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Danieli Corus and Systems Navigator have developed a Steel Plant Model (SPM) to solve logistical problems and optimize logistics in both existing and new steel plants. The SPM is based on a three dimensional layout, where all movements, actions and interactions of all units, including cranes and ladles, are simulated.
The SPM consists of a model and a human machine interface. The SPM is object oriented and based on actual distances, speeds and processing times. The model includes deviations (e.g. standard or exponential deviations) of processing times as well as downtimes for maintenance and unexpected breakdowns into the simulations, making the results very realistic and accurate. When running the different scenarios that are available, several units, ladles and cranes can be added, modified or removed. This makes it very easy to determine e.g. where bottlenecks are, what the optimum amount of ladles is or what the return on investments such as the addition of another converter or continuous caster will be.

The SPM has been validated for several steel plants with widely ranging characteristics and layouts. It proves not only to be very accurate in predicting production figures like unit utilizations, intermediate waiting times and crane movements, but also to be able to visualize every movement inside the plant at any time. This makes the SPM a very powerful tool to find the weak spots in Greenfield designs, when revamping plants and for plants that are in full operation. Given the flexibility of the SPM, any (new) steel plant can be simulated in quick order when a layout and the requested data are provided.

This article discusses the basis of the model and presents its benefits. In addition, a fictive case that shows the capabilities of the SPM is highlighted.

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