FOREWORD

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Steel pipes and tubular products are used in diverse applications, from familiar city gas and water piping to oil country tubular goods (OCTG) and linepipes used in the production and transportation of petroleum and natural gas, high formability tubes used in automobile parts, and piles and columns for civil works and buildings. All of these are indispensable in modern society. JFE Steel has a production system for all main steel pipe products, including welded pipes such as butt-welded pipes, electric resistance welded (ERW) pipes, UOE pipes, and spiral-welded pipes, as well as seamless pipes and tubes. As a result, the company has an extensive product line and can supply customers with the optimum pipe for the application. In particular, with heightened energy demand in recent years, JFE Steel's high performance, high quality steel pipes such as OCTG, linepipe, and boiler tubes are enjoying strong demand.

In the past 10 years, world crude steel production increased from 700 million tons in 1994 to more than 900 million tons in 2003. In contrast, worldwide production of steel pipes and tubes has not changed greatly, showing a trend between 52 million tons in 1994 and 58 million in 2003, with a peak of 64 million tons in 1997. Japan's pipe production exceeded 10 million tons in 1997, but otherwise decreased from 9 million tons in 1994 to 8 million tons in 2003. On the other hand, both China and Russia posted large gains, with Chinese production rising from 7.4 million tons to 17 million tons and Russian production increasing from 3.6 million tons to 6 million tons between 1994 and 2003.

As shown by these facts, the environment surrounding the steel pipe business has undergone important changes. In responding to these conditions, JFE Steel, as an blast furnace steel maker, manufactures high performance, high quality steel pipes and tubes by applying integrated control to the entire production process from steelmaking through rolling. In technical development as well, the company has systematically developed technologies in all process from the manufacturing process, including material development, rolling technology, pipemaking technology, inspection technology, and material evaluation technology, to quality assurance and evaluation of performance in use.

These efforts have resulted in the establishment of the following distinctive technologies at JFE Steel:

(1) Rolling technology for high Cr steel by the Mannesmann process
(2) 26" ERW mill, which is capable of manufacturing the world's largest outer diameter ERW pipe
(3) *Super*-OLAC/HOP process for plates used as material for linepipe
(4) HISTORY tube manufacturing process for high formability steel tubes

Taking advantage of these process technologies, in the area of seamless pipes, JFE Steel has developed 13% Cr steel pipes which respond to the high level of activity in natural gas development, high corrosion-resistance OCTG (HP13CR, UHP15Cr) with further improvement in corrosion resistance, and 12% Cr steel pipe (MSS12CR) for linepipe. Among UOE products, JFE Steel has developed high strength linepipe X100, high deformability HIPER pipe, and high strength linepipe for sour service, and the company has also developed heavy wall ERW pipe for linepipe by making full use of the capabilities of its 26" ERW mill. JFE Steel has also developed distinctive products in other fields, as seen in the development of materials for automobile parts using high formability ERW and HISTORY tubes, with secondary forming technologies, thereby contributing to weight reduction in automobiles.

At the same time, in order to respond to higher requirements for quality and reliability in steel pipes and tubes, JFE Steel has devoted great effort to the establishment of evaluation technologies such as nondestructive inspection technologies and numerical analysis technologies for prediction of the behavior of products during forming and in use.

This special issue introduces the distinctive features of JFE Steel's pipe manufacturing processes and the products of those processes, and also presents the result of recent technical development related to steel pipes.

JFE Steel's high performance pipes and tubes are contributing to solving global environmental problems through providing a stable supply of natural gas which saves the impact on the environment, reducing life cycle loads, and reduction of CO_2 emissions by reducing automobile weight as a means of improving fuel consumption. As the leading name in steel pipes and tubular products, JFE Steel will continue to contribute to society by supplying high performance, high quality products using advanced manufacturing technologies.