FOREWORD

OHDE Naofumi

Senior Vice President,
Director, Plate Business Planning Function,
JFE Steel

Steel plates play a key role as basic materials which support the industrial and social infrastructure, beginning with shipbuilding, building construction, bridges and various types of industrial machinery as well as offshore structures, storage tanks, and materials for UOE linepipe. It is no exaggeration to say that the environment surrounding steel plates has been changing dramatically in recent years, supported by the strong growth of the Asian economies led by China. With the continuing expansion in demand for plates, particularly in the shipbuilding and energy sectors, Japanese mills are increasing their production capacity. In Korea and China, not only increases in production capacity but also constructions of new mills are being planned and some of these plants are beginning to come on stream. At the same time, customers' quality requirements are becoming increasingly sophisticated, stricter, and more diverse. To ensure a stable supply of high performance steel plates, even more advanced plate manufacturing technologies are strongly required. This also includes new product development.

Against this background, JFE Steel is working to enhance its total capabilities by introducing the company's unique steel plate manufacturing equipments and developing new high performance plates utilizing these equipments, while also increasing its production capacity for high performance plates. Specifically in 2003–2004, immediately after the birth of JFE Steel, the company newly installed *Super*-OLAC® (On-Line Accelerated Cooling) equipments in the plate mills at West Japan Works (Kurashiki) and East Japan Works (Keihin) in order to realize more advanced thermo mechanical control process (TMCP) technology, which is the core technology for producing high performance plates. Including the plate mill at West Japan Works (Fukuyama), the company now has three plate mills equipped with the *Super*-OLAC. Another world-leading equipment, Heat treatment On-line Process or "HOP®" has also introduced at the Fukuyama plate mill. JFE Steel is actively developing next-generation plate products utilizing these advanced technologies. In 2005, JFE Steel launched an equipment modernization project aiming at increased its plate production capacity, beginning with system renovation for rolling and shearing at the Keihin

plate mill. As a result, the company's plate production in FY2007 is expected to be 5.6 million tons on a slab base. JFE Steel is also continuing its efforts to increase plate capacity in order to ensure a stable supply, and plans to increase plate production to approximately 6 million tons by the end of fiscal 2008 (the end of March 2009).

In order to respond to higher performance in quality in combination with these capacity increases, how to achieve a higher level of TMCP technology and expand application of TMCP has become an extremely important issue, from the viewpoint that TMCP is an on-line technology for improving the strength, toughness and weldability of steel materials. In particular, the world's first commercial process for accelerated cooling immediately after controlled rolling was realized at Fukuyama District in 1980. In the years that followed, this world-class technology flowered in Japan, and JFE Steel devoted great effort to innovative processes and product developments as the pioneer and the consistent leader in this field.

This special issue features recently developed products and technologies, focusing on high performance steel plates developed with TMCP technology utilizing JFE Steel's flagship equipments, the *Super*-OLAC and HOP.

In recent welded structures, more advanced properties of high strength plates with heavier gauge are required associated with high heat input welding and rationalization of welding work. In addition to refining its TMCP technology, therefore, JFE Steel has also developed new welding technologies such as "JFE EWEL®" and "J-STAR® (JFE Spray Transfer Arc Welding)". JFE EWEL is a microstructure control technology for large heat input welding, in which the toughness of heat affected zone (HAZ) is improved by controlling the grain size. J-STAR Welding enables both ultra-less spatter welding and deep penetration requirements. JFE Steel is developing high performance plates for various fields with TMCP technology and welding technology/HAZ microstructural control as mutually-complementary technologies for advanced steel plates and plate applications. For example, the new products for shipbuilding include the plate with 460 MPa class yield strength for container vessels or the heavy gauge crack resistant plates. For products of building construction or construction/industrial machinery, the Heat treatment On-line Process, HOP is utilized. The low-yield ratio (YR) 780 MPa plate with excellent earthquake resistance or the 960/1 100 MPa class yield strength plates with high hydrogen embrittlement resistance has been developed. For the energy application, JFE Steel has developed and applied high toughness 550/600 MPa class tensile strength plates for storage tanks or penstocks.

In recent years, there have been strong demands for reduction of the life cycle cost of steel structures, and for protection of the global environment, longer life, and greater safety in these structures. This has lent increasing importance to proposals from the viewpoint of

the plate materials that support the industrial and social infrastructure. JFE Steel is also actively grappling with these challenges. The company proposes the plate materials and technologies, such as the corrosion resistant steel plates for cargo oil tanks and the corrosion loss assessment technology for weathering steels. The first would reduce pitting corrosion loss of COT leading lower maintenance cost and enhancement in a vessel's safety. The corrosion loss assessment technology would support customers in selecting the optimum weathering steel suitable for a given environment.

In addition to these noteworthy new products, JFE Steel also provides a full lineup of the world's highest level plate products in all fields. Other products introduced in this special issue include wear resistant steel for construction/industrial machinery, which is showing remarkable growth in demand as a result of worldwide resource development, 9% Ni steel with outstanding brittle crack propagation arrest performance for improvement of the safety of storages tanks for LNG, which has attracted attention as a form of clean energy, high formability Ti alloy "SP700-HM," and waterborne rust-stabilizing surface treatment for weathering steels "Captain Coat Aqua," which is expected to contribute to protect the atmospheric environment by making it possible to minimize the use of organic solvents.

JFE Steel's Corporate Vision is to "contribute to society with the world's most innovative technologies." We are firmly committed to developing new products and new technologies that meet the requirements of our customers, and JFE Steel would appreciate supports from the all concerned customers.