Metso

Case study

Copper recovery improvement with performance-based flotation cell retrofit at Antapaccay

Glencore's Antapaccay is a mining and processing operation producing copper concentrates in Peru. Annual copper production from the mine is expected to be 160,000 tonnes in concentrate form.

Antapaccay's flotation circuit was commissioned in 2012. The operation was expanded in 2019 with a rougher line of five 300 m^3 forced air cells from a different manufacturer. Despite this, there was still room for improvement.

Challenges

- Increase throughput without impact on recovery
- Low head grade feed ore and variability
- Finding a cost-effective solution
- Low concentrate recovery due to a large froth surface area

Solution

- Performance guarantee
- Collaborative solution planning between Antapaccay and Metso
- Increase froth recovery by retrofitting existing cells with a center launder upgrade
- FloatForce® mixing mechanism

Results

- Copper recovery increase in the retrofitted line surpassing expectations
- Production revenue growth
- Operational flexibility due to deeper froth beds and decreased airflow rates
- Reduced energy consumption
- Lower operating costs

Challenge: Increase recovery in the flotation circuit

Antapaccay, a leading mining company, identified room for improvement in their flotation circuit. To tackle these improvements, Antapaccay formulated an action plan focused on identifying ways to increase copper recovery. A pivotal element of this plan was the development and implementation of a recovery improvement roadmap, with a specific emphasis on enhancing froth management in rougher flotation cells..

> We noticed a performance gap on the flotation cells installed in our recent expansion and, after some internal reviews, we move forward to Metso's retrofit with their FloatForce® and Center Launder approach. The collaboration between Antapaccay's Operations, Maintenance and Metallurgy departments together with the Metso team helped us to exceed the strategic objectives we have set for the plant, significantly improving metallurgical performance. Furthermore, the Metso retrofit allowed the stabilization of froth generation and extraction, along with providing operational flexibility and lower energy consumption, delivering sustainable benefits to the plant and reducing operating costs.
>
> **Mr. Antonio Bravo, Metallurgy Superintendent, Antapaccay**

Solution: Metso´s flotation performance–based upgrade

Fast forward to 2023, Antapaccay's flotation process took a remarkable turn. After careful consideration, Antapaccay chose Metso's solution. This involved replacing the existing flotation mixing mechanism and froth management system with Metso's FloatForce® mixing mechanism and Center Launder. The retrofit targeted the last three cells of the newest rougher line.

To maximize economic benefits, Metso proposed a performance-based upgrade, guaranteeing metallurgical performance through a customized process guarantee.

Before vs after comparison

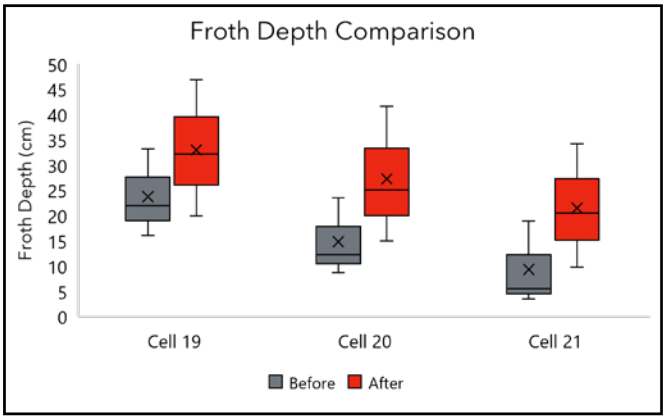
Before retrofit

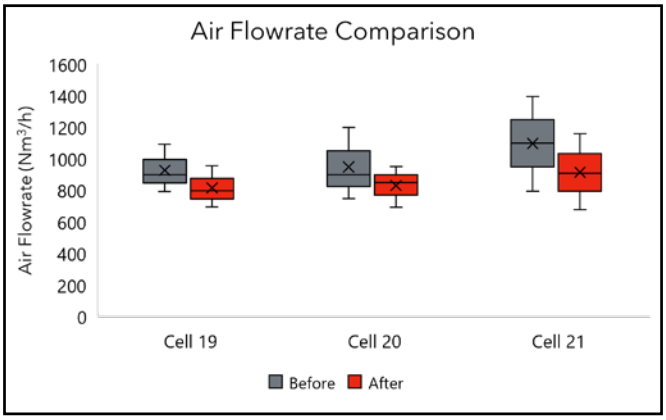
After retrofit

Results: Exceeding expectations and the Planet Positive impact

After the evaluation period, Metso and Antapaccay collaboratively studied the results and concluded:

- Copper metallurgical recovery exceeded the performance guarantee.
- Operational parameters were optimized:
  - Reduced airflow rates while maintaining or increasing superficial gas velocity (Jg).
  - Increased froth beds and concentrated mass pull.
- Direct motor energy consumption reduction, delivering positive sustainable benefits.





Antapaccay's retrofit led to remarkable results, including increased copper recovery and revenue growth. Metso's solution improved operational flexibility by efficiently removing concentrate froth, reducing energy consumption, and demonstrating commitment to sustainability. The collaboration with Metso resulted in operational excellence and reduced environmental impact.

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