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Visit to Shenyang, China
2017.07.28-30

The CNERC paid an official visit to Shenyang and Anshan, and visited 2 subsidiaries of AnSteel Group. The delegation team consisted of:

- Ir Prof. K.F. Chung Director of CNERC and President of HKCMSA
- Dr. H.C. Ho Deputy Secretary General of CNERC and Executive Manager, Technical Centre of HKCMSA
- Feng Wei, Research Assistant of CNERC

During the two-day visit, the CNERC visited the following delegates:

- Prof. Huaxin Hou, Director of Structural Steel Research Laboratory, AnSteel Group
- Mr. Ming Liu, Senior Engineer, Iron & Steel Products Institute, AnSteel Group
- Mr. WenBin, Engineer, Iron & Steel Products Institute, AnSteel Group
- Mr. Tao Zhang, Senior Engineer, Iron & Steel Products Institute, AnSteel Group
- Prof. Guodong Wang, Academician, The State Key Laboratory of Rolling and Automation, Northeastern University, China
- Prof. Guog Yuan, Professor, The State Key Laboratory of Rolling and Automation, Northeastern University, China
- Prof. Shuai Tang, Associate Professor, The State Key Laboratory of Rolling and Automation, Northeastern University, China

Itinerary of this visit:

1. Visit the Iron and Steel Museum of the AnSteel Group to learn about the development of new China's steel industry;
2. Visit the Iron and Steel plate plant of the AnSteel Gruop, and Anshan Iron and Steel Group's scientific research team for technical exchanges;
3. Visit the State Key Laboratory of Rolling and Automation, Northeastern University, and academic exchange with Academician Prof. G.D. Wang and his research team.

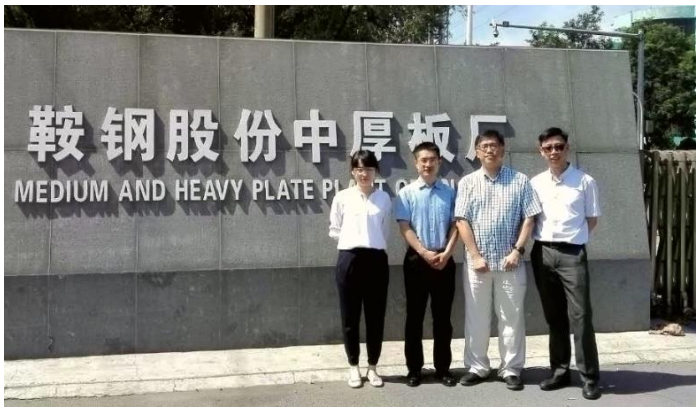
The technical visit to Shenyang was a great success that numerous collaborative plans were reached. During the visit, Prof. Chung briefed the AnSteel Group and the Northastern University the mission and objectives of the CNERC, as well as the Centre’s development progress and its

main research work. In addition, Prof. Chung also highlighted the latest research achievements of the CNERC, and a number of technical manuals. From this trip, the CNERC learned that the AnSteel Group is a leading state-owned enterprise of the Chinese iron and steel industry over the century, and the Northeastern University has dominated the steel fabrication and production process in recent years in conducting research on the technological development and production scale of the Chinese high-strength steel.

The CNERC delegates consulted the steel smelting experts to discuss the progress and application of the new high-strength steel materials; came into contact with various new steel products; and exchanged views and suggestions on the research and application prospect of steel and steel industry, which laid a foundation of the development and execution for the CNERC, as well as to promote communication and collaboration between the CNERC and the mainland steel industry.

CNERC visited AnSteel Group and its Iron & Steel Products Institute

On 29 July 2017, the CNERC delegation team was accompanied by Dr. H.Y. Ban of Tsinghua University and Mr. M. Liu, Senior Engineer, Iron & Steel Products Institute, AnSteel Group to visit the steel plates production line of the AnSteel Group, and learned about the entire production process of the hot rolled steel plate from the ingot to its finishing, and the productivity and the current steel specifications of the AnSteel Group.

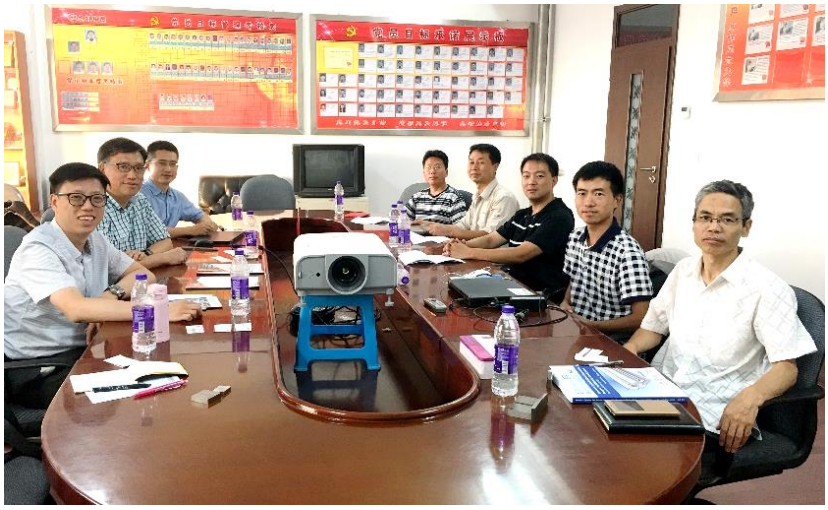


From left: W. Feng, Dr. H.Y. Ban, Prof. K.F. Chung, and Dr. H.C. Ho

From left: Dr. H.Y. Ban, Dr. H.C. Ho, Prof. K.F. Chung, and Mr M. Liu

CNERC visited the AnSteel Plates Factory

In the afternoon, the CNERC delegation team visited the Iron & Steel Products Institute of AnSteel, and was warmly received by Prof. H.X. Hou, Director of Structural Steel Research Laboratory, AnSteel Group, Mr. W.B. Li, Mr. M. Liu and Mr. T. Zhang, Senior Engineers of Iron & Steel Products Institute. The iron and steel experts of AnSteel introduced the latest steel products and technology reports, including the advanced equipment of the AnSteel's plates production line to the CNERC, as well as a variety of steel mechanical properties in steel construction; fabrication of steel composite plates; production process and specifications; development of Longitudinal Profiled Plates (LP) in China and overseas; and research and application of Stainless Steel bimetal Composite Plates.



From left: Dr. H.C. Ho, Prof. K.F. Chung, and Dr. H.Y. Ban
From right: Prof. H.X. Hou, Mr. W.B. Li, Mr. M. Liu, and T. Zhang

Technical exchange at the Iron & Steel Products Institute, AnSteel Group

During the technical meeting, Prof. K.F. Chung introduced the background, objectives and mission of the CNERC to the experts of AnSteel, and presented the second edition of "Selection of Equivalent Steel Materials to European Steel Materials Specifications" to Prof. H.X. Hou, Director of Structural Steel Research Laboratory, AnSteel Group. The AnSteel Group agreed with the mission of the CNERC in promoting the Chinese steel to overseas, recognized its research direction in high-strength steel materials, and being supportive to the CNERC research work. The CNERC delegates were also very interested in the research achievements and new constructional steel products of the AnSteel Group, and a preliminary collaborative plan was reached with details as follows:

- Development of high-end construction steel to promote green construction to cater the broad applications in overseas:

i) Application of Longitudinal Profiled Plate (LP) in high-rise building and large span beam;

ii) Application of composite steel plate in cold formed square tubes, tubes and H-shaped steel structures under high corrosive environment;

iii) Structural application of TMCP and high strength steel plate for large heat input welding.

- Training services

  Train the staff of AnSteel to understand the development and structural construction design standards of high-end construction.

Prof. K.F. Chung presented the “Selection of Equivalent Steel Materials to European Steel Materials Specifications” to Prof. H.X. Hou.

Anshan Iron and Steel Group Corporation

Anshan Iron and Steel Group is the first large scale joint venture in iron and steel and the earliest steel fabricator in China after revolution, and known as "the cradle of China's steel industry". The Anshan Iron and Steel production base is located in Anshan City, Liaoning Province, the main plant area of about 24 square kilometers with 7 large iron ore mines in the Liaoyang Gong Changling area.

Currently, Anshan Iron and Steel has formed a large scale of Iron and Steel Corporation composed of a comprehensive line of steel mining, steel fabricating and steel rolling. Its iron and steel products are diverse including hot-rolled plate, cold-rolled plate, galvanized plate, color coated plate, cold-rolled silicon steel, heavy rail, seamless steel pipe, construction model, building materials and other complete product line. All the products of the AnSteel Group passed the ISO9002 quality assurance; the marine steel passed the certification of 9 countries classification society; the oil pipe passed the API certification; the building materials are certified with the British Lloyd's CE logo; and the main steel products passed the ISO14000 environmental management assurance system and the OSHMS occupational safety and health management certification system. The Corporation has comprehensive competitiveness to enter the international market with international influences significantly increased. Its main production and technical equipment have reached the advanced international level. At present, Anshan Iron and Steel has an annual output of iron, steel and steel materials with a capacity of 25 million tons each. Anshan Iron and Steel has a Headquarter in Anshan, and production bases in Bayuquan New District and Chaoyang. Anshan United (Guangzhou) Stainless Steel Co. Ltd., and Anshan Iron and Steel Han Yang (Guangzhou) Co. Ltd. are located in the east of Guangzhou Economic and Technological Development District, covers an area of 1.2 million square meters, is a professional stainless steel production base of one million tons of steel fabrication, hot-rolled and cold-rolled stainless steel factory in the South China.

CNERC visited China Iron and Steel Museum of AnSteel Group in Anshan, China

On the same day, the CNERC delegation team visited the China Iron and Steel Museum under the arrangement of AnSteel Group. Through the 7 thematic exhibitions of the museum, exhibiting the historical objects, simulated scenes, photos and literature, and multimedia display, the delegation team can fully understand the evolution of AnSteel Group over the hundred years as well as the reform and innovative spirit of the Anshan tradition.

From left: Ms. W. Feng, Dr. H.C. Ho, Prof. K.F. Chung, Dr. H.Y. Ban and Mr. M. Liu.

The CNERC delegation team visited the China Iron and Steel Museum.

CNERC visited State Key Laboratory of Rolling and Automation of Northeastern University, China

On 30 July 2017, the CNERC delegation team visited the State Key Laboratory of Rolling and Automation of Northeastern University, and warmly received by Prof. G.D. Wang, Academician and his research team. Prof. K.F. Chung briefly introduced the mission and research projects of CNERC, and both parties exchanged and discussed on numerous technical issues of high strength steel, including welding performance, structural performance of heat affected zone, QT and TMCP steel fabrication and the comparison on their performances, and refractory steel performance and standard experiments, etc. in construction.

Meeting between delegates of the CNERC and the State Key Laboratory of Rolling and Automation.

Prof. G.D. Wang responded precisely to the queries of the CNERC. Prof. Wang recommended the newly developed "continuous casting and control rolling integrated TMCP steel plate" and "high strength steel plate for large heat input welding", which have already tackled the welding problems in the continuous casting and control rolling of high strength steel. At present, Nanjing Iron & Steel Group Corp., HBIS Group Co. Ltd., and China Steel Corporation (CSC), Taiwan are equipped to produce the abovementioned new steel materials. In addition, the Northeastern University also put forward the experimental requirements and other relevant issues of fire resistance of construction steel. Prof. K.F. Chung introduced the standard fire resistance requirements of construction steel as well as the fire resistance requirements of the European standards on fire resistance building structures, and gave an example on the computational fluid dynamics model of fire in structural analysis. The meeting was fruitful with vigorous discussion,

which benefited both parties a lot, and the following collaboration directions were established:

- Structural design of TMCP steel plate in high rise building construction;
- Construction performance of high strength steel plate for large heat input welding.

Academic exchange on fire resistance construction steel materials.

Prof. K.F. Chung and Prof. G.D. Wang.

The State Key Laboratory of Rolling and Automation

Supported by Northeastern University, the State Key Lab of Rolling and Automation (RAL) is located on the bank of the Hunhe River in Shenyang. It had started its overall construction since 1991, and was accepted by the state in 1995.

Throughout over 20 years, the Lab has been striving to elevate the standard of rolling technology in the country and the quality of its equipment. It contributes to doing fundamental, prospective and strategic basic research for application, the cultivation of high-quality talents and independent innovation, aiming to reach or even lead the world-class rolling technology. The laboratory conducts scientific research and indigenous innovation focusing on major fields of research including the high-quality and cost efficient rolling process of metallic material, optimization of regulation and control over material microstructures through process automation, informatization and intelligentization of the forming process of materials, the advanced preparative technique of material and high-performance material. It has become an internationally influential base for the innovative research and academic exchange of rolling technology.

In October 2014, the lab-based generic technology of steel, along with the green steel technology and equipment platform in the Innovation Center, was designed to achieve the collaborative innovation of the industry-university-research institution interactive mechanism with the work of theoretical studies, technological innovation, development of equipment, evaluation of the product's performance, technical service, etc. The Lab endeavors to push forward breakthroughs in the key generic technology in the country's steel industry and attain transformation development and green manufacturing in the steel industry.