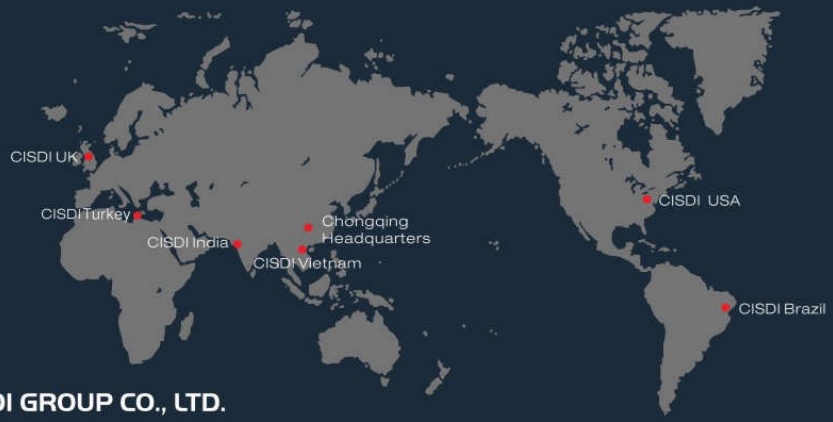

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IN THIS ISSUE

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.

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Rockwell China strengthens relationship with CISDI

Rockwell China's president An Shi paid a visit to CISDI to strengthen a working relationship which spans two decades.

At the meeting CISDI's chairman Xuewen Xiao reflected on the respect the two organisations had developed for each other over the last 20 years.

"We have journeyed a long way together and now have a deep understanding of each other. I hope we can shield ourselves from recent frictions between China and the USA and together work to new horizons in China's New Era," he commented.

"An effective, innovative mode of co-operation should be searched for and a mutual strategic cooperative agreement implemented."

Mr Yu highlighted the importance of Rockwell's role in CISDI's automation, IT and intelligence businesses. "Now we are in good position, building a long-term, effective cooperative and communication mechanism. Team building and division of work are in need of pushing forward so as to implement the agreement objectives."

Mr Shi agreed a solid foundation for mutual trust and working partnerships had been created between the two organisations and said he anticipated bright prospects for joint future projects.

He commented: "Rockwell is transforming developments that bring value-creating solutions to intelligent manufacturing and competitive businesses. Our next work will focus on specific process flows in the implementation of the strategic agreement."

WISCO President visits CISDI

The president of Chinese state-owned enterprise Wuhan Iron and Steel Corporation was a recent visitor to CISDI's headquarters in Chongqing.

WISCO's current upgrading projects being carried out by CISDI, and future plans for working together on intelligent manufacturing projects, were the topics of the day.

An Liu, who is president of WISCO and vice president of Baosteel, met with Xuewen Xiao, CISDI's chairman, and the company's president Zhaohui Yu.

"WISCO is one of CISDI's most important partners," commented Mr Xiao. "We are currently rebuilding WISCO's stockyard and blast furnace and

hope our intelligent and information technological solutions will assist in the development of WISCO's intelligent manufacturing."

Mr Liu commented how much WISCO appreciated CISDI's ability to swiftly carry out the upgrade of its hot strip mill 1.

"CISDI provided satisfactory services for our hot mill restart and I'm confident that both parties will work together for ongoing and future projects."

WISCO and Baosteel both operate under Baowu Group.

New CISDI division will put the focus on green developments

CISDI's Environmental Protection Business Division assemble for the first time

CISDI has launched a new division to focus on protecting the environment.

The Environmental Protection Business Division is CISDI's first administration centre for green developments.

It harnesses the company's corporate thermal engineering teams, utilities and environmental consulting management, business and technology specialists.

The division aims to become one of China's top-tier green providers within three years.

Energy conservation and green business is one of CISDI's four major sectors, as outlined at the company's 2019 annual meeting, and follows the ideology of China's New Era.

CISDI heads back to Baowu Zhanjiang Steel after major contract win

CISDI has won a major contract with Baowu Zhanjiang Steel.

The company is to design the plant's BF3-centred system – incorporating a stockyard, blast furnace, continuous casting and hot strip mill.

In addition, CISDI will design a plant-wide power supply and distribution system, water supply and drainage, a laboratory, the general layout and transport system.

Zhanjiang Steel's Phase I has been running for two years with BF1 and 2-centred plants and the development of Phase II began at the end of 2018.

The new stockyard will be designed for receiving and supply, yard proper, crushing and screening, blending and proportioning. It will have a PCI centralised supply system to downstream blast furnace, plus auxiliary and supportive facilities.

By Phase II, the stockyard's annual receiving capacity will be 43.86 million tonnes (dry basis), of which the BF3-centred plant will require 11.31 million tonnes.

Its annual blending capacity will be 16.32 million tonnes (dry basis), of which the BF3-centred plant requires 5.62 million tonnes.

Its annual supply capacity will be 71 million tonnes, with BF3-centred plants requiring 20 million tonnes.

To build this fully-equipped stockyard to fit the demands of the 10-million-tonne coastal steelworks, which has multiple-users and complicated supply routes, CISDI is applying its highly-advanced intelligent and eco-friendly stockyard expertise.

Green and clean production methods will be encompassed, along with digital management and unmanned autonomous operations.

Blast furnace 3 will be built to a volume of 5,050 cubic metres, matching BF1 and 2. The annual hot metal output will be 4.02 million tonnes.

Phase I's twin blast furnaces are seen as 21st century models of eco-friendlier innovation.

They each have excellent running indicators and are achieving sound environmental results for low energy use and material consumption, recycling and zero waste discharge. They were package-supplied by CISDI and feature a high degree of CISDI's innovative technical features.

The new continuous casting plant will be built as a 2-strand 1,650mm slab caster capable of producing 2.80 million tonnes a year.

Phase I operates with a pair of 2-strand, 2,150mm slab casters and a 2-strand, 2,300mm slab caster 4.

CISDI undertook the design of the caster shop plant and a full package supply for caster 4. It carried out most of the package supply for casters 1 and 2.

Thanks to a number of CISDI's self-developed innovative technologies, Phase I's casters have been running continuously and very efficiently and are able to produce 8.50 million tonnes of stable, high-quality slabs a year. They are used for rolling automobile sheets, high-strength steel coils and other high-end products. Baowu Zhanjiang have found them to be remarkably cost-efficient and making a healthy profit.

The hot mill will feature a new 1,780mm strip production line consisting of a reheating furnace, reversible roughing mill, crop flying shears, finishing mill, downcoilers and a coil dividing and skin pass mill. The new hot strip line will be designed to produce 4.50 million tonnes of coils a year.

Zhanjiang Steel's Phase I stockyard is operating with digital management and unmanned operation and clean production

The mega twin blast furnaces at Zhanjiang Steel Phase I are world leaders for energy efficiency and low consumption

Continuous caster 4 in operation at Zhanjiang Steel's Phase I, producing zero-defect slabs in a highly efficient and low cost way

CISDI's guiding hand at FHS ensured bosses and workers could happily celebrate Tet

CISDI's expert production and operations team are pictured at FHS's BF casthouse platform

Tet, the most popular holiday and festival in Vietnam, marks the country's New Year and the arrival of spring.

It's a time for family reunions, and this year and last, CISDI employees have ensured that workers and bosses at Formosa Ha Tinh Steel have been able to relax and enjoy their celebrations, safe in the knowledge that blast furnace operations were running smoothly in their absence.

"We cannot lead a happy spring festival without your attendance here at site," Zi Lu, the senior vice president of Formosa Ha Tinh Steel, remarked on a visit to the blast furnace earlier this year.

FHS Vietnam is the Formosa Group's first steel venture and needed CISDI's production and operations technical assistance team on-site to monitor and ensure the smoothness of blast furnace operations.

There have been numerous other occasions when this extra support has been given. Back in 2016, to ensure the safe and stable control on startup of blast furnace 1, CISDI organised expert teams to oversee the blow-in, equipment commissioning and construction management and was the chief co-ordinator among the end-user, the builder and the maintenance company.

CISDI teams also prepared the dedicated technical document for the startup of FHS's twin blast furnaces and staged thorough training courses for FHS's technicians and operators.

The success of BF1's blow-in, and its willingness to go above and beyond for FHS, saw CISDI win the contract to supply technical assistance for BF2's blow-in.

"Hard work pays off," said a CISDI spokesperson. "Our experienced production and operations assistance team went on to facilitate BF2's successful blow-in. The furnace is performing with an optimised heat system, hot metal tapping is smooth, as is equipment overall, and the workforce is performing well. PCI started running three days after the blow-in and a fast ramp-up was achieved."

CISDI's dedication and professionalism alleviated concerns FHS had around blow-in and early-stage operations. "CISDI supplied us not only with quality blast furnace equipment, but also excellent operations technical assistance," said an FHS spokesperson.

The twin blast furnaces are now running smoothly, with all main production indicators exceeding the design. There has not been a single hanging, slip or channeling incident, which can occur in large blast furnaces and FHS is seeing significant savings on time costs and malfunction costs.

As a result, FHS invited CISDI to provide production and operations technical assistance at its steelmaking and rolling plants, despite the fact that CISDI is not the designer and EPC contractor of those plants. It took only two months for CISDI to achieve much smoother operations at the steelmaking plant.

Commended FHS's stakeholder, the China Steel Corporation: "We are fully confident in and appreciative of CISDI's technical assistance capabilities, expertise and experience".

A night view of FHS's twin blast furnaces in Vietnam, which represent China's first export of large-sized ironmaking equipment. They each have a volume of 4,350 cubic metres and were built by CISDI to an EPC mode

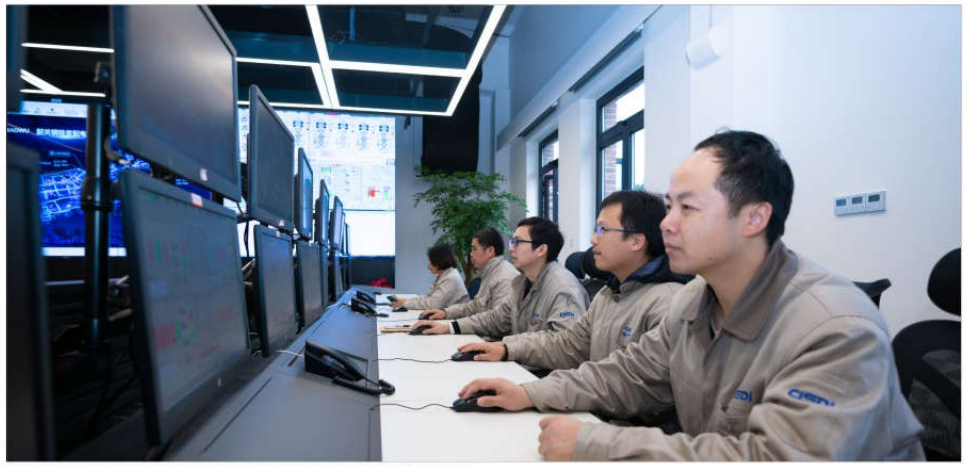
Isdemir places an order to CISDI for gas holder

CISDI is to supply a 50,000-cubic-metre COG holder to Isdemir in Turkey.

CISDI-patented Piston, Oil seal and Cylindrical shell technology will be applied. POC enables large volumes, a high and stable working pressure, and a smaller footprint. The patented design gives excellent sealing properties and an extended service life for the seal structure.

The POC gas holder has seen 53 references both at home and abroad. All companies are reporting their gas holders are running safely, reliably and economically.

CISDI's intelligent power distribution network adds wings to Shaogang Intelligent Centre



CISDI's engineers working at the Shaogang Intelligent Center

CISDI's intelligent distribution network has been helping to run Baowu Group's Shaogang Intelligent Centre since the end of last year, when the upstream-BF and energy centre were started up.

The intelligent distribution network has four general substations which generate plant-wide power. Power plants 2 and 1 are the remote control centre for the system distributing gas-compressed air. This intelligent distribution network provided substantial support and guarantees for the upstream-BF and energy centre's centralised control and efficiency enhancement. In effect, it adds the wings which enable Shaogang Intelligent Centre to maximise its functions, and empower intelligence on electric energy.

The energy centre performs a number of intelligent functions – remote measurement, remote signaling, remote vision, remote control and remote regulating and intelligent patrol checking for five general substations, six power generation stations and 34 regional HV distribution rooms.

CISDI is in charge of electric centralised control for plant-wide power generation and supply, including an electric scheduling system, intelligent aid systems for each of the four substations and related advanced applications.

CISDI has configured a three-loop network – a two-loop main for the electric scheduling system and a one-loop main for the intelligent aid system.

All the general substations and main power generation stations will connect to the three main loops. The sub-level regional HV distribution rooms will join their corresponding general substations or power generation stations via a star or minor-loop network.

The Intelligent Centre will become a greener, more interactive, safe, cost -effective and highly efficient 'brain' for Shaogang steelworks.

On startup and as completion of the intelligent distribution network progresses, main facilities will see greater reliability during operations and improved availability of resources.

The substation and power generation station will have optimised production management. Furthermore, the network will upgrade Shaogang grid's HV equipment status monitor and improve the centre's safety control and emergency responses.

The plant-wide general substations and power generation stations will be operated autonomously, without the need for workers - a stride forward to real-sense intelligent manufacturing.

CISDI's intelligent power distribution network

CISDI is now working on advanced applications of the network, which will make 'the brain' even smarter.

The company's work at Shaogang is a prime example of the intelligent distribution network total solutions it is able to supply to electric consulting, intelligent substations, intelligent micro grids and intelligent distribution upgrades.

CISDI's solutions can be tailored to a client's own distribution network.

CISDI to supply bar and wire-rod mills for HBIS Shijiazhuang Steel

CISDI has won two technology contracts for Shijiazhuang Steel's relocation and upgrade projects.

The company is to be the technological lead for HBIS Shijiazhuang Steel's premium special steel heavy bar mill, plus a quality high-speed wire-rod mill. In addition, CISDI is to package-supply the rolling equipment and hydraulic and lubrication systems.

The heavy bar mill is designed to produce 800,000-tonnes a year, made up of ø80mm-ø260mm alloy round bars, 150mm-300mm square blooms and 75mm-180mm square bars, reserved for producing flat rolled-slabs.

The high-speed wire-rod mill is designed for the annual production of 400,000-tonne coils to a size of ø5.0mm-ø28mm.

Both mills are geared to mechanical and automobile products. Applicable steel grades are quality carbon steel, alloy structural steel, pinion steel, free-cutting steel, cord steel, spring steel, bearing steel and tool steel.

Multiple CISDI-developed core technologies and equipment will be applied – the BDCD breakdown mill, NHCD short-stress path rolling mill and FSCD flying shears.

CISDI tech modernises Baosteel Desheng's BF3

The CISDI-designed blast furnace 3 at Baosteel Desheng has been successfully revamped and blown in for tapping.

The furnace was first built in 2009 for producing low-nickel hot metal.

It was stopped for 84 days from mid October last year for a revamp and CISDI applied a host of innovative technologies to modernise it.

The blast furnace proper's coolers, refractory and water system were rebuilt. The hearth's castables were built as one block to replace ceramic cups, and the pebble stove was altered to a top-combustion checkered stove. This increased the hot blast temperature from 50 to 100 degrees Celsius.

The original sand-brick-filled casthouse was elevated to a flat casthouse, with the installation of an enclosed floor-type dust hood for tapholes and a water-cooled tuyere platform above tapholes.

The revamped casthouse area is now a much cleaner and brighter environment for people to work in.

The vibrating screen under the stockhouse has been transformed into an enclosed complex frequency screen, which minimises flying dusts.

The dedusting system has been thoroughly modernised by re-engineering stockhouse dust collection points and increasing the air volume.

Inside the casthouse and stockhouse, dust collectors now have folded filter drums in place of the original conventional bag-skeleton filters. The filter space remains unchanged, but the filtering areas have more than doubled and meeting emission standards is guaranteed.

BF3's gas dry cleaning, hydraulic, automation, instrument and telecommunications facilities have been also modernised.

Fact file

Baosteel Desheng Stainless Steel, part of the Baowu Group, is one of China's most dominant nickel alloy producers. Its skills are metallurgy, hot rolling, solid solution, cold rolling. It trades in nickel, nickel alloy and other alloys, hot and cold-rolled stainless steel coils and nickel-alloy coils.

Shandong Steel's Rizhao BOF4 is hot-commissioned

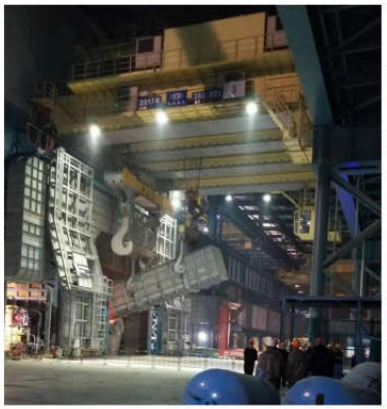
BOF4 for Shandong Steel's Rizhao Meltshop has been hot-commissioned.

Shandong Steel's Rizhao Plant is a key demonstration project for pilot steel restructuring and transformation in Shandong Province, China.

Success at BOF4 concludes the meltshop's full startup of four BOFs and two LFs, all provided under CISDI's turnkey package.

The meltshop will supply high-quality liquid steel for downstream high-added-value thin strip and medium plate-rolling. The target capacity is 8 million tonnes a year.

Construction on the meltshop began in February 2016. CISDI built all four BOFs, each with a 210 tonnage, four KR desulphurisation stations, two LFs, three RH vacuum refinery furnaces and 2-set 2-strand 1,950mm slab casters, a single-strand 3,250mm slab caster, one single-strand 2,500mm slab caster (relocation) and one single-strand 2,600mm slab caster, plus utilities.



The CISDI-built meltshop at Shandong Steel's Rizhao Plant

CISDI tech turns Hanye Special Steel's ultra-thick slab caster into a world leader

CISDI-developed technology has successfully upgraded the ultra-thick slab caster 3 at Hanye Special Steel, making production safer, cheaper and more stable.

Hanye Special Steel operates under the Henan Longcheng Group.

The company's ultra-thick slab caster first went into use in 2011. It produced length specifications ranging from 1,700mm-2,700mm and thicknesses of 250mm, 300mm, 350mm and 400mm. However, the downstream rolling production needed an online width adjustment function adding.

CISDI supplied the new function, an online width adjustment function for the mould, as a package product.

The function is now working successfully and the slab caster's operational safety, stability, flexibility, high velocity and control abilities are now among the best in the world.

The slab produced is particularly thick at 300 millimetres, and wide and narrow adjustments can now be made online.

This technology is based on an envelope-width adjustment model and integrated multi-disciplinary expertise.

Its development heralds a new era for more efficient slab casting.

The same CISDI technology has been performing well for common casters at Baosteel Xinjiang's Bayi Steel, Baosteel Zhanjiang and also at Shagang.

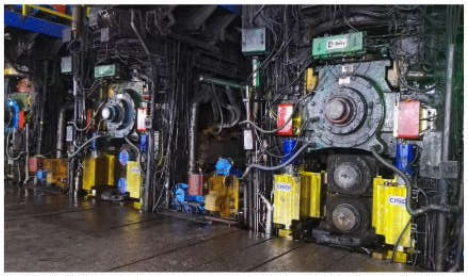
The three plants have reported great improvements in caster availability and yield. Hanye's reference is a first for ultra-thick slab casters.

Hanye Special Steel's ultra-thick slab caster is hot commissioned with CISDI's feature product - mould online width adjustment

CISDI Equipment Manufacturing

> "CISDI's equipment manufacturing bases in Chongqing, Xi'an and Beijing provide intelligent manufacturing total solutions for IT, green, intelligent and flexible manufacture."

CISDI ably provides package equipment for global clients. Keeping environmentally-conscious and intelligent manufacture in mind, CISDI's manufacturing bases innovatively apply the process and automation control, 3D printing, internet plus, flexible manufacturing technology to the equipment manufacture.



Finishing Mill package supply for TATA UK Port Talbot, China's first export of core hot rolling equipment to Europe

Chongqing Base – CISDI Equipment Co.

An aerial view of Chongqing's manufacturing base

This manufacturing base is CISDI's research pilot plant, core equipment maker and non-standard machinery integrator.

Chongqing can deliver over 20,000 tonnes of high-precision critical equipment a year. Its workshops cover over 80,000 square metres and are equipped with over 300 sets of the latest high-precision CNC machine tools and over 100 sets of advanced measuring and metering devices.

This manufacturing base is CISDI's research pilot plant

Inside the Chongqing's manufacturing shop

Xi'an Base – MCC-SFRE Heavy Industry Equipment Co.

SFRE's base in Xi'an

The Xi'an base can deliver 50,000 tonnes a year and has over 2,000 sets of melting, blank forging and casting, riveting welding, component heat treatment and machining facilities. The plant can manufacture all the machineries for steel production lines. Heavy equipment is a specialism.

Beijing Base - CISDI Electric Technology Co., Ltd.

Inside the Beijing electric shop

CISDI's electric equipment manufacturer has over 20,000-square-metres of workshop space.

It produces a wide range of electronic and electric drives - delivering over 10,000 sets of electric drives a year – plus HV and LV and drive packages, automation-integrated products, new energy charging piles, and energy storage products.

The Beijing base is also equipped with an advanced electric drive lab for conducting dynamic and static state full-load tests, environmental tests and electromagnetic compatibility tests.

CISDI equipment

CISDI's mission is to synergise the steel process.

It is achieving that aim via its equipment development expertise, its design and manufacturing skills and its outstanding technological knowledge.

Steel manufacturing across the globe is benefitting from its intelligent, information and control technologies.

CISDI's leading products are pictured below:

A new-style no-bell top for a blast furnace's parallel or serial hoppers

A BOF self-adaptive constraint system, with a 4-point linkage suspension system, including an oxygen lance

NHCD short-stress path rolling mill

3-roll tubular mandrel mill

Mould's hydraulic oscillator

Strip cold tandem mill

CEE 1100-series storage PCS and CEE 2100-series storage system

MVC 1301-series high-performance AC-DC-AC frequency converter

CISDI
Technology and Solutions Partner for the Global Metals Industry

Baowu Shaogang upstream-BF integrated intelligent control platform - CISDI builds it as a benchmark of China's steel intelligence levels.

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