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CISDI boss meets with China's steel giants

Some of the biggest names in Chinese steel were on the agenda when Xuwen Xiao, the chairman of CISDI Group, travelled to a succession of high-level meetings.

First stop was Baowu Zhanjiang, where CISDI is playing a key role as designer and supplier for the construction of the plant's blast furnace 3. Zhanjiang is being transformed into one of the world's most competitive and intelligent steel plants and the current blast furnace project is running to schedule. Both parties have joined forces to push for a smooth start up.

Zhanjiang's chairman Daide Liu spoke of high hopes for further CISDI involvement in the steel plant's transformation. "CISDI has given its full support to Baowu Group and Zhanjiang Steel. We hope more of its new tech and equipment will go into the plant," he commented.

Mr Xiao said: "CISDI and Zhanjiang Steel are strategic partners. I am proud that we have forged a strong relationship which goes beyond that of service provider and customer, and we are keen to support developments at Zhanjiang."

There was a fruitful exchange of ideas for future joint projects at a meeting with Baosteel Shanghai's vice president, Genghong Sheng, and Mr Xiao also paid a visit to Maanshan Steel.

At a meeting with Yi Ding, president of Magang Group, and Qiangming Wang, the president of Masteel, CISDI's masterplan for Masteel that has now been merged into Baowu Group won praise.

Setting out the strategy, orientation and layout of Masteel, the masterplan will assist Baowu to reach a projected annual output of 100 million tonnes.

"Your plan is far-sighted, clearly defined and gives us an insightful route. We will be specifying the steps for its implementation," commented Mr Ding.

Both parties will be working together to build Masteel as a Baowu Group green base.

CISDI and Yongyang join forces for 'golden opportunity'

CISDI and Yongyang Special Steel have signed a strategic co-operation agreement described as 'a golden opportunity'.

Yongyang Special Steel is located in Handan City in China's Hebei Province. With a nearly 30-year history, Yongyang's light rail system is the province's most famous product.

Its annual quality steel production is around 1.20 million tonnes and its annual production of special steel sections is 2.20 million tonnes.

CISDI's first order from Yongyang - a light rail rolling line - was awarded last year. This year, CISDI will supply the mechanical, electric and hydraulic integrated equipment for Yongyang's heavy rail rolling line.
CISDI and Pangang strengthen their bond of steel

Pangang and CISDI are planning to work together on greener, intelligent developments.

Pangang’s chairman Xiangdong Duan was recently welcomed to a discussion on future projects at CISDI’s HQ in Chongqing by chairman Xuewen Xiao.

The two Chinese steel giants have a long and fruitful history together and the relationship will now strengthen further.

Highlighting recent marketing, strategy and core business results, Mr Xiao commented: “CISDI has long been associated with Pangang’s construction and development and will be supporting the building of a future-oriented, greener and intelligent Pangang.

“All businesses within CISDI Group are focussed on steel and creating value for our customers. Our consulting-led, EPC-based services are supported by the latest intelligence and information technology and exciting standards of equipment manufacture.”

“We are spearheading IT-based flows and intelligent manufacturing in the pursuit of ever-higher efficiency and cost performance and stabler production.”

Mr Duan praised CISDI’s remarkable innovations and breakthroughs in steel process, tech and equipment.

“CISDI and Pangang are playing a part in the development of China's steel sector. We should reinforce our wider collaboration in green and intelligent manufacturing. Pangang’s development will involve CISDI’s continual advancements in these sectors,” he said.

During the meeting Mr Bo Yang, executive vice president of CISDI Information Technology Co., reported on CISDI’s intelligent manufacturing demo projects and digital proposals for Pangang and the wider steel sector.

CISDI to carry out China’s first steel digital feasibility study

CISDI’s BIM Centre is to deliver a digital feasibility study for Baowu Yancheng Steel. It will be the first of its kind in China’s steel sector.

The bid and evaluation process took some six months and involved comparison of multiple engineering companies, builders and software suppliers.

CISDI’s full process digital delivery will include design, infrastructure, production and operations.

Yanchang Steel will become China’s first – and one of the world’s first – full-life-cycle digital plants, a Factory of the Future featuring digital design, deliverables, production and operations.

Driven by demand for greater economies, Yanchang Steel’s masterplan will be implemented in phases and has a systematically designed digital infrastructure.

CISDI’s blast furnace tech to boost India’s JSW blast furnace

CISDI has beaten a host of world-leading companies to supply key blast furnace technology for a leading steel plant in India.

The company will supply a process automation system to JSW’s DOLVI plant in India.

The L2 package includes 21 metallurgical calculation and mathematical models and 3 operation guidelines for specific models.

JSW DOLVI Works in Maharashtra is India’s first to adopt a combination of Conarc Technology for both steelmaking and compact strip production, aiding the production of hot rolled coils. It supplies to the consumer durables, automotive and industrial sectors.

DOLVI’s blast furnace 2 has a volume of 5,350 cubic metres and applies a groundbreaking new process. Unusually, the smelting burden consists of 80 per cent pellets.

CISDI’s L2 system is tailored to this new smelting process and application of the CISDI Digital Industrial Internet Platform will enhance the model’s accuracy and reliability.

“The pivotal moment in winning the contract came after we invited JSW to see our blast furnace technology in operation at Formosa Ha Tinh Steel in Vietnam,” said a CISDI spokesperson.

“We have demonstrated our expertise in advanced, reliable, large blast furnace Level 2 technology to the customer on multiple occasions.

“Our technological strength and strong overseas references enabled us to beat many of the world’s most notable candidates to win this new JSW contract.”

The L2 system will be commissioned within six months.

CISDI will co-ordinate with its subsidiary company CISDI India on project management to ensure maximum efficiency.
Du Gang places order for groundbreaking CISDI-AutoARC™

A groundbreaking invention which is steering a greener future for arc furnace steelmaking is winning order after order for the CISDI Electric Furnace Institute.

The latest will see the institute supply its green, intelligent electric arc furnace CISDI-AutoARC™ to Du Gang Steel Co., part of the Sichuan Local Metallurgical Holding Group.

CISDI-AutoARC™ is a world first - it charges scrap cascade-wise, horizontally and continuously, and preheats scrap during the charging process. It features a flat-bath melting and meets China's ultra-low emissions standards.

This energy-efficient, ultra-reliable electric arc furnace is fast-becoming a core product relied on by steel enterprises aiming to boost their competitiveness.

The critical tech behind the invention has been awarded a silver medal in China's scientific and technological advancements awards.

Its multiple breakthroughs in process, equipment, product quality and environmental protection bring significant solutions to the problems experienced with conventional EAFs melting with 100 per cent scraps - namely high energy consumption, unstable quality and dioxin pollution.

CISDI-AutoARC™ is already operating for MCC-SFRE's 70-tonne EAF.

Fact File:
The Sichuan Local Metallurgical Holding Group is a private mini-mill production enterprise comprised of companies in China's Sichuan Province.

Nine plants produce high-strength quake-proof rebar for buildings, plus vanadium-titanium high-strength steel for building construction, alloy steel, industrial steel and other advanced steels.

CISDI takes its innovations into the scrap sector

--- Innovative pilot for safer, stabler and smarter scrap production

CISDI is moving into intelligent solutions for the scrap industry.

Ouyeel Blockchain Finance and Metal Recycling Resources has placed an order for intelligent applications at its smart scrap production and operations base.

The plant aims to reduce the number of workers onsite and some tasks will be carried out by automation. Management will become more transparent and decision-making will be intelligent.

Improvements in scrap production and operations will improve safety, stability and efficiency.

Ouyeel Blockchain is now a core subsidiary of Baowu Group, having previously operated as Maanshan Steel's scrap processing centre.

The Internet of things and artificial intelligence tech will be applied at dozens of its regional scrap bases, including the Chengxing and Zhixian plants.

The applications will transform scrap production, storage, transport, equipment, safety and foreign trade.

Although this is CISDI's pilot project for the scrap industry, its intelligent logistics have been operating successfully at Baowu Bayi Steel's hot-rolled coil warehousing system and Baowu Zhanjiang Steel's reduced-labour wharf.
CISDI to supply blast furnace top equipment to Europe

CISDI is supplying advanced technical equipment for the rebuild of an ageing blast furnace at Ukraine’s largest integrated steel complex. Blast furnace No 9’s top equipment at ArcelorMittal’s Kryvyi Rih Plant will be supplied by CISDI, which has already been contracted as supplier of the blast furnace proper and slag granulation systems for the rebuild.

The top equipment is a patented, no-bell product jointly developed by Baosteel, CISDI and Qihye Heavy Industry.

Blast furnace No 9, built in 1974, has a volume of 5,000 m³ and is one of the world’s earliest large blast furnaces.

The Kryvyi Rih Plant is ArcelorMittal’s most significant steel base in Eastern Europe and the refurbishment will become a benchmark of the company’s technological transformations.

A key part of CISDI’s critical tech for high-efficiency, low-consumption large blast furnaces, the BCQ top system plays a vital role in achieving smoother operation.

CISDI is responsible for engineering the BCQ top system and has innovatively redesigned the distributor’s hydraulic control and the critical parameters. This creates a simpler structure, minimises running problems, makes operation and maintenance easier and enables the top to better withstand the high temperatures and high pressures associated with blast furnace operation.

BCQ top equipment has also been exported to steel plants in South Korea, Brazil, Indonesia, Vietnam and Turkey.

CISDI has made continual advancements to the critical tech of its top, stove, granulation, and other core equipment for large blast furnaces, increasing their efficiency, reducing their energy consumption and increasing their service life. These technologies and equipment are enabling plants across the world to achieve greener and more intelligent manufacturing methods.

They have been successfully applied to 27 large blast furnaces in China and overseas.

Masteel pan-ironmaking centralised control centre is commissioned

Maanshan Steel’s 16 million-tonne steel plant is being transformed to intelligent pan-ironmaking production.

Its six blast furnaces, a stockyard, three coking plants, five sintering machines and their utilities are included in the centralised intelligent revamp, which is being supplied by CISDI.

Software is now being commissioned and the construction design is being developed.

In addition to intelligent, centralised control features for the modernised blast furnaces, the centre will be applying advanced critical point patrol check and management tech to site areas and belt conveyors, and the hot stove’s hot imaging self-diagnosis tech. This will improve patrol check levels and reduce labour.

CISDI’s pan-ironmaking centralised control expertise is already in operation at Baowu Shaogang and WISCO.
Cross-roll straighteners for Chengde pass with flying colours

Three high-precision straighteners have passed delivery inspection at CISDI Equipment Co. in Chongqing.

One Ø140mm and two Ø114mm cross-roll straighteners will be supplied to Chengde Steel’s Ø127mm seamless tube rolling line in China’s Jiangsu Province.

CISDI has previously supplied a piercer mill and mandrel mill for the line.

During three days of tests, all performance parameters met the required standards and the equipment was passed for delivery.

The project team, manufacturer and representatives from Chengde Steel jointly carried out the inspections.

The process included tests on the straightener’s lifting roller seat and travel unit. Multiple working conditions were tested on the angle regulating mechanism, along with inspection of the contact ratio between its roll surface and test sample and the centreline alignment between its stand and the test sample.

A high-precision product, the straightener is designed with a pre-stressed stand and a four-carriage cross-beam structure. It features a separate locking angle, which enables easy alignment of the straightening rolls’ centre.

During development, design and manufacturing, CISDI’s team continually optimised processes, structure, equipment precision and quality.

The straightener is now an impressive new reference for CISDI’s tube rolling line core tech and products.

SPM upgrade achieves strong results at Ansteel

The refurbished SPM is now producing products with a wider specification and greater strength than those produced at similar Ansteel lines.

This is the 25th successful reference for CISDI’s SPM supplies.

The rebuild took around a year, in challenging circumstances. The team were up against constraints posed by the COVID-19 pandemic, plus the need to re-use ageing equipment.

During the process, CISDI provided the design, manufacture and technical assistance for the installation, commissioning and trial production.

Smarter metallurgy is on its way in China

CISDI launches second node of revolutionary industrial internet identifier system

An industrial internet identifier system which will radically accelerate China’s metallurgical industry is being built – with CISDI at the helm.

The system and platform will allow metallurgical enterprises to register ID codes and carry out ID analysis. It will provide a massive amount of accurate IDs and analysis data for industries relying on the industrial internet and big data tech.

CISDI has now launched the implementation of the secondary node platform and standardised system, which will be able to inter-link industrial data chains and standardise information from different sectors and enterprises.

It will achieve a unified industrial data language and trigger innovative data applications, enabling metallurgical production to be swifter, more refined and people-centred.

CISDI Information Technology Co. is leading the ten-member working group for the project, which is made up of the companies who formed a consortium for the bid and includes CISDI Information Tech, CISDI Engineering and China Mminterals.

The secondary node system will support the construction of the physical resources - the steel production line, equipment, materials and products - and also the virtual resources - the system, model and data for ID registry and analysis.
New hi-tech metallurgy lab at Caofeidian has crucial role in ore batching

A state-of-the-art metallurgical lab which will play a crucial role in ore batching has been created at Minmetals Caofeidian in China's Hebei Province.

Based in Tangshan City and built jointly by CISDI and Caofeidian, the raw material and ironmaking metallurgical property lab will act as a research and development centre for ore batching core tech.

New processes and products will be developed for the Caofeidian International Ore Trading Centre.

This lab will also take advantage of China Minmetals' global ferrous metal resource platform. Ore metallurgical property data can be integrated and tested and will support low-carbon smelting process development.

The ore batching recipes this lab verifies will improve Minmetals' status in the sector and increase its trade.

Its state-of-the-art equipment and apparatus simulates the sintering production process. This facilitates testing of the iron ore's physicochemical properties, the grain size, intensity and metallurgical properties of the sintered ore, and the metallurgical coke's properties.

Sinter pot testing has now been successfully implemented at the lab, signalling its operational status.

CISDI was responsible for the lab's building design, the procurement and installation of equipment and the commissioning services.

CISDI and Caofeidian employees worked collaboratively to keep to a tight schedule and difficulties posed by COVID-19 lockdown and high-standard quality checkpoints.

CISDI's determination to maintain quality while keeping pace with tight deadlines ensured a smooth process throughout the lab's construction, installation of equipment and training of staff.

CISDI-AutoARC™ - creating greener and smarter mini-mill melting

CISDI has invented a green, energy-efficient and clean production technology system with the electric arc furnace.

The intelligence in the patented green EAF - CISDI-AutoARC™ boosts energy conservation, consumption reduction, efficient production and facilitates the use of green, intelligent and reliable equipment.

A new-generation melting vessel for the mini-mill process, the green EAF charges scrap creatively in cascades and in a horizontal, continuous process and preheats scrap during the charging process.

It outpaces conventional EAFs, reducing the tap-to-tap cycle time to 35min/heat and power to 330kwh/t and electrode consumption to 1.0kg/t while boosting production efficiency and metal yield.

It is considered a major breakthrough for the sector and has already achieved a number of world-class performance indicators for its ultra-high-power smart power supply, efficient, deep clean melting, eco-friendly transport system and its preheating of the scrap and its integrated controls.

In 2019 a CISDI-led scientific study on The Development and Application of Green Efficient EAF Melting Tech was awarded the silver medal for China's S&T advancements. This expertise has been granted patents in China, the EU and Japan.

Creative, continuous scrap charging with cascade auto batching

Years of research and engineering experience in scrap charging and shaft furnace structure provided the tech roadmap for CISDI's route to the future of green, intelligent electric furnace melting.

The sector needs to prioritise the phasing in of advanced technical indicators, refiguring furnace energy structure and making equipment more reliable. CISDI-AutoARC™ with cascade automatic batching is now providing solutions.

Cascade auto batching during the closed, continuous charging process enables a faster charging speed and better scrap preheating.

Its stepped structure takes up less floor space in the furnace workshop and relieves the original busy batching operations.

A visual identity system is applied to cascade batching, which makes the process stabler and more accurate, and therefore can be performed unmanned.

Remarkable improvements have been seen at MCC-SFRE, where an EAF has been transformed into CISDI's green EAF. It features closed, cascade and continuous charging and flat bath melting.

This cast-steel EAF with a capacity of 70 tonnes is now producing with greater efficiency. Energy consumption and production costs have been slashed and the melting shop is now a clean, safe environment.
**Latest news:**

An association standard – The Electric Arc Furnace with Cascade, Continuous Charging was approved for release in June by the Chinese Society for Metals. CISDI is the chief editor.

China’s top mini-mill melting demo project is to begin. CISDI and Du Gang Steel signed the contract for a CISDI-AutoARC™ in July.

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**Automatic, intelligent melting**

CISDI-AutoARC™ total solutions provide diversified methods of control for enhancing melting automation and intelligence levels.

Multiple sub-system controls for the electric arc furnace are integrated and optimised into the master control system. Field instruments enable interconnection via the gateway controller/protocol. All process information and data is collected, transmitted and controlled.

Mainstream industrial networks are allowed to switch in to the furnace’s master control system. Digital network tech closely co-ordinates all procedures - from furnace melting, scrap preheating and dioxin control to the dust-catching system.

Various status points during melting can be real-time monitored: the judgment of scrap meltdown, foamed slag control, temperature measurement and sampling control, non-contact continuous temperature measurement and fume continuous analysis.

All the information is interconnected and shared in the control system.

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**One-touch operation**

Continual advancements are bringing a one-touch melting operation ever closer.

The upgrading of equipment and online measuring is progressing. Scrap automatic continuous charging equipment has now been developed. The sector now relies on the robot for online temperature measurement and sampling. CISDI innovation has created furnace door automatic cleaning unit and the automatic tapping device.

Multiple intelligent models have been developed for scrap batching, electrode regulation, heating and critical parameters and image feature extractions.

An integrated management system has also been set for controls of the melting data, process quality and cost and peripheral conditions. CISDI-AutoARC™ is now refining mini-mill melting production to meet digital, intelligent, green and lean targets.

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**Recycling excess heat for preheating scrap**

Recycling excess heat from the fume - by as much as 120-140kwh/t - to preheat the scrap is one of the main methods of reducing furnace power consumption.

In addition, CISDI-AutoARC™’s innovative tech saves even more energy by providing a transportation process which is not only more stable than conventional methods, but also ensures thorough and evenly-distributed preheating of scrap occurs.

The cascade steps on the continuous charging channel have a large height difference, which enables the rolling scrap to turn over the steps. This solves the difficult preheating problem which arises in conventional processes where the bottom layer of scrap remains immobile.

CISDI-AutoARC™ can be tailored to suit different requirements.

One option is to intensify the preheating effect by adding external chemical energy at the relatively cold area of the scrap transport belt conveyor. This further reduces melting power consumption and electrode consumption.

This option is designed with two dust-capturing points. The first preheating section ranges from the furnace to the first dust-capturing point. The scrap will mainly be preheated by the fume and the combustion of carbon monoxide in the fume.

The second preheating section resumes between both dust catching points. The height of this sectional stationary channel is reduced and high-velocity burners are installed to burn with natural gas or mixed gas. They can further enhance the fume temperature and flow rate inside the channel, achieving a stronger preheating effect.

The chemical energy can also be fully utilised by a number of control and intelligent means - fume split control, fume measurement and smart control and dynamic sealing at scrap’s inlet.
CISDI's standout reference

- The rebuilt 70-tonne green EAF at MCC-SFRE

  - Vessel capacity: 70 tonnes
  - Output: 400,000 tonnes a year
  - Startup time: 2018
  - Service mode: EPC
  - Transformer capacity: 32MVA
  - Power consumption: 360kWh/t

- Its onsite photographs

CISDI's intelligent, high-strength and optimal SPM

CISDI’s unique, optimised high-strength skin pass mill has been developed through painstaking research and constant innovation.

**Intelligent expertise:**

- Centralised operation controls achieved via innovative, smart equipment and optimised time sequence control
- Integrated operation and maintenance management achieved via fault analysis and push and smart safety control
- Intelligent production management achieved via data collection and fusion analysis
- Innovative deep roll bending (strip's deep drawing) tech plus dedusting function and reversing roller brushing tech plus dedusting function remarkably improve the strip surface quality
- Skin pass roll's online grinding tech ensures strip's surface quality
- Coil tail pre-forming tech ensures coil shape and quality

**Application and patent:**

CISDI has designed and supplied 25 intelligent, high-strength and optimal skin pass mills to clients around the world. Multiple patents have been awarded and there is a strong market demand.

Its many worldwide engineering references are performing with outstanding indicators.