TITLE: LOGISTIC PROCESS SIMULATION OF THE EXIT ZONE OF A CONTINUOUS CASTER

KEY WORDS OF ASSIGNMENT:

➢ Modeling of logistics processes
➢ Maximum flow problems
➢ Simulation using FlexSim
➢ Continuous caster

SUMMER APPRENTICESHIP ☐   MASTER THESIS ☒

WORK/SCHOOL APPRENTICESHIP ☐   PROJECT ☐

CONTENT OF ASSIGNMENT (POSSIBLY ILLUSTRATED WITH PICTURES/DRAWINGS):

ArcelorMittal Gent is a steel production company which is situated in the port of Gent. It produces flat steel products, used amongst others in the automotive industry.
Continuous casting is the part of the production process where liquid steel is cast into a continuous strand, which is cut into separate slabs. In other parts of the factory, these slabs are further processed to coils.

In the exit zone of a continuous caster, the continuous strand is cut in slabs. Each slab is then optionally divided in two along its length, deburred, marked with a number (for future identification) and finally stacked. In exceptional cases, the exit zone cannot follow the pace of the continuous caster. Leading to an unwanted speed reduction of the casting process. Besides the production loss, more importantly, this leads to quality issues of the steel.
With the increasing production rate, this bottleneck at the exit zone will occur more often in the future.

In this master thesis, you will develop a model using FlexSim to simulate the logistics process at the exit zone.
In a first step, this model will be used to evaluate the current production planning (a sequence of slabs with different dimensions and grades). Based on these results, you can determine which part of the exit zone is most limiting and which planning sequences lead to problems.
In a final step, you propose and validate a change in production planning methodology or a physical change of the exit zone (e.g.: extra cutting machine, extra transfer car, …).
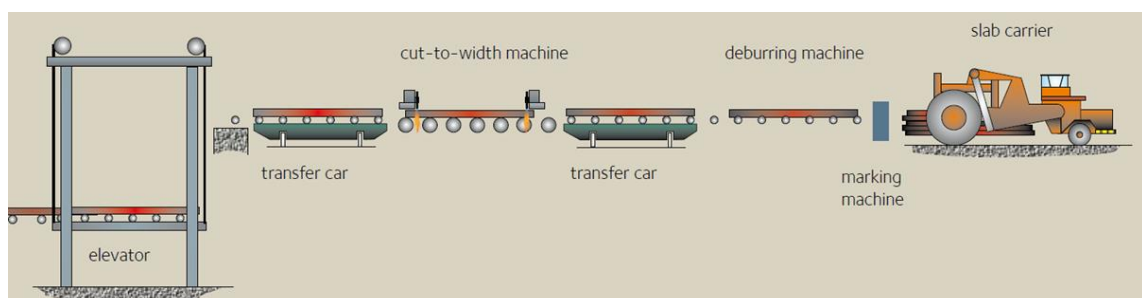
OBJECTIVES:

➢ Create a model of the logistics process of the continuous caster's exit zone
➢ Evaluate current production planning methodology and identify the bottleneck in the exit zone
➢ Propose and validate an upgrade of the exit zone or production planning methodology

EXPECTED COMPETENCES (KEY WORDS):

✓ Able to study algorithms/heuristics for scheduling problems
✓ Data analysis and statistics

NUMBER OF STUDENTS:

➢ 1

TARGET GROUP : BACHELOR/MASTER/ … & SPECIALIZATION(S):

➢ Master of science in engineering (operations research, computer science, …)

LOCATION:

➢ Systems and Models, ArcelorMittal Gent, John Kennedylaan 51, 9042 Gent + at home

PROMOTORS:

➢ Industrial   : Marijn Billiet, Laurenz Peleman
➢ Academic   : ……………………………………………………………………………………..

FIRST CONTACT:

➢ Sofie De Croock: stages@arcerlormittal.com or 09/347.42.16
➢ To check the availability of this master thesis, please mail to stages@arcelormittal.com