

Case study

FLS Gyratory Crusher wear liner optimisation quadruples operating life and delivers sustainability benefits at major gold mine

A large gold mine was facing a challenge many mines often do - Process conditions changing naturally after years of operation. This was putting additional demand on the gyratory crusher. This gold mine decided to aim to optimise the equipment to fit the requirements of today.

Road to increased production

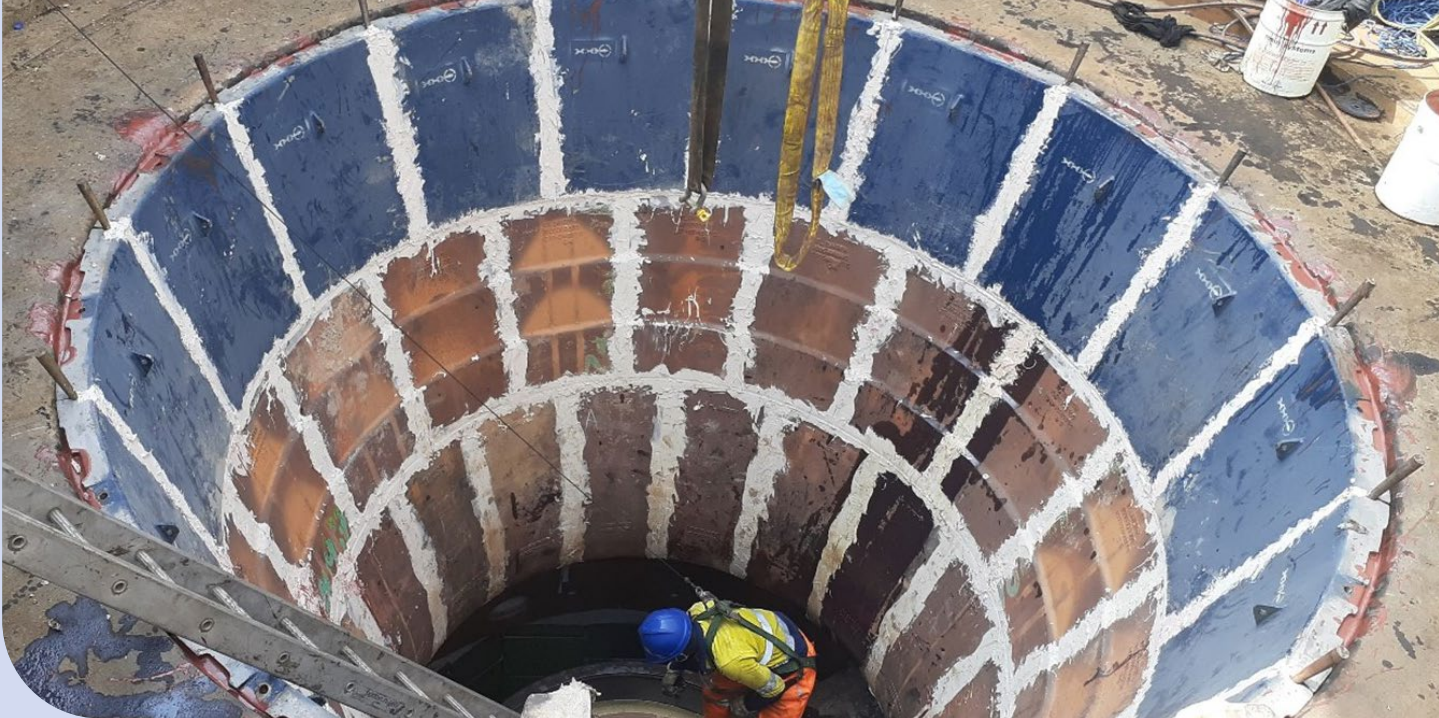
Initial concave liners at the gold mine were achieving throughput of 4 million tonnes until replacement or emergency repair became necessary. However, changes to operating conditions meant that this was no longer suitable. Wear life was 30% to 40% below what was required.

The mine was aiming to increase the lifetime of its concaves to 6 million tonnes and approached FLS, a leading supplier of gyratory crushers, to provide a solution.

Based on analysis of the feed material, and wear and failure analysis, the two main drivers to reach the goal were established to be finding an optimal design and technology. With this in mind, FLS got to work.

"This project was a great example of how at FLS we aim to collaborate with our customers to get them an optimal solution," says Marc Tigges, Director, Crushing Consumables.





The Solution:

Despite restrictions on travel due to the COVID-19 pandemic, we were able to collect additional and detailed behavioural data, thanks to the excellent support received by the customer.

"The travel restrictions were definitely a roadblock, but the fun thing about roadblocks is you can discover something amazing on the other side," mentioned Bartosz.

The customer and FLS agreed on an initial target to reach 6 million tonnes, with a visionary target of 10 to 12 million tonnes. Multiple sets of shape-optimised concaves fulfilled the initial goal of 6 million tonnes, and some even reached 8 million tonnes of throughput before requiring replacement. This interim goal was reached with special-grade manganese alloys.

Even after meeting the initial target, the FLS project team continued to improve the solution. After simulating various combinations of materials, FLS ended up with introducing a new high-end **Metal Matrix Composite (MMC)** concave material. This innovative material was then implemented into the operation, and after collecting data the customer realized the contribution of this new technology to the overall efficiency of the equipment.

The result:

The customer saw significant improvements to not only the wear life of the concaves, but also reaching unforeseen throughput levels.

The wear life of the new MMC concaves gave 4x more wear life and 18 million tonnes, which was 3x the initial target.

Other added benefits included reducing downtime and operational costs due to minimising the required change out and replacement concaves to meet the target.

Another major highlight is around the newfound sustainability benefits. By being able to increase the wear life of the liners by 4x, this will mean one set of liners will do the job of what 4 sets were doing before.

This will result in less waste being produced from used liners, less raw materials being required to manufacture such liners and also reduce the carbon emissions. So FLS helped enable the customer create an overall more efficient operation at many levels.

"Sustainability and MissionZero is always in focus at FLS, and we know this is a top priority for our customers always. When we have solutions that are not only increasing sustainability, but maximising productivity at the same time, that is a huge win,"
- A final statement from Bartosz.

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