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# Energy-efficient production based on a comprehensive scheduling including an optimized temperature guidance and heat pacing

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ArcelorMittal Eisenhüttenstadt und Smart Steel Technologies bundled forces to establish an optimized temperature guidance in the ArcelorMittal Eisenhüttenstadt meltshop. The underlying core of the supporting models, namely the Ladle Furnace, LF Temperature or Secondary Metallurgy Exit Temperature Model is a digital twin of the whole meltshop. It incorporates all heats and different steel grades, the different ladles in circulation and all aggregates in the meltshop from Basic Oxygen Furnace, BOF, via Argon Stand and Degassing Statio, RH to the caster. All relevant planned and actual timestamps of all heats on their way through the meltshop as well as important process parameters are transferred via Message Queues from the L2 to the model databases. All heats including their temperatures are exactly tracked. Understanding and implementing the material flow in the meltshop including eventual disturbances and delays is crucial to build a digital twin. It is used to exactly model and recommend the hand-over temperature from secondary metallurgy to the continuous caster. The result is a precise temperature and thus, time structure for a smooth high quality production. Further, this optimization is an integral part of the newly to be installed scheduling system, the SST Scheduler. It dynamically ingests the current situation in the meltshop and recalculates the production schedule. Only this comprehensive approach enables a steel plant to exactly plan all start and ends for the individual production steps. A modern dynamic scheduling system considers both a precise timing for an energy efficient production and smooth process flow to fulfill all quality demands and delivery dates.

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