

Integrated solutions deliver process improvements

“As mines look for opportunities to mine and process ore more cost effectively and sustainably, integrated solutions will play a growing role,” says Teddy Malunga of Weir Minerals Africa. These can be applied in various on-mine phases from comminution to tailings, with significant commercial and environmental benefits.

Taking in the full scope of factors within any mining challenge or context, integrated solutions are the best way to reduce operational costs and increase throughput, while maximising water recovery and power savings.

According to Teddy Malunga, Regional Integrated Solutions Manager at Weir Minerals Africa, plant performance often drops over time – for various reasons. It may be that the combination of equipment is not optimal, or that the mined material being fed to the plant changes more than expected. The *ad hoc* replacement of individual items of equipment over the years could also lead to an imbalance in throughput capacity. All solutions, though, begin with close analysis leading to a thorough understanding of all the aspects of the circuit.

“When a client approaches us with a challenge in their circuit, we conduct a compre-

hensive audit in which we gather all the data we can on how the plant is currently running,” he explains. “This includes comparing its overall performance to its original design parameters.”

By analysing each stage of the process – and each item of equipment – conclusions can be drawn about where bottlenecks might occur. The solution that is designed should then be aimed at achieving the required key performance indicators such as throughput and target P80 – the particle size at which 80% of the product will be passed onto the next processing stage – while reducing downtime and raising productivity.

With the constant evolution of technology within the Weir Minerals range of solutions, the response to such an audit process usually provides the opportunity to optimise the process and address our customers’ pain points, he notes.



Teddy Malunga, Regional Integrated Solutions Manager at Weir Minerals Africa.

An important element of integrated solutions is the ability to measure where potential equipment under-performance occurs, and to ensure optimal running conditions across the plant. Here, Malunga points to Weir Minerals’ Synertrex® intelligent platform and its ecosystem of solutions. “Measuring wear rates, vibrations and temperatures on a pump in real time, for example, is a valuable indicator of where problems might occur,” he says. “It also creates the opportunity to monitor performance and pick up variations from the expected performance parameters.”

An integrated solution would then also be

able to demonstrate a tangible and measurable improvement to the customer, he adds. Among the potential benefits that would be identified could be improvements in plant throughput, capacity, availability, efficiency, or recovery – and often a combination of these.

An important aspect of system optimisation is to improve energy efficiency, as mines look to reduce their costs and their carbon footprints. Traditional mill circuit flowsheets – comprising semi autogenous grinding (SAG) mills and ball mills – are inefficient, with 40 to 60% of the slurry returned to the mill for reprocessing. This recirculated load reduces the throughput and capacity of mill.

“The redesigned and reconfigured mill circuit that Weir Minerals envisages will see the SAG mill replaced by a more efficient HPGR, which is less energy intensive, while also reducing recirculating loads threefold,” he says. “Compared to traditional crushing and grinding methods, Enduron HPGRs can reduce energy consumption by up to 40%.”

Similarly, the development of Weir Minerals’ Cavex® 2 hydrocyclones allows a 27% improvement of capacity in the latest generation design, with a reduced bypass and better cut-point.

In terms of pump technology, Weir Minerals’ products improve the numbers of hours pumps can run while reducing power consumption. The Warman® WRT® impeller and throatbush combination, is a simple inexpensive upgrade compatible with all Warman® AH®, M and L Series slurry pumps.

“The aim of Weir Minerals’ integrated approach is to understand our customer’s pain points and identify ways in which we can improve their process, which often leads to lower total cost of ownership,” he says. “This

leads to higher availability, throughput and profitability.”

Underpinning its capability in providing integrated solutions is Weir Minerals Africa’s unrivalled manufacturing and service network. It has service centres within 200 km of most major mining regions to ensure the

company can deliver value quickly and effectively to customers.

“In the end, it is vital to take a holistic approach to solving customer challenges, and to be close enough to understand our customers’ operations in detail,” says Malunga.

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The Synertrex intelligent platform monitors performance in real time and indicates where problems might occur.



Enduron HPGRs can crush material to as small as 5.0 to 8.0 mm and they require significantly less water. Their use instead of a SAG mill can reduce recirculating loads threefold.



In response to a client’s challenges, Weir Minerals will conduct a comprehensive audit to gather process data before developing an integrated solution to improve productivity and reduce downtime.



Weir Minerals’ integrated approach is to understand its customers’ equipment to improve their processes.