Metso

Flotation optimizer

The Flotation optimizer improves flotation performance by controlling the key variables of a process. The application strives to achieve the given performance goals for grade and recovery, while utilizing other measurements and information from process control system to prevent instabilities.

Improving process stability is the key to successful and effective flotation process control. For example, when the feed grade and ore properties change, timely adjustments are needed to maintain a stable process. When the process is stable, tighter margins can be maintained and run the process closer to target. The result is higher recovery with same grade because of operating more at optimal process area (less turbulence, more constant mass pull, optimal use of reagents, faster reaction to head grade changes, etc.)

The Flotation optimizer utilizes on-line elemental measurements (Metso Courier) available from the process and manipulates the mass pull and reagents.

Controlled variables typically are:

• Tail grade % (minimized)
• Concentrate grade % (a target value, kept within limits)
• Circulation load

Traditionally mass pull has been adjusted by changing aeration rate and/or slurry level. Because the froth velocity (Metso FrothSense) has been proven to be a good indicator for the mass pull of a flotation cell, the Flotation optimizer will manipulate the setpoints of froth speeds instead of air and level control loops.

Depending on the level of optimization, Flotation optimizer can be implemented either for a single part of the process (rougher/scavenger, cleaner circuit) or for the whole flotation process. If the process is large and involves a lot of feedback loops, the best benefit is achieved by splitting and building a dedicated Flotation optimizer for each.

The control strategy is always customized for the customer's specific flotation process. It combines customer experience with Metso know-how of multiple flotation processes.
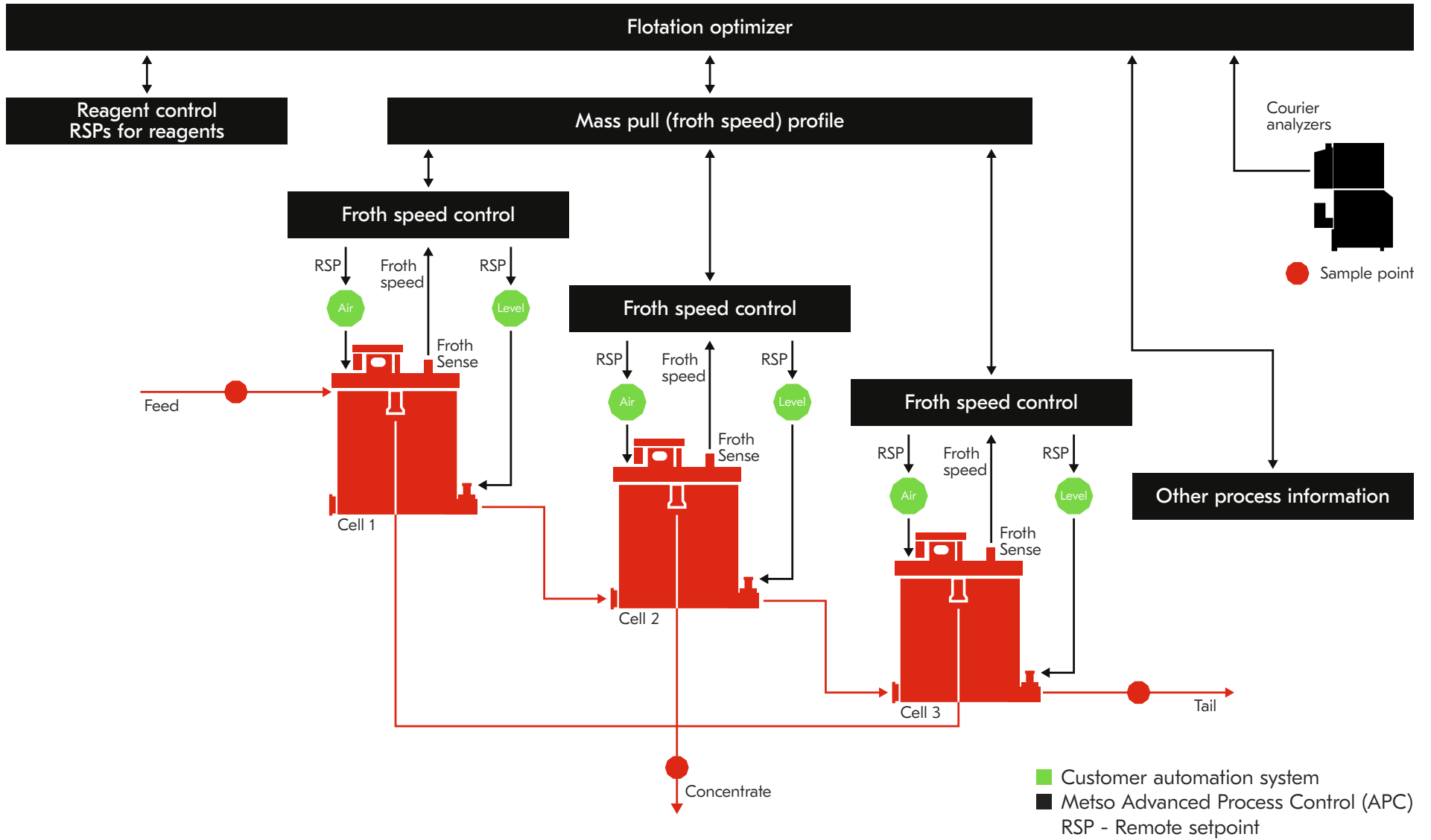
The Flotation optimizer is based on proven proprietary APC platforms and is built by using Model predictive control (MPC) algorithm.

Typical recovery increase 1-3% units
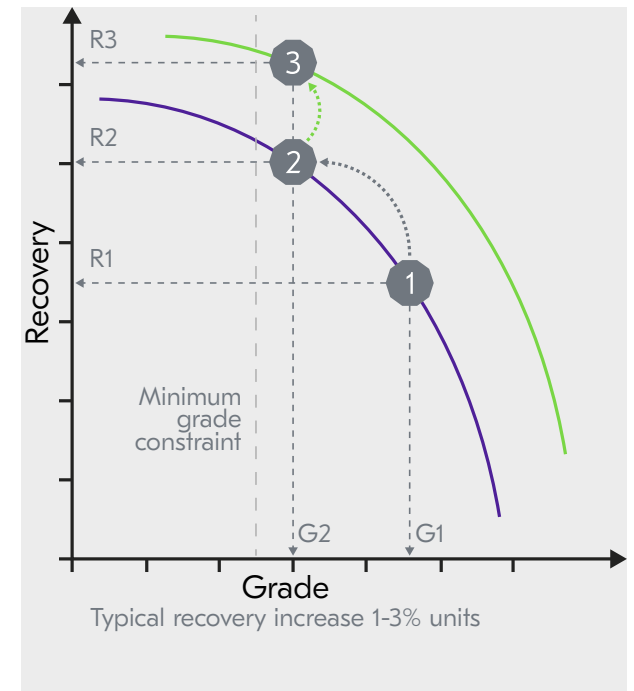
Benefits
• Stabilized flotation process with variable feed grade
• Increased recovery with optimal grade
• Reduced reagents consumption and costs
• Free up operator time for fine-tuning of the process
• Improved function of downstream

Example of system architecture

Flotation optimizer

Reagent control RSPs for reagents

Mass pull (froth speed) profile

Courier analyzers

Froth speed control

RSP | Froth speed | RSP

Air | Froth Sense | Level

Feed

Cell 1

Froth speed control

RSP | Froth speed | RSP

Air | Froth Sense | Level

Cell 2

Froth speed control

RSP | Froth speed | RSP

Air | Froth Sense | Level

● Sample point

Other process information

Cell 3

Tail

Concentrate

■ Customer automation system
■ Metso Advanced Process Control (APC)
RSP - Remote setpoint

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Metso is a frontrunner in providing sustainable technologies, end-to-end solutions and services for the aggregates, minerals processing and metals refining industries globally. By helping our customers increase their productivity, improve their energy and water efficiency and environmental performance with our process and product expertise, we are the **partner for positive change.**

Metso

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