

## Case Study Fact Sheet: ArcelorMittal, Gijon/Spain

ArcelorMittal operates a Rail Mill and Heavy Plate Mill in Gijon, Spain with a cooling water circuit of 7000 m<sup>3</sup>. The cooling water is treated in a central Water Treatment Plant (WTP). A pattern of the cooling water circuit and the waste water treatment plant is shown in the figure below. In the Rail Mill cooling water circuit occurs corrosion, scaling and biological activity caused by unavoidable production-related intake of oil, temperature, particle (scale) or the salting (e.g. accumulation of anions) of the water because of evaporation.

The aim of the work is the removal of dissolved salts after solid separation to reuse the water in order to decrease the corrosion (induced by salts) and the freshwater demand/wastewater fraction about 40%. Further aspects are the decrease of sludge treatment effort (dewatering) by high concentrated sludge from magnetic separation and enhanced sludge dewatering as a decrease maintenance saving.

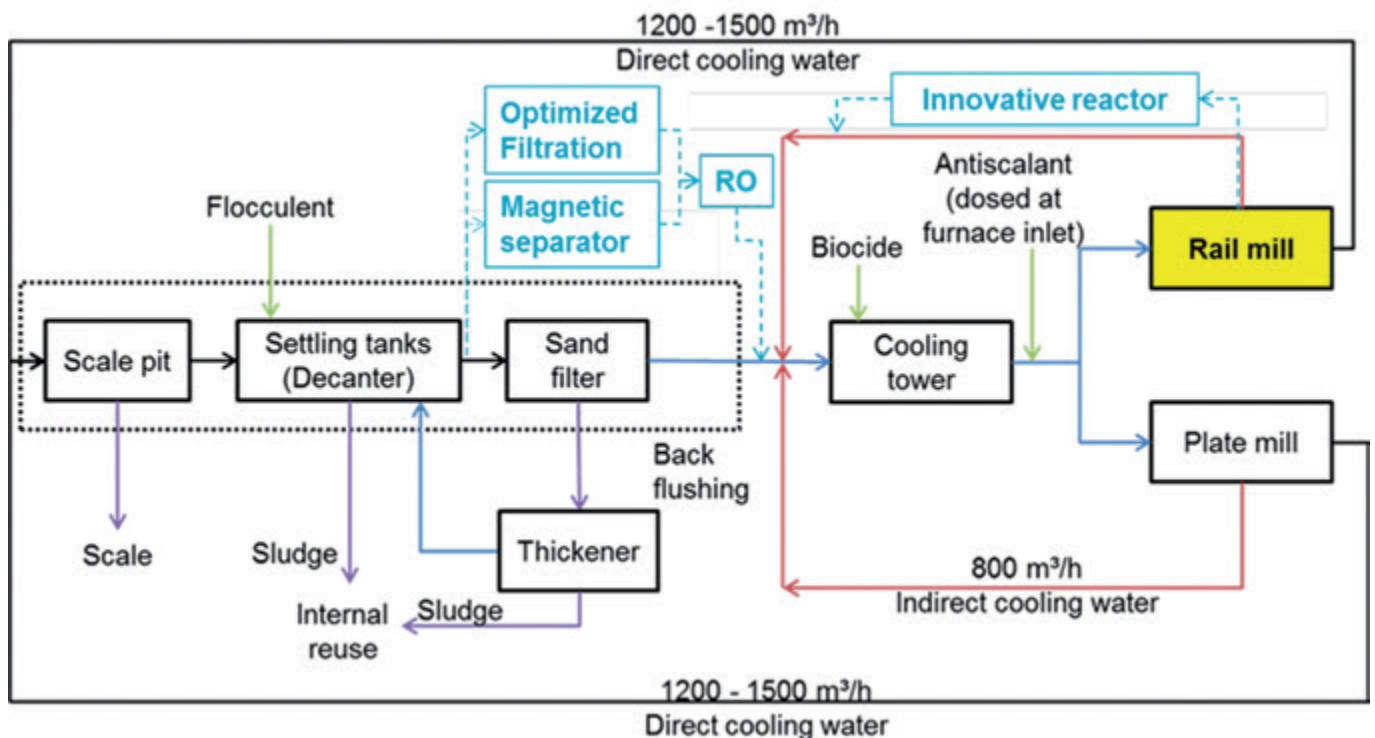
### Objective in INSPIREWATER

The demonstration activities at ArcelorMittal in Gijon include the following specific objectives:

- Investigation of the long term behavior of the relevant technologies in treating abrasive solids, organics (oil/fat) and dissolved salt present in the cooling water regarding e.g. interactions of cooling water treatment chemicals with filter media/RO membrane and scaling
- Demonstration of different combinations of solid removal technologies (magnetic separator, 3layer filtration) followed by desalting/softening (reverse osmosis/innovative electro-precipitator)
- Optimization of operational parameters of the technologies

Technologies used for the treatment in the INSPIREWATER case study:

- Solid removal: Magnetic separator, 3layer filtration
- Softening/Desalting: Innovative Reactor, Reverse Osmosis



Pattern of the cooling water circuit and the waste water treatment plant

### INSPIREWATER activities and first results

- ▶ Installation, commissioning and start of the demonstration
- ▶ Magnetic separator: treatment of approx. 23,000 m<sup>3</sup> with achievement of outlet solid contents down to 10 – 15 mg/L (detection limit for solids: 10 mg/L)
- ▶ 3layer filtration: confirmation of lab results achieving outlet solid contents below 10 mg/L. Determination of best operational conditions.
- ▶ Reverse osmosis: investigation of different concentration factors up to 10 and influence of antiscalant
- ▶ Innovative reactor: not yet started.

### Outlook

- ▶ Continuing of long term demonstration of the different technologies
- ▶ Testing of online solid measurement for tailored magnet cleaning saving water
- ▶ Trials with focus of sludge dewatering



Magnetic separator



3layer filtration



Reverse Osmosis



Innovative reactor

### Technologies in operation during the demonstration

### Contact

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