

FOREWORD

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As a long-term trend, demand for energy will continue to grow. Various countries, typified by the United States and BRICs, are engaged in strategic energy development efforts. The diversification of energy is also progressing. Steel products for energy industries are frequently used under severe environments. These steels can be classified as advanced steel materials in terms of performance and quality. For example, high strength and high corrosion resistance tubular products such as tubing, casings, etc. are required in petroleum and natural gas extraction. High strength plates are used in platforms for oil production in offshore oilfields and as structural materials for power generation. Likewise, high toughness steel pipes and plates are used in a wide variety of applications in energy transportation and storage systems, including large long-distance pipelines, oil tankers, liquefied natural gas (LNG) ships, and various types of tanks, etc.

In recent years, development of oil and gas fields has extended into environments with severe use conditions and climates, such as deep water and Arctic seas. At the same time, heavy-thickness products and the ability to withstand severe service conditions have been required in linepipes in order to improve production and transportation efficiency. To meet these needs, improved properties such as high strength, high toughness, high corrosion resistance, etc. are required. Moreover, it is also essential to secure the safety of equipment and facilities, against external factors such as natural disasters.

In response to these trends in requirements, JFE Steel has developed advanced material design technologies and manufacturing technologies. JFE Steel has also put great effort into research and development of application technologies and quality assurance technologies in order to improve reliability under the operation conditions. For example, JFE Steel conducts research on the corrosion behavior of materials in severe corrosion environments in deep oil and gas fields, and the deformation behavior of linepipes in earthquakes. The company not only reflects the results of this research in the properties and quality of its products, but also actively offers solutions of materials selection.

This special issue introduces the results of recent/advanced technological developments

in the fields of steel sheets, plates, and pipes at JFE Steel.