%之间调节运行
 - ◎ 最大程度选用国产设备及材料，自主加工制造，国产化率高
 - ◎ 产水水质及水量稳定，自动化程度高，运行维护方便
-
- ◎ Make full use of waste heat and dead steam from iron & steel plant, effectively reduced the cost of providing water
 - ◎ Double TVC system can work under three different conditions, thus expanding the scope of steam pressure
 - ◎ Reasonable choice of running parameters lower the cost of water as well as save the investment
 - ◎ Utility devices can make sure the system run smoothly under the load of 50%-100%
 - ◎ Use domestic devices and materials to the largest degree with independent manufacture and fabrication, reaching a high rate of homemaking
 - ◎ The product water is superior in quality and stable with a high rate of automation and convenient maintenance



专利技术 Patents

利用低温低压蒸汽进行海水淡化的工艺（发明专利，专利号200810103167.5）

该工艺采用低温多效装置与汽轮机及其它低低压气源组合，直接利用该低温低压蒸汽进行海水淡化，大幅降低运行成本和设备投资。

Sea water desalination process by using low temperature and pressure steams (invention patent, Patent No.200810103167.5)

This process integrates low temperature multi-effects device with turbine-generator and other low pressure steam sources, conducting sea water desalination directly by using low temperature and low pressure steam from turbine-generator and effectively reducing the running cost and devices investment.

应用业绩 Application Achievements

序号 No.	项目名称 Project Name	服务方式 Way of Service	完成时间 Completion Time
1	首钢京唐海水淡化（一期一步） Shougang Jingtang sea water desalination project (1 st step of Phase 1)	设计 Engineering	2008
2	首钢京唐海水淡化（一期二步） Shougang Jingtang sea water desalination project (2 nd step of Phase 1)	设计、设备成套 Engineering and integration of equipment	2010





海水预处理循环砂泵房
Sea water pre-desalination circular sand pump house



低温多效海水淡化辅助设施
Auxiliary devices for low temperature multi-effect sea water desalination project



低温多效海水淡化主体装置俯瞰
Low temperature multi-effect sea water desalination main devices overlook



低温多效海水淡化主体装置夜景
Low temperature multi-effect sea water desalination main devices night scene



低温多效海水淡化主体装置亮相国家科技成果展
Low temperature multi-effect sea water desalination technology on national technology achievement exhibition

典型工程：首钢京唐海水淡化厂（一期）
Typical project: Shougang Jingtang sea water desalination plant (phrase 1)

服务方式 Way of Service	设计、设备成套	Engineering and integration of equipment
完成时间 Completion Time	2010	2010
系统特点 System Features	- 一期规模50000t/d，分两步建设，每步建设海水淡化装置2套，单套日产水能力12500吨，为当时国内最大规模 - 采用低温多效海水淡化技术，装置分7效，纯TVC模式下造水比为9.8 - 产品水电导率$\leq 10\mu\text{S/cm}$	- Phrase 1 scale 50000t/d, construction is divided into 2 steps, 2 sets of sea water desalination devices are built each step. Each set can produce 12500t water per day, which is the largest scale in china that time - Application of the low temperature multi-effect sea water desalination technology, the devices are divided into 7 kinds; the rate of water production can reach 98% under the TVC mode - The product conductivity$\leq 10\mu\text{S/cm}$
运行情况 Performance	自投产以来，运行良好，产水指标全部达到设计值	Run safely and steadily by now, the produced water criteria reached the designed target
获奖情况 Awards	冶金行业全国优秀工程设计一等奖 首钢科学技术一等奖	First Prize of Ministerial Excellent Project Design in Metallurgical Industry First Prize of Shougang science & technology



钢铁厂各工序水处理技术

Water treatment technology for each procedure of iron and steel plant

多年来，首钢国际工程公司积极贯彻国家节能减排的方针，致力于钢铁厂各工序水处理技术的研发与应用，以节约水资源和减少污染物外排为宗旨，注重系统观和全局观，综合考虑外部条件和内部接口，合理配置给排水工艺流程。

为更好地与各工序工艺配套，将供水系统和水处理系统优化、合并，在确保工序指标需求的前提下，通过技术经济比较和总图优化布置，使原本分散的供水系统变得简明并易于集中管理，提高专业化管理水平。

在对国外先进工艺、设备引进消化的基础上，首钢国际工程公司形成了一系列具有自主知识产权的专有技术和优势技术。

For many years, BSIET has been echoing the state's policy of energy saving and emission reduction and devoted itself to the research and development of various working procedure on water treatment technology in iron & steel plant with saving the water resource and reducing pollutant emission as its tenet. BSIET also pays great attention to system and overall situation and comprehensively considers outside factors and inside interface, then rationally configures the process flow of water supply and drainage system.

In order to match different working procedure, BSIET optimized and integrated the water supply system and water treatment system. It simplifies and centralizes the water supply system which was dispersed before by technical economical comparison and optimization arrangement of the general layout, and it has upgraded the specialized management level.

On the base of introduction and digestion of overseas advanced technology and devices, BSIET has gained a series of special technology and advantage technology with independent intellectual property rights.

钢铁厂厂区一角
A corner of iron & steel plant



高炉闭路循环软水冷却工艺技术

Closed loop circulating demineralized water cooling technology for blast furnace

在传统的高炉闭路循环软水冷却工艺的基础上，首钢国际工程公司自主研发了新型冷却工艺，该工艺将开路工业净循环回水串接作为闭路循环软水系统中板式换热器的冷媒水，能够显著提高冷却水利用率、改善高炉冷却效果、延长高炉使用寿命，并具有安全可靠、管理简捷、运行费用低的特点。

首钢迁钢公司给排水系统工艺研究与创新荣获冶金科技进步三等奖。

Based on conventional closed loop circulating demineralized water cooling technology for blast furnace, BSIET has independently developed a new cooling technology. The new technology is to use the industrial indirect return water from open loop through serial connection as the chilling water for closed loop circulating demineralized water cooling plate heat exchanger, which can greatly intensify cooling water availability, improve BF cooling effect, prolong BF campaign and has the characteristics of safety and reliability, easy management and low operation cost.

The research and innovation of Shougang Qiangang corporation water supply and drainage system process has earned 3rd Prize of metallurgical science progress.



高炉闭路循环板式换热器布置
Arrangement of BF closed loop circulating cooling plate heat exchanger



换热器局部
Part of heat exchanger

应用业绩 Application Achievements

序号 No.	项目名称 Project Name	服务方式 Way of Service	完成时间 Completion Time
1	首秦炼铁厂高炉冷却水系统 BF cooling water system of Shouqin Iron-making Plant	设计 Engineering	2005
2	首钢迁钢炼铁厂高炉冷却水系统 BF cooling water system of Shougang Qiangang Iron-making Plant	设计 Engineering	2006
3	首钢京唐炼铁厂高炉冷却水系统 BF cooling water system of Shougang Jingtang Iron-making Plant	设计 Engineering	2008

热轧油环污水处理技术
Contact water treatment system for hot rolling mill

在热轧污水处理方面，首钢国际工程公司拥有先进的稀土磁盘净化处理技术和“热轧油环废水处理装置”专利技术（专利号200520145275.0），拥有丰富的设计及总承包业绩。首钢高线厂油环系统水质改造工程设计荣获冶金行业部级优秀工程设计三等奖。

- 稀土磁盘净化处理技术流程简单、高效，具有以下显著优势：
从污水源头分流治理，含油污水单独处理，利于废油回收，也减少油环水系统含油量；
稀土磁盘净化处理技术可替代二次沉淀和过滤，改变传统一沉、二沉和过滤的三段流程，节省过滤器反洗排水调节浓缩设施及污泥处理设施；
稀土磁盘强磁力特性具有高效分离作用，其效果远优于靠介质重力分离的自然沉淀，处理效率高，出水水质好。

For waste water treatment on hot rolling mill, BSIET owns advanced technology of rare earth magnetic disc water purification and a patent of “waste contact water treatment system for hot rolling mill” (No.200520145275.0) with abundant application achievements on design and EPC project. Renovation project of direct water treatment water quality for Shougang High-speed Wire-rod Mill Plant was awarded the 3rd Prize of Ministerial Excellent Project Design in Metallurgical Industry.

The technology of rare earth magnetic disc water purification is simple in technical flow and character of high efficiency, the advantages are as follows:

- Control of waste water is started from the head stream, including individual treatment of oily waste water. This is beneficial for waste oil recovery, and also oil content in contacted water system is reduced.
Technology of rare earth magnetic disc water purification treatment can replace secondary settling and filtration, and change conventional primary settling, secondary settling and filtration process flow in order to reduce treatment facilities on regulating and thickening of back washing discharging water and slurry from filter system.
Feature of strong magnetic of rare earth magnetic disc has high efficiency separation action. Its result is higher than that of natural settling on medium gravity separation with good treatment result and better water quality.



热轧油环废水处理稀土磁盘
Rare earth magnetic disc for contact water treatment system for hot rolling mill

应用业绩 Application Achievements

序号 No.	项目名称 Project Name	服务方式 Way of Service	完成时间 Completion Time
1	首钢第一线材工程油环水处理 Direct water treatment of Shougang 1# Wire Rod Rolling Mill	设计 Engineering	2005
2	昆钢红河棒材工程油环水处理 Direct water treatment of Kungang Honghe Bar Mill	设计 Engineering	2008
3	首钢京唐2250mm热轧工程油环水处理 Direct water treatment of Shougang Jingtang 2250mm Hot Strip Mill	设计 Engineering	2008
4	首钢迁钢1580mm热轧工程油环水处理 Direct water treatment of Shougang Qiangang 1580mm Hot Strip Mill	设计 Engineering	2009
5	首钢京唐1580mm热轧工程油环水处理 Direct water treatment of Shougang Jingtang 1580mm Hot Strip Mill	设计 Engineering	2010

热轧含油废水处理技术
Oily waste water treatment for hot rolling mill

首钢国际工程公司自主研发了高效、环保的含油废水处理装置，采用高效旋流一体化多功能分离器对来水进行预处理，然后通过配有溶气泵回流的二级高效串联气浮除油装置，对油水进一步分离处理。该技术具有自动化程度高、分类分离效率和回收利用率高、操作环境优良等特点，是钢铁行业传统含油废水处理工艺的重大改进。

BSIET has independently developed a complete set of high efficient and environment friendly oily waste water treatment facility, which adopts the high-efficient cyclone multi-effect separator for water pre-treatment and then uses second degree efficient and series air-floating oil eliminator with air-handling pump for return for further oil and water separation. This technology has characteristics of high automation level, high efficiency of separation and recycle, good operation environment, etc., so it is a big improvement for the traditional oily waste water treatment process in the iron & steel industry.

专利技术 Patents

- 钢铁厂热轧高含油废水处理、回用方法（发明专利，专利号201010264339.4）
热轧高含油废水处理的多功能油渣水分离器（实用新型，专利号201020506839.X）
热轧高含油废水处理的高效除油分离装置（实用新型，专利号201020506917.6）
Oily waste water treatment and recycle for hot rolling mill in iron & steel plant (invention,No.201010264339.4)
Multi-function oil-slag-water separator for high oily waste water treatment of hot rolling mill (new utility model, patent No.201020506739.X)
High efficient oil separator for high oily waste water treatment of hot rolling mill (new utility model, patent No.201020506917.6)



热轧含油废水一体化分离器
Integrated separator for hot mill oily waste water

应用业绩 Application Achievements

序号 No.	项目名称 Project Name	服务方式 Way of Service	完成时间 Completion Time
1	首钢迁钢1580mm热轧含油废水处理 Oily waste water treatment of Shougang Qiangang 1580mm Hot Strip Mill	设备成套 Integration of equipment	2010
2	首钢京唐1580mm热轧含油废水处理 Oily waste water treatment of Shougang Jingtang 1580mm Hot Strip Mill	设备成套 Integration of equipment	2010

冷轧含酸含碱含油废水处理技术
Acid, alkali, oily waste water treatment for cold rolling mill

首钢国际工程公司致力于冷轧含酸含碱含油废水处理技术的研发与应用，结合多年的工程经验，将传统处理构筑物重新组合并适当简化，缩短处理流程，形成了集中、高效的短流程处理技术，为冷轧企业废水达标排放乃至“零”排放提供了技术支持。

BSIET dedicates to research and application of new technology on acid, alkali, oil bearing waste water treatment for cold rolling mill. Based on years of project experience, BSIET recombined and simplified the traditional treatment application, shortened the process flow, thus created a centralized, high efficient short flow treatment process, which provided technical support for the standard or even zero discharge of waste water from cold rolling mill.

应用业绩 Application Achievements

序号 No.	项目名称 Project Name	服务方式 Way of Service	完成时间 Completion Time
1	首钢特钢冷轧厂废水处理站 Waste water treatment station of Cold Rolling Mill of Shougang Special Steel	设计 Engineering	2004
2	首钢顺义冷轧厂废水处理站 Waste water treatment station of Shougang Shunyi Cold Rolling Mill	设计 Engineering	2007
3	首钢迁钢冷轧厂废水处理站 Waste water treatment station of Shougang Qiangang Cold Rolling Mill	设计 Engineering	2011



冷轧含油废水调节池
Regulating pond for oily waste water from cold rolling mill



冷轧含油废水超滤布置
Arrangement of ultra filter for oily waste water from cold rolling mill

多工序集中供水技术
Centralized water supply for multi- procedure

首钢国际工程公司开创性地将钢铁厂中烧结、炼铁、炼钢、连铸等工序的供水系统合并，通过合理的总图布置，使原有复杂的供水系统变得简明和易于管理。同时，通过提高专业化管理，加强水稳措施，适当提高循环水浓缩倍数，实行串联用水和一水多用，实现全厂废水的回收利用，形成了高效循环、节能环保、节省占地的新型钢铁联合企业给排水系统。

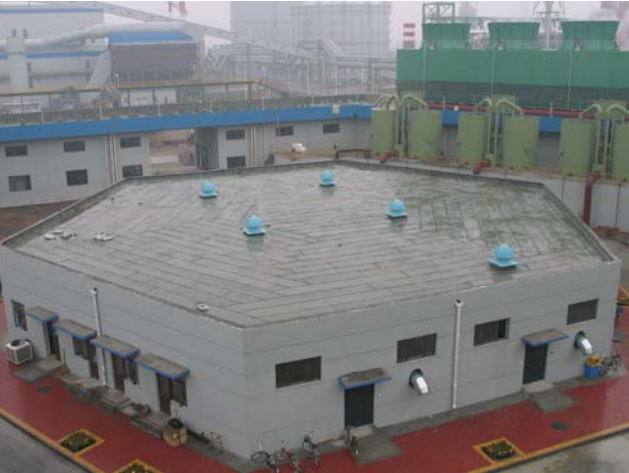
首钢国际工程公司设计的迁钢三期配套完善综合水处理中心是目前国内钢铁行业最大的综合性集中水处理设施。

BSIET creatively integrated water supply system for each procedure in an iron & steel plant such as sintering, iron making, steel making and continuous casting through reasonable distribution layout, which made the originally complex water supply system more simple and easy to manage. At the same time, through improving the professional management level, enhancing the stability of water supply, increasing the concentration ratio, applying cascade water use and multiple use of water, realizing waste water recycle of the whole plant, BSIET created a high efficient, recycled, energy saving, environmentally friendly, land saving water supply system for new mode iron & steel corporation.

BSIET designed the comprehensive water treatment center for the Qiangang Phase 3 of utility supply project, which is the largest comprehensive water treatment facility in iron and steel industry in China.

应用业绩 Application Achievements

序号 No.	项目名称 Project Name	服务方式 Way of Service	完成时间 Completion Time
1	首秦集中水处理设施 Shouqin centralized water treatment facility	设计 Engineering	2005
2	首钢迁钢集中水处理设施 Shougang Qiangang centralized water treatment facility	设计 Engineering	2008



六角形集中水处理设施
Hexagonal centralized water treatment facility



冷却塔及事故供水塔
Cooling tower and emergency water supply tower



椭圆形集中水处理设施
Elliptic centralized water treatment facility

钢铁厂分质供水与排水分类回收技术
Classified water supply and classified recovery of drainage water for iron and steel plant

首钢国际工程公司以“零”排放为目标，规划钢铁企业供排水体制，创新设计应用了钢铁厂分质供水与排水分类回收技术。该技术根据用户对水质的不同要求，分别设置生产消防水、除盐水、回用水和再生水供水系统；根据排水水质和回用水用户的不同要求，分别设置高含盐水、生产排水、焦化排水和雨排水系统，从而充分利用水资源，降低各工序的新水消耗。

BSIET sets “ZERO” discharge as its goal while designing water supply and drainage system for iron & steel plant, so it creatively designed and applied the technology of classified water supply and classified recovery of drainage water for iron and steel plant. Based on the different requirements on water quality by each user, industrial water, desalinated water, reclaimed water and regenerated water supply systems are provided respectively. Based on different quality of drainage water and the requirements of users of reclaimed water, high salinity water, production drainage water, coking drainage water and rain water drainage systems are provided respectively, so that this system makes full use of water resource and lower the water consumption by each procedure.

应用业绩 Application Achievements

Table with 4 columns: 序号 No., 项目名称 Project Name, 服务方式 Way of Service, 完成时间 Completion Time. It lists three projects: Shouqin water supply and drainage system (2005), Shougang Qiangang water supply and drainage system (2008), and Shougang Jingtang water supply and drainage system (2010).



钢铁厂分质供水
Classified water supply for iron & steel plant

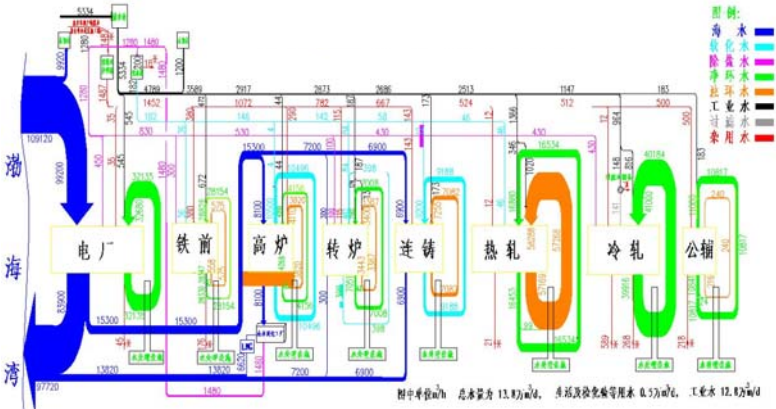
钢铁厂给排水综合管网优化技术
Integrated pipe network optimization for water supply and drainage of iron & steel plant

以钢铁厂分质供水与分类回收为基础，结合钢铁厂不同用户的特征，以用户安全、投资节省、使用高效为原则，开展给水管网与排水管网的优化设计。通过管网平差计算，设置“环状”与“支状”相结合的给水管网，并可实现不同水质给水系统的在线计量及水质监控；通过确定不同的排水体制及水力高程计算，设置合理的排水管网。另外，可结合不同钢铁厂的具体情况，通过技术经济比较确定不同的给排水管材。

BSIET sets a foundation of quality-classified supply and classified recycle of water, a principle of safety, investment saving, efficient performance for the clients while optimally designing water supply and drainage pipe network system according to the different characteristics of different iron& steel plants. According to error compensation calculation of the pipe network, “loop” and “branch” pipe networks are combined for water supply. Real time measurement and quality surveillance in different quality water supply pipe networks are also accessible; set rational water drainage pipe networks according to different drainage system and height difference. Pipe network material can also be decided by technological economical comparison according to specific conditions of different iron & steel plant.



能源中心给排水管网计量与监控
Measurement and monitor system of water supply and drainage pipe network in the energy center



首钢京唐水系统平衡图
Shougang Jingtang water balance system

应用业绩 Application Achievements

Table with 4 columns: 序号 No., 项目名称 Project Name, 服务方式 Way of Service, 完成时间 Completion Time. It lists three projects: Shouqin integrated pipe network for water supply and drainage (2005), Shougang Qiangang integrated pipe network for water supply and drainage (2008), and Shougang Jingtang integrated pipe network for water supply and drainage (2010).

市政给水及排水技术

Municipal water supply and drainage technology

首钢国际工程公司能够提供各类市政给水和排水工程的咨询、设计、设备供货及总承包等技术服务，包括河道取水、地表水处理、深井取水及处理配送、二次加压泵站、城市供水管网、城市污水处理、污水提升泵站、城市排水管网等。

首钢国际工程公司具有高效混凝沉淀及V型过滤、机械搅拌混凝沉淀及普通快滤等给水处理技术及SBR（CAST、CASS、MSBR）、A-A-O、氧化沟等污水处理技术，可满足不同客户的个性化需求。

BSIET has the capability to do such works as consulation, design, equipment supply and general contract project etc for various municipal water supply and drainage project. It can also provide services such as taking water from rivers, treatment for surface water, taking water from deep well as well as treatment and distribution, booster station, urban water supply pipe network, urban waste water treatment, waste water lift pump station, municipal sewer system, etc.

BSIET has the technology of high efficient coagulation & sediment and V type filtration, mechanic coagulation & sediment and ordinary quick filtration for water treatment. It also has the technology of SBR (CAST, CASS, and MSBR), A-A-O, oxidation ditch etc for waste water treatment, which can satisfy individualized requirement from different clients.



给水处理澄清池
Clarification pond for water supply

应用业绩 Application Achievement

序号 No.	项目名称 Project Name	服务方式 Way of Service	完成时间 Completion Time
1	首钢京唐给水厂 Shougang Jingtang water supply plant	总承包 EPC	2008
2	广东怀集污水处理厂 Guangdong Huaiji waste water treatment plant	设计 Engineering	2011



污水处理氧化沟
Oxidation ditch for waste water treatment



污水处理二沉池
Secondary sedimentation tank for waste water treatment



污水处理SBR池
SBR pond for waste water treatment