CISDI GROUP CO., LTD.

CISDI HEADQUARTERS
Add.: 1 Shuanggang Road, Yuzhong District, Chongqing 400013, China
Tel.: +86 23 6354 5622
Email: OB@cisdi.com.cn
Website: www.cisdigroup.com.cn

CISDI UK
Add.: CISDI HOUSE, 8 Furnival Rd, Sheffield, S4 7YA, UK
Tel.: +44 1142291067
Email: info@cisdi.co.uk
Website: www.cisdi.co.uk

CISDI Turkey
Add.:122,A3 Blok,Mashattan, MASLAK MAHALLESI, Istanbul, Turkey
Tel.:+90-6340137287
Email:jing.zhang@cisdi.com.cn

CISDI India
Add.: 503-504, 5th Floor, A-Wing, Galleria Building, Hiranandani Gardens, Powai, Mumbai 400076, India
Tel.: +91-9702043402 +91 22-49701004
Email: yong.liu@cisdi.com.cn

CISDI Malaysia
Add.: 5-9-6 Corinthian Condomonium, Jalan Binjai, 50450 Kuala Lumpur, Malaysia
Tel.: +60 165626758 / +86 13508339926
Email: Shihong.Ma@cisdi.com.cn

CISDI USA
Add.: One PPG Place, Suite 3100, Pittsburgh, PA 15222, USA
Tel.: +44 (0)114 229 1067
Email: info@cisdiusa.com
Website: www.cisdiusa.com

CISDI Brazil
Add.: Rua Pernambuco 1002, Sala 902, Bairro Funcionarios, Belo Horizonte, CEP 30.130151, Minas Gerais, Brasil
Tel.: +55 31 34638880
Email: xin.yan@cisdi.com.cn

CISDI Vietnam
Add.: Phòng 2108 tòa nhà Charmvit Tower số 117 đường Trần Duy Hưng, Phường Trung Hòa, Quận Cầu Giấy, Thành phố Hà Nội, Việt Nam
Tel.: +84 0 2432007795 / +84 943482089
Email: xinbin.liu@cisdi.com.cn

Published By CISDI Corporate Culture Department

CISDI NEWSLETTER

Issue 2: February 2021

IN THIS ISSUE

- Masteel's iron 'Super Brain' takes the spotlight
- Jinxi Steel's state-of-the-art 3-strand slab caster achieved In record time
- Baowu Zhanjiang's world-leading CCM is up and running
- Baowu Zhanjiang's Phase II RHF is home and dry
- CISDI's super-fast mill is a success at Ningxia Jianlong

CISDI

Technology and Solutions Partner for the Global Metals Industry

FULL-PROCESS SERVICES

CISDI provides full-process services from the bulk material handling yard to the final post-processing line of rolling mill.

FULL-FUNCTION SERVICES

CISDI provides standard and customized consulting, execution, and operations management services.

FULL-LIFE-CYCLE SERVICES

CISDI provides the FEED (front-end engineering & design), implementation, and production and operations management services throughout the entire project life cycle and provides continuous after care services and support.

TABLE OF CONTENTS

News

Masteel's iron 'Super Brain' takes the spotlight 02

Events

Jinxi Steel's state-of-the-art 3-strand slab caster achieved In record time 06

Xusteel brings two long products rolling lines on-stream 08

Baowu Zhanjiang's world-leading CCM is up and running 10

Masteel's blast furnace is going green 11

Orders for CISDI's green, smart mills roll in 11

Switch-on for Smart Substation 12

CISDI builds Ansteel's latest IT solution 13

Baowu Zhanjiang's Phase II RHF is home and dry 14

CISDI to build centralised control centre for Zenith 15

S&T

CISDI's super-fast mill is a success at Ningxia Jianlong 16

Masteel's iron 'Super Brain' takes the spotlight

China's most advanced centralised control system for pan-ironmaking took centre-stage at Baowu Green Development's recent Intelligent Manufacturing Conference.

The conference, held at Masteel in Maanshan City based in China's Anhui Province, was given a special report and demonstration on the success of the CISDI-developed 'Super Brain.'

Masteel's Intelligent Pan-ironmaking Control Centre has the CISDI Shuitu Cloud Industrial Internet Platform at its core and can integrate over a hundred intelligent applications and big data algorithms.

The state-of-the-art system is capable of controlling more production lines to the largest scale than any other control centre operating in China.

Transformative upgrades driven by digital and intelligence tech mean super-efficient, low-consumption production for Masteel's ironmaking.

Ultra-precise control of mass flow, energy flow and information flow have been achieved from the stockyard through to sintering, coking and ironmaking procedures. Conventional production boundaries have been eradicated from organisation and flow levels and deep integration have been achieved.

Flows inside each production procedure are optimised and flows between procedures are dynamically aligned. All production efficiencies are optimised.

State-of-the-art intelligent manufacturing for China's steel sector

Special steels producer Masteel is part of the Baowu Group and has an annual output of 20 million tonnes.

The new centre gives centralised control of six blast furnaces, six sintering machines, four coke ovens, one traveling grate machine and one stockyard, which are sited across 13.5 square kilometres.

Its control range, line quantity and centralisation levels are the most advanced in China's entire steel sector.

Only 120 duty posts at the centre now require manpower.

Remote control has been achieved across a wide range of production procedures. The workforce has been reduced by more than 200, while productivity has improved by 39 per cent.

The interior of Masteel Intelligent Pan-ironmaking Control Centre

Super brain: transforming Masteel production to digital

The CISDI-built 'Super Brain' for pan-ironmaking production and management has applied over a hundred smart APPs and hundreds of automatic spreadsheets.

It facilitates highly scientific and accurate decision-making - hundreds of thousands of points of data can be collected and utilised to support staff at over 120 posts.

The data is deeply mined and processed to transform production from approximations to digital and intelligent. The result is more refined management, stabler production, higher efficiency and lower costs.

The Masteel project marks the first successful application of dozens of CISDI's intelligent developments for transforming ironmaking production, including:

- Integrated logistics tracking
- Key post information sharing
- Distribution linkage
- Belt conveyor intelligent cycle inspection
- Stockyard visualisation
- Tuyere intelligent diagnosis
- Safe, dynamic replay system of the furnace wall.

Safe, long-distance centralised control is finally achieved

The interior of Masteel Intelligent Pan-ironmaking Control Centre

Night view of the Masteel Intelligent Pan-ironmaking Control Centre

Masteel's intelligent control centre is based outside the steelworks and is the first of its kind.

It has eliminated the need for 46 onsite control pulpits in the pan-ironmaking production area - some of which are 18 kilometres away. Their functions are now controlled by the centre.

The control centre was designed and built by CISDI for China's steel enterprises. CISDI sees its invention as an important achievement in the goal to create a harmonious relationship between the steel sector and the city.

Screens enable staff to monitor and understand first-hand data and status of each procedure. Alarms sound in the event of any anomalies and relevant staff are alerted by messages sent via a Palm Factory APP, which means troubleshooting can be swiftly carried out.

Achieving failsafe long-distance remote control which ensures production security, reliability and stability has long been a battle.

But CISDI's design has integrated over 200 PLC/DCS systems and more than 2,000 monitor displays. They guarantee the centre's power supply, control, network, data, applications and operation safety.

In addition, the centre's intelligent products and methods means operators are freed from long periods of screen-monitoring.

The future is flow-based management

The CISDI Shuitu Cloud Industrial Internet Platform is a trail-blazer setting China's intelligent steel manufacturing alight.

Conventional administrative management structures have dozens of separate hierarchical systems, but the Shuitu Cloud is flow-based and fully integrates production procedures.

A total fusion of technology, production and management is achieved.

Masteel's pan-ironmaking production management flows apply a '1+4+N' collaborative decision-making method:

One intelligent, centralised hub controls four centres - the decision-making centre, production commands centre, operational management centre and the technology integration centre, and also coordinates a number of production procedures.

As a result, operators at separate onsite pulpits can now communicate directly with each other without procedure boundaries. Manpower and costs have been reduced and efficiency has been maximised.

Jinxi Steel's state-of-the-art 3-strand slab caster achieved In record time

-CISDI's innovative tech will bring outstanding results

Jinxi Steel's 3-strand caster goes on stream for ramp-up

A highly innovative 3-strand slab caster has been hot-commissioned at Hebei Jinxi Steel.

This continuous caster will hot-charge its slabs to downstream rolling production.

Its projected annual output will be 2.30 million tonnes of qualified slabs.

CISDI's most advanced tech and products have been applied and represent the latest advancements in China's state-of-the-art continuous casting sector:

- The tundish is equipped with a large-capacity 'dam and weir' to control the flow of liquid steel. As a result, the liquid steel's temperature difference is within four deg. C among the three strands and casting stability and uniform quality are ensured.
- The mould's hydraulic oscillator is operating stably and reliably. No alarm or fault has been reported since the caster's startup.
- The caster has been designed with improved inter-strand service space and an enclosed, isolated system, which gives maintenance workers easier access and thereby extends the service life of critical equipment.
- The fully-enclosed secondary cooling exhaustion system features a large draught and ensures zero steam emission.
- An intelligent transfer car control system has improved travel stability and reliability and reduced manpower requirements.

Thanks to close collaboration and organisation between CISDI and Jinxi Steel, civil work, equipment installation, piping flushing, electrical and automation tests and individual and combined commissioning were completed in 135 days. Practical hot commissioning occurred a week ahead of schedule.

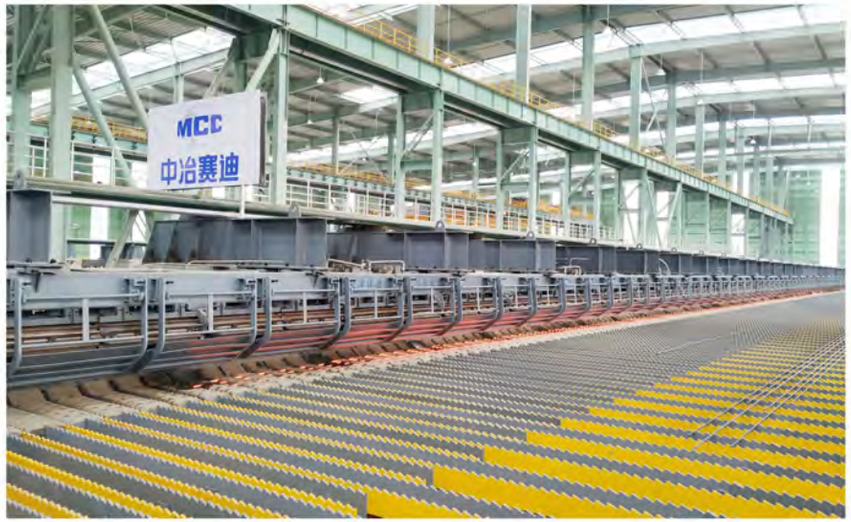
The project was completed in record time for a project of this kind in China.

In a letter of thanks to CISDI, Jinxi commented: 'We are very grateful to CISDI's leadership for prioritising our slab caster project and thank their team for the diligence and intelligence they devoted to every milestone in this project.'

Xusteel brings two long products rolling lines on-stream

- Both dual-high-speed bar rolling lines designed, manufactured and integrated by CISDI are China's most advanced lines of its kind

A hot bar is successfully rolled through the roughing and intermediate mill stands for Xusteel dual-high-speed bar rolling line 2



The rebars at the cooling bed featuring a diameter of 14 millimetres and a rolling speed of 26 metres per second

Great achievements have been made by Xusteel's Phase III technological upgrade programme.

The scheme features two dual-high-speed bar rolling lines. Line 1 was started up at the end of last year and Line 2 has now been operational for a month.

Each state-of-the-art line has an annual production capacity of 1.40 million tonnes.

CISDI built the lines to an EPC mode in the face of huge challenges.

After breaking ground at the site last April, numerous problems were caused by the pandemic.

Unexpected extreme weather conditions caused further disruption. Protracted storms and cold winter temperatures had to be worked around. But CISDI met all contractual milestones and a smooth hot-commissioning was achieved.

The lines feature the following CISDI core process, equipment and control tech:

The CISDI team pictured at Xusteel for hot-commissioning

- ◆ Highly-efficient hot transporting and direct hot charging
- ◆ TMCP and low-temperature rolling
- ◆ NHCD standardised short-stress path rolling mill
- ◆ CDMC standardised high-speed modular mill
- ◆ FSCD standardised flying shear
- ◆ Super-fast bar delivery system

Baowu Zhanjiang's world-leading CCM is up and running

CISDI has designed and supplied a highly automated, safe and cost-effective continuous caster to Baowu Zhanjiang Steel in China's Guangdong Province.

The 2-strand 1,650mm slab caster is now running, and is the first hot-commissioned project at Zhanjiang's flagship Phase II development.

Slab at a specification of 1,600mm x 230mm was selected for hot-commissioning.

A projected annual production capacity of 2.80 million tonnes will enable Zhanjiang's Meltshop to step closer towards its goal of becoming the world's largest single producer of slab. On completion, Zhanjiang Meltshop's targeted annual output is 12.35 million tonnes.

Phase II is being built with blast furnace 3 at its core. All projects are being designed as prime examples of highly efficient, smart manufacturing.

Steel grades produced will include high-strength steel, silicon steel and deep-drawing steel. Slab dimension specifications are 230mm thick, 900mm-1,650mm wide and 8,000-11,000mm long.

To ensure on-schedule, high-quality delivery during the challenges of the pandemic, CISDI conducted Building Information Modelling-based engineering and strict follow-up control of manufacturing processes and onsite control.

CISDI undertook the plant design, package-supplied equipment for the casting platform and the casting finishing equipment, and constructed the meltshop's centralised control centre.

CISDI's expertise and equipment has contributed to the slab caster achieving a number of goals.

- The caster has a 520-tonne ladle turret, the largest capacity of its kind in the world
- Casting and slag manipulator positions are operated by robots
- Intelligent casting and online mechanical scarfing systems are operating smoothly
- Efficient, eco-friendly utilities are assisting safe and stable production
- Intelligent equipment, quality and operation controls are proving effective.

Baowu Zhanjiang Steel's 1,650mm slab caster in operation

Masteel's blast furnace is going green

CISDI is playing a key role in transforming Maanshan Steel's blast furnace 'A' plant to a greener, energy-saving model.

The 4,000-cubic-metre blast furnace was first started up in 2007 and will be shut down in September.

After its revamp, Masteel's advanced, green blast furnace will be more energy-efficient and have an extended service life.

CISDI will be carrying out the re-design and supplying the furnace's non-standard, critical equipment.

Modular fast-revamp technology will be implemented to reduce impact on Masteel's operations.

Orders for CISDI's green, smart mills roll in

CISDI is to supply green and energy-saving rolling mills for Shengquan Co.

Part of China's Sichuan Local Metallurgical Holding Group, Shengquan's plant has a combined line. Its premium steel rolling line is designed to produce wire-rods and bars.

The rolling mills CISDI is scheduled to supply will be manufactured at CISDI Equipment Co. in the Jiangjin District of Chongqing.

Core technologies to be applied in the equipment's manufacture:

- ◆ Hot direct rolling process
- ◆ High-rigidity short-stress path rolling mill
- ◆ Optimised TMCP
- ◆ Ultra-heavy modular rolling mill
- ◆ Reducing and sizing mill with individual drives

Since the start of 2021, CISDI has also received orders for its green, smart steel rolling mills from Luzhou Xinyang Steel and Chengdu Chengshi Metallurgy Co.

Switch-on for Smart Substation

Baowu Shaogang's Yanshan plant now has its first smart substation.

Its Yanjia Line successfully received power, putting the 110kV substation into service.

CISDI was the EPC-based contractor.

Thanks to CISDI's intelligent technologies and smart equipment and measurement techniques, this state-of-the-art substation is leading the field in China.

Safer, more economical and reliable than conventional substations, it features:

◆ Intelligent operational management

◆ Intelligent monitor and surveillance

◆ Cycle inspection

◆ Linkage

◆ Tele-measuring, tele-signalling, tele-controlling, tele-adjusting and tele-viewing.

During construction, one of the major difficulties to overcome was ensuring power supply was not interrupted during switchover.

CISDI's simulation solutions devised an innovative transient, parallel operation method at the 6kV sides of the old and new main transformers.

As an example, the coke dry quenching 1 and 2 shops had an uninterrupted power supply during switchover from old and to new power sources.

Highlighted tech and equipment

Intelligent cabinet

Function: visualised, fully electric control and operation of HV switch cabinets

Features: electric grounding knife, electric bottom car, in-cabinet video surveillance and wireless temperature measurement.

Intelligent cycle inspection robot

Function: improved inspection automation levels and maintenance efficiency

Features: automatic routing inspections on equipment status, meter readings, infrared temperature measurement, automatic data processing and reporting.

Equipment health management

Function: online equipment inspection and repair, which extends service life and reduces equipment-failure blackout loss

Features: an equipment health model for evaluating their real-time status and service life and for risk and trouble analysis, while proposing expert recommendations.

Intelligent supportive control system

Function: automatic controls and linked actions

Features: IoT-based access control, safety protection monitoring, lighting, fan, air conditioning, environment and video systems.

Centralised power dispatching and operational management system

Function: unmanned substation operations

Features: power dispatching, power monitor and control and operational management at Shaogang Intelligent, Centralised Control Centre.

Shaogang Yanshan's 110kV smart substation

CISDI builds Ansteel's latest IT solution

Ansteel has taken a major step forward in its pledge for IT-driven industrial innovation.

The steel giant's information tech system is now online, as part of its full-scale information tech applications.

CISDI built the system to an EPC mode. It takes a project's life-cycle management as a baseline and acts as an integrated information platform, linking its business, finance, design and management.

Oracle EBS constitutes the core of Ansteel IT system and integrates with CISDI's project management platform (CPM).

Multiple application systems have also been registered – CISDI CAD standardised design management, CISDI EKM (enterprise knowledge management), CISDI Nudge+ (mobile office), collaborative office, e-signature and e-mail systems.

CISDI's total solutions will contribute to standardising the enterprise's management, enabling its information to be widely shared and smoothing its procedure flows.

Baowu Zhanjiang's Phase II RHF is home and dry

The CISDI team, pictured in front of the dried Phase II RHF at Baowu Zhanjiang Steel

A new rotary hearth furnace has been dried out at Baowu Zhanjiang Steel.

Package supplied by CISDI, it supports the steel plant's phase II project, which is being constructed with Blast Furnace 3 at its core.

The new RHF will increase the existing Rotary Hearth Furnace Centre's treatment capacity by 200,000 tonnes a year.

It will also help Zhanjiang Steel move towards its zero solid waste discharge target by fully recovering iron, zinc and carbon resources.

Design and construction of the new rotary hearth furnace was carried out in record time.

Work on the engineering design started last May and ended in October. Installation of the proper equipment (bottom machinery) began last July and the furnace was dried at the end of December.

This iron-bearing solid waste treatment centre has created tangible economic and environmental benefits and is boosting Zhanjiang Steel's green development.

Launched in 2016, Baowu Zhanjiang's RHF Centre was the first of its kind in the world's ferrous metallurgy sector.

it achieved an annual treatment capacity of 200,000 tonnes, numerous benchmarks for stability, a dezincification degree over 85 per cent and a metallisation degree of over 75 per cent.

Link

Zhanjiang Steel's Rotary Hearth Furnace Centre is a world-first for ferrous metallurgical plants.

It provides optimal solutions for the treatment and recovery of dusts from blast furnace ironmaking and sludge left from the OG steelmaking process. Its ultimate target is to achieve zero solid waste discharge.

CISDI has developed over 50 patented tech and equipment inventions for rotary hearth furnace-based solid waste treatment.

World-class performance indicators have resulted. They include an 85-90 per cent of dezincification degree and a 70-85 per cent of metallisation degree.

The Phase I rotary hearth furnace at Baowu Zhanjiang Steel

CISDI to build centralised control centre for Zenith

A pan-ironmaking centralised control centre will be built at Zenith Nantong Steel in China's Jiangsu Province.

The control centre is one of CISDI's most sought-after intelligence products.

Its technical features create remote, centralised control, which integrates the stockyard, pelletising, sintering, coking, lime calcination and blast furnace ironmaking plants.

The centre's design and manufacture will follow CISDI's intelligent design philosophy for upsizing while boosting efficiency and eco-friendly credentials.

CISDI's super-fast mill is a success at Ningxia Jianlong

The dual-module reducing mill developed, designed and manufactured by CISDI

CISDI's groundbreaking dual-module reducing mill is now operating successfully at Ningxia Jianlong Longxiang Steel Co.'s high-speed wire-rod rolling line.

The mill is the most precisely-assembled equipment ever to be manufactured by CISDI Equipment Co. and is its fastest-running product, with a designed rolling speed of 120 metres per second.

At Ningxia Jianlong, wire rod produced during hot-testing was eight millimetres in diameter and the rolling speed reached 95 metres per second. The mill has been running stably, to all designed performance targets, since its startup.

The super heavy-duty, 45-degree, top-crossed cantilever mill was developed for special steel wire-rod rolling.

Compared with a conventional wire-rod finishing mill, the dual-module model version has a simpler structure and a higher bearing capacity.

Fast-rolling can be carried out more stably and operation and maintenance is easier.

The mill has strong green credentials thanks to its energy-saving features.

Results achieved:

◆ Increased rolling speed

◆ Improved product quality

◆ More flexible production

◆ Reduced roll and spare parts consumption

◆ Reduced alloy consumption.

Capable of operating at a low rolling temperature of 750 deg. C, the entire mill meets high vibration, temperature and noise control standards.

CISDI's modular rolling tech with individual drives has been widely used for high-speed wire-rod and high-speed bar rolling lines around the world.

CISDI Equipment Co. in Chongqing, a pivotal manufacturing base of CISDI Group, has now delivered over 100 stands of the rolling mill.

CISDI Equipment Manufacturing

We are stepping up more efforts in closer combinations between steel process and the equipment development, design and manufacturing. Our core tech and the intelligent, information and control expertise are applied to transform our equipment and products.

CISDI Equipment Co. at Jiangjin in Chongqing

Short-stress path rolling mill

The NHCD standardised short-stress path rolling mill has been developed to 15 specifications. Around 1,500 sets of NHCD mills for over 70 rolling lines in China and overseas are showing world-class performance indicators.

Mould's electro-hydraulic direct-drive servo oscillator

The CISDI-developed servo oscillator is brand-new and is a first of its kind for the global steel sector. It performs with world-leading indicators.

Universal mill

Our UMCD standardised housing universal mill and NHUM standardised short-stress path universal mill are creating tailored solutions for efficiency and energy-saving in the production of building section steels.