

# NUCOR STEEL INDIANA

## Construction & Commissioning

Nucor, the company world-renowned for their pioneering development of the thin-slab casting process in the early 1980's, now has the distinction of being the first licensee of the revolutionary Castrip® technology.



*Groundbreaking for Nucor's Castrip plant in Crawfordsville, Indiana*

Construction began on the world's first commercial strip caster in February 2001, and since the groundbreaking, excitement and anticipation have been building at an exponential pace among stakeholders and the steel industry as a whole. The Crawfordsville Castrip facility re-used many of the key mechanical components developed at the Project M plant, which were updated using state-of-the-art technology. Molten steel is provided from Crawfordsville's existing electric arc furnace using a 110-ton ladle, and a new Ladle Metallurgy Furnace has been installed. (See Figure 1 for detailed specifications of a typical Castrip plant. A diagram of the typical plant layout is included in the discussion of process fundamentals.) Nucor's first plant is capable of producing 500,000 tons per year and will employ 55 people when it is fully staffed.

Teams from Nucor and BHP were assembled to complete the daunting task of construction and to ensure the success of the world's first commercially viable Castrip mill. The BHP Australian team members are veterans from Project M. The group is comprised of mechanical, electrical, metallurgical and chemical engineering specialists who bring with them nearly 100 years of cumulative experience in strip casting.

Construction of the Crawfordsville Castrip plant provided many challenges. The small physical size of the Castrip plant, at just one-tenth the size of a typical mini-mill, offered cramped quarters for crews working simultaneously to complete construction and install equipment. Nevertheless, following some minor delays, the world's first Castrip facility was completed in March 2002.



*The completed Nucor Castrip plant*

Cold commissioning of many of the main components was initiated early on, along with hot commissioning of the ladle metallurgy furnace (LMF), and the entire plant moved into hot commissioning mode on May 2, 2002 with the first steel heat delivered to the caster. The Castrip project team and the Nucor operations team have done an extraordinary job of moving the commissioning process forward, and the early results have proven very encouraging. Full size (20 mt) coils have been produced, ladles regularly drained and sequence casting demonstrated. The Nucor Castrip facility is expected to be fully operational by late 2002.

## **The Sales Plan**

While construction of the Crawfordsville plant was being completed, the Nucor sales team was already busy formulating a plan for communicating the benefits of Castrip UCS (Ultra-thin Cast Strip) products to the sheet steel market. (The UCS acronym is used to distinguish the material from hot rolled and cold rolled sheet.) They began speaking to customers in June 2001, and early response from the market was positive, showing that many are eager and excited to begin exploring the opportunities offered by the Castrip product.

When commissioning is complete, the sale team plans to bring the Castrip product to market in a controlled fashion, keeping a close eye on product performance. Initially, the plant will cast at 1.6 mm (0.063") thickness and the product will be utilized as feedstock for further cold rolling at Crawfordsville. Initially, all of the production will be consumed by Nucor divisions and will be used primarily in construction applications. Within a few months, Castrip UCS sheet will be offered to the general market. The product range will be extended to coated products and replacement of hot rolled material for light-gauge tubing, as well as cold rolled material targeted to the motor lamination market.

As development progresses, Nucor plans to bring a high-strength UCS product to the market, which should be particularly appropriate for end uses such as racking systems. And toward the end of 2002, the company hopes to be in a position to produce medium- and high-carbon grades, as well as 409 stainless for automotive applications. The end-point of the first 12 months in the market with UCS products will be the very light gauges of ~1 mm (0.04"), which has tremendous advantages for customers. Medium term, the goal is to produce steel sheet directly from the Castrip process as thin as 0.7 mm (0.028").