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Advanced Level 2 Software Integration for Enhanced Temperature Control from Meltshop to Casting

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As part of its commitment to environmental sustainability, the steel industry constantly seeks to enhance operational efficiency. A significant area of focus is the optimization of temperature control in meltshops, a process traditionally constrained by the limitations inherent in Level 2 systems. These systems, characterized by static optimization and compartmentalized operations, lack a comprehensive integration of production planning and process control.

To address these challenges, we present a modular software system tailored for meltshops and casters. This system innovatively merges the functionalities of traditional process control with advanced production planning techniques, thereby facilitating a seamless transition between Level 2 and Level 3 systems. Central to this approach is a real-time data platform that underpins both metallurgical models and sophisticated data-driven models.

The efficacy of our system is illustrated by demonstrating the implementation in the meltshop at Cleveland Cliffs Burns Harbor, which highlights significant improvements in temperature guidance across various stages of steel production, including BOF, SLD, LTS, and VD. The system utilizes a combination of global recommendation models and local prediction models, all functioning effectively in real-time. These models are designed to consider a comprehensive range of parameters, from energy inputs and chemical additives to treatment processes, transport durations, and the thermal states of ladles and tundishes.

This case study proves that our system not only enhances the efficiency and precision of temperature control in steel production but also aligns with the industry's environmental sustainability goals. By integrating advanced data management and process modeling techniques, the system marks a significant step forward in the technological advancement of meltshop operations.

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