Strengthening Competitiveness of JFE Steel Corporation through Research and Development (R&D)

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Under the corporate philosophy of JFE Steel Corporation, "Contributing to society with the world's most innovative technology", JFE Steel Research Laboratory plots a decisive research and development strategy to enhance the competitiveness of steel industry. By overviewing the numerous technological tasks needing to be solved, the specific action policies are established as follows: 'Innovative processes to improve the quality of products and protect the global environment', 'New products which have the unique and high performances', and 'Basic technologies which support the development of products and processes'. In addition, JFE Research Laboratory takes aim at customers' satisfaction as well as contribution to society.

The representative 'Only one' developments are introduced as follows.

In the field of a sintering process as ion ore pretreatment of iron making, JFE Steel has developed a unique, energy-efficient technology, Super-SINTER® (SINTER: Secondary-fuel Injection Technology for Energy Reduction). The Super-SINTER® is a technology to blow hydrocarbon gases, such as natural gas, into a sinter machine, as a partial alternate for powder coke. The result is greatly enhanced energy efficiency and improved sintered ore quality, which leads to reduce CO_2 emissions in iron making process.

JFE Steel has also developed innovative plate manufacturing technologies incorporated by continuously conducted fundamental research. Among them, Super-OLAC® (OLAC: On-Line Accelerated Cooling) is a revolutionary plate manufacturing technology for high strength, high toughness steel plates with excellent weldability. The Super-OLAC® can realize a high cooling rate substantially equal to the theoretical limit and uniform cooling performance, based on elaborative investigations of heat transfer and boiling phenomena. In addition, JFE has developed the world's first on-line heat treatment process, HOP® (Heat-treatment On-line Process). HOP® is induction heating equipment, installed in plate production line behind the accelerated cooling device, Super-OLAC®. Combination with Super-OLAC® and HOP® has enabled novel metallurgical controlling that cannot be achieved by the conventional TMCP (Thermo Mechanical Control Process). One example of epoch-making products manufactured applying both Super-OLAC® and HOP® is earthquake-resistant linepipe, "JFE-HIPER®". The "JFE-HIPER®" is developed by multi-phase microstructure control with using above mentioned innovative process technology, and won the 2013 R&D 100 Award, presented by the US science and technology publication R&D Magazine. Moreover, JFE steel has some innovative products evolved by R&D activities for automotive use. "JAZ® (JFE Advanced Zinc)" is a steel sheet for automobile bodies with excellent press formability by its extremely low friction coefficient,

applying an original galvannealed steel sheet (GA) and galvanized steel sheet (GI) surface modification technique.

Another indispensable R&D activity is to provide complete solutions in order for customers to utilize our steel products with a safe conscience. For the attainment of the purpose, JFE steel has established special experimental facilities for automotives, ships, civil engineering, building construction and bridges. At these facilities, JFE researchers can make a face-to-face discussion with customers to accelerate new products / new technology for business development and solutions to any technical problems.