CRUSHER AUTOMATION
CASE STUDY

Our Goal:

A client's crushing circuit was controlled solely in manual mode. The operator had the responsibility to control each crusher's belt feeder in manual to maintain crusher's power under a certain set point range.

As a result of a manually controlled crusher circuit and a lack of chocked feeding conditions the crushed recirculating load was high and the crusher's mantle often required constant repair.

Our Solution:

It was determined that the root causes for high recirculating loads were:
- Lack of an automatic control
- Choke feeding conditions not achieved

In order to overcome both issues described above, an automated solution was developed to control each crusher's belt feeder based on power and cavity level constraints on a minimum selection fashion (both PID loops running in parallel at any time but final control based on minimum selection between the two PID).
Both level and power are constantly checked in order to maximise chocking conditions and improve throughput.

Unlocked Potential:

The automation of the crushing control circuit was the first step on regaining controllability of the crushers as well as increasing throughput by reducing recirculation. Further mechanical works were recommended as part of our scope of works.

Liaised with engineers from other areas in order to improve the crusher's operation making sure other mechanical and electrical improvements were followed up and completed.

Key Success Factors

Time — 2 Weeks

Money — $20K

People
1 Process Control Engineer

Tools
FANUC
Cimplicity

Wilson Florez

Co-founder & Director
Principal Process Control Engineer

Key Insight:

"Once implemented, the client was able to more effectively reduce recirculating loads therefore increase production rates without bottlenecking the crushing circuit.
The solution also reduced the amount of time the control room operator had to spend taking care of the crushers operation.

The operator was then able to concentrate in other tasks related to the other parts of the plant."

Identify Opportunities
Crushing circuit was controlled solely in manual mode. The operator had the responsibility to control each crusher's belt feeder in manual to maintain choking conditions and crusher power under a certain SP range

Propose Solution
An automated solution was developed to control each crusher's belt feeder based on both, Crushing power and cavity level using a minimum selector between to newly created PID loops

Implement
Coded both PLC and SCADA to automate the process

Measure
The operator was able to reduce recirculating loads and increase production rates without bottlenecking the crushing circuit.

Communicate
Communicated to all key stakeholders. This solution was replicated across multiple customer's sites across WA