



DEMONSTRATION – CASE STUDY STEEL

Energy and water saving in a cooling water circuit by usage of innovative technologies leading to reduced corrosion

Situation

- Corrosion, scaling and biological activity caused by unavoidable production-related intake of oil, temperature, scale and salting due to evaporation at a Rail Mill cooling water circuit of ArcelorMittal Gijón, Spain

Aim / Objectives

- Investigation of the long term behavior of the selected technologies regarding interactions of cooling water components with filter media/RO membrane or scaling
- Demonstration of different combinations of solid removal technologies: magnetic separator and 3-layer filtration as pretreatment for protecting the following desalting/softening technologies: reverse osmosis and innovative reactor
- Optimization of operational parameters of the technologies

Demonstration technologies

- Magnetic separation (50 m³/h) with permanent magnets for chemical free and energy saving solid removal in combination with high sludge solid contents
- Filtration with a combination of 3-layer filter unifying an increased solid removal efficiency at optimal flow velocities and a chemical free operation



Magnetic separator



Filtration unit with 3-layer filter

- Reverse osmosis for removal of salts and hardness components by pressure filtration
- Innovative reactor based on electro-precipitation combining chemical free desalting and disinfection



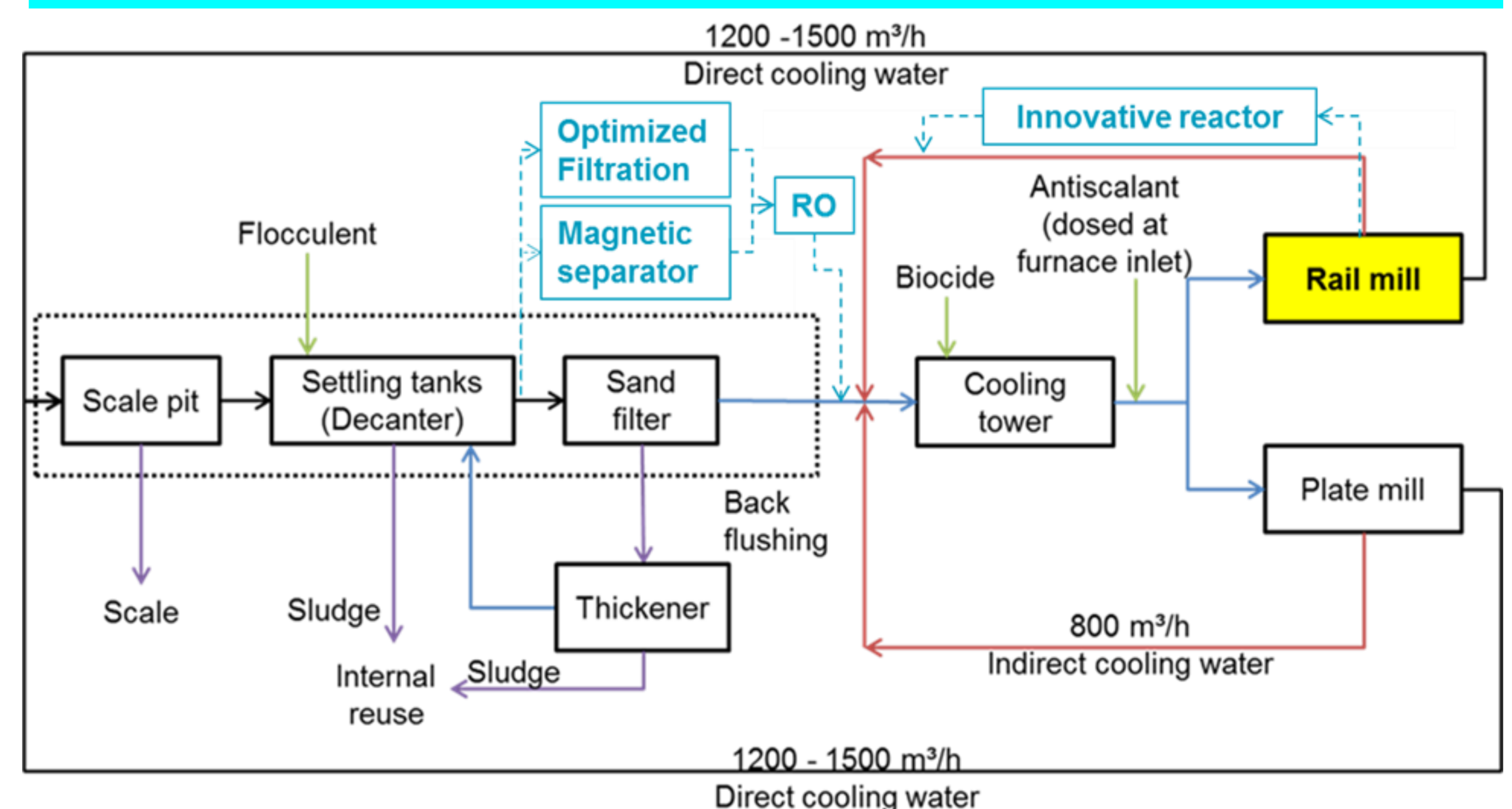
Reverse osmosis



Innovative reactor

Current results

- Installation, commissioning and start of the demonstration three month before schedule



- Magnetic separator: treatment of approx. 23,000 m³ with achievement of outlet solid contents down to 10 – 15 mg/L near the detection limit for solids of 10 mg/L
- 3-layer filtration: confirmation of lab results with achievement of outlet solid contents below 10 mg/L. Determination of the best operational conditions
- Reverse osmosis: concentration factor up to 10 is possible with a flux of finally 12 L/m²h

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