

FOREWORD

Fumiya Yanagishima
Managing Director
General Superintendent, Chiba Works



Kawasaki Steel recently completed the construction of a new hot strip mill and new stainless steelmaking shop at Chiba Works aimed at strengthening the base of its steel business in the Tokyo area and ensuring upward flexibility in production capacity, including stainless steel. These projects, which were carried out simultaneously, were part of a major modernization at Chiba Works that the company undertook, as it looked ahead to the 21st century, in order to secure an overwhelming competitive advantage in product quality and delivery and achieve the “rebirth” of Chiba Works as an attractive steel works coexisting with its urban environment.

Chiba Works was opened in 1951 with the aim of becoming Japan’s first large-scale integrated coastal steel works of the post-war period. After No. 1 blast furnace was blown-in in 1953, construction progressed under the concepts of larger scale, higher speed, and automation. In 1958, Chiba Works completed its first hot strip mill and cold tandem mill, which were the world’s most advanced at the time. From then until the present day, Chiba Works has played a guiding role, as a pioneer in steel, in the astonishing growth of the Japanese steel industry. Moreover, Chiba Works not only specializes in the production of flat-rolled products, but has also actively pursued process and product development, and thus laid the foundation for Kawasaki Steel’s outstanding reputation as a manufacturer of steel sheet.

The former hot strip mill and stainless steelmaking shop, which were main plants at Chiba Works, were repeatedly revamped and upgraded. However, these facilities were becoming superannuated, and were in danger of losing their competitiveness. To meet the need for modernization of these plants, at the end of 1987 the company began a comprehensive study of its production capacity and ideal production system, based on a long-term forecast of steel demand. In particular, the study focused on achieving flexibility in production capacity, in order to respond to fluctuations in steel supply and demand, and on the division of functions between Mizushima Works and Chiba Works. A clear image of the Chiba Works in the future emerged from this process.

Based on this, concrete planning began in July 1988, aimed at full-scale construction for the modernization of Chiba Works. In 1991, a decision was made to construct a new steelmaking shop exclusively for stainless steel and a new hot strip mill at West Plant of Chiba Works, at a total cost of ¥260 billion (roughly \$2 billion at then-current exchange rates). Construction advanced at a rapid pace, and the new steelmaking shop was completed in July 1994, followed less than a year later by the new hot strip mill in May 1995.

At the new stainless steelmaking shop, a revolutionary smelting reduction process which uses raw Cr ore as raw material was realized in a practical operation for the first time in the world, advancing beyond the processes of scrap melting and smelting reduction of semi-reduced pellets which had been the prevailing common sense for many years. The result was a mass-production process for stainless steel with a high degree of freedom in the selection of raw materials. In another world’s first, a coke-packed shaft-type furnace (STAR process), which uses the stainless dust

generated during smelting, was developed and put into practical use, solving an environmental problem by achieving resource recycling.

Until the present day, the arrangement of hot strip mill equipment has paralleled the development of the automobile industry. The period of approximately 70 years after the first hot mill appeared in the United States saw no change in the basic process of rolling one slab at a time. However, the new hot strip mill at Chiba Works frees the steel maker from the constraints of rolling in one-slab units by realizing an "endless hot rolling" process in which sheet bars are joined on line. As a result, the size limits in hot rolling are greatly expanded, making it possible to cultivate new fields in the market for thin hot-rolled products. In addition, Kawasaki Steel is also vigorously pursuing the development of new products such as ultra-deep drawing steel sheet and excellently formable, high strength steel sheet which are based on the endless hot rolling technology. Thus, it can truly be said that the endless hot rolling process is an innovative technology which has changed the history of the hot strip mill.

Although Chiba Works is a medium-scale steel works, the recent modernization has given it exceptional competitiveness in quality, cost, and production stability, and it now possesses the technology and equipment to compete on equal terms with large works, even in the increasingly difficult economic environment expected in the future.

This special issue presents an overview of the Chiba Works modernization project, centering on the basic concepts of the new stainless steelmaking shop and new hot strip mill which were constructed at West Plant of Chiba Works.

Finally, in publishing this special issue, I would like to express my deep appreciation for the cooperation and guidance of all those concerned and ask for your further encouragement in the future.