Metso:Outotec

VTM PSI®300 Particle Size Analyzer and Drive Upgrade



The better control you have over your grinding particle size, the better control you have over your mineral recovery. This requires accurate monitoring and control. PSI inline with VFD can help with that.

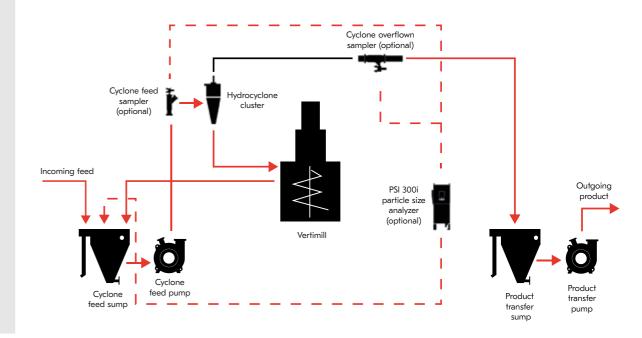
Optimum grind challenge

All beneficiation plants have an optimum particle size fraction for best recovery. Recovery and grade are interrelated and determine the amount of concentrate produced. The best way to affect flotation recovery is to fix the problems in grinding.

Grinding needs to be controlled in a such a way that it provides correct particle size for optimal mineral liberation and highest metal recovery. The main challenge is reaching that optimum grind. Unfortunately, most plants suffer from either under grinding or even worse — over grinding, and both these issues lead to loss of revenue.

Metso Outotec solution

By using a PSI inline with a VFD to control the Vertimill grind, our customers can optimize recovery grade. PSI prevents mill overfilling and reduces need for feed interruptions by calculating how to control all available variables, so that predicted error is minimized, by continuously adjusting all available setpoints and by recalculating controls.



Metso Outotec solution

What is process control?

- Optimization
- Maximized profit
- · Reduced carbon footprint
- Improved overall equipment availability and reduced mechanical wear

APC

- Manipulate base-level targets
- Process models and soft sensors
- Control particle size for optimal mineral liberation
- Hydrocyclone control to prevent roping to enable maximal throughput

Base level control

- · Equipment and process automation
- PID control / ratio control / sequences
- · Adapt to feed changes and stabilize the process
- Adjust mill speed to reduce energy consumption

Instrumentation:
Proposed PSI and VFD

- Valves, pumps, VFDs
- Flow, density and pressure measurements
- Particle size measurement (PSI 300i)
- Hydrocyclone condition monitoring (CycloneSense)

Process and process equipment — installed

- VertiMills
- Flotation cells
- Thickeners
- Filters

Ore - current

- Mineral liberation
- Ore hardness
- Losses in fines
- Impact to downstream processes

Adding PSI 300i provides:

- Information about particle size in hydrocyclone overflow
- Optimal mineral liberation in flotation for increased recovery
- Grinding media attention and mill speed adjustment as required

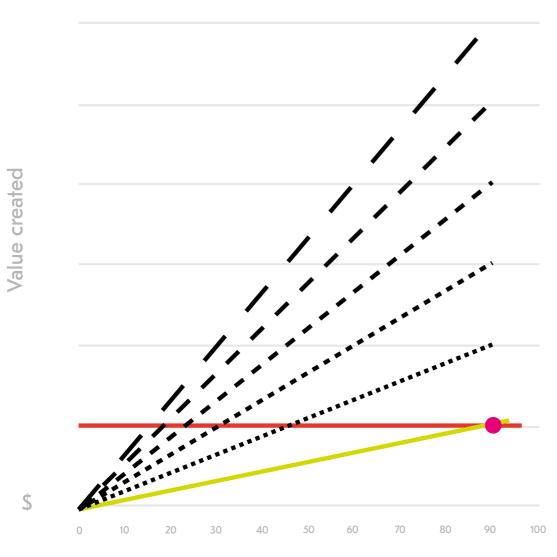
Adding VFD provides:

- A means to change mill operation speed
- Optimization of energy consumption at the start of the mill
- Reduced mechanical stresses during mill motor start up
- A means to change power draw and feed slurry density
- The cost for a WRIM+LRS is similar to a SCIM+VFD combination even for the larger VTMs

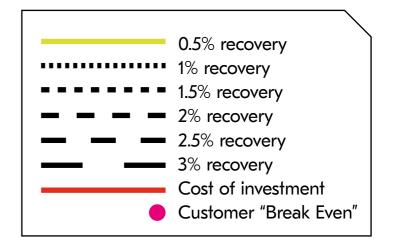
Adding CycloneSense provides:

- Visibility inside the hydrocyclone to prevent roping before it occurs
- Control the hydrocyclone feed pressure, density, and the number of operating cyclones
- Increased uptime and maximized throughput

Customer value and ROI



Increased levels of automation will lead to improved recovery and decreased costs. It provides accurate flexibility because there is 100% more PSD testing per day. The return on investment is extremely quick, it can occur in a matter of weeks. Lastly, there is also the potential for remote monitoring as well as reduced energy consumption.



Number of days

Metso Outotec is a frontrunner in sustainable technologies, end-to-end solutions and services for the aggregates, minerals processing and metals refining industries globally. By improving our customers' energy and water efficiency, increasing their productivity, and reducing environmental risks with our product and process expertise, we are the **partner for positive change**.