

# Fast track solution to DRDGOLD tailings recovery project

WEG Automation Africa and WEG Transformers Africa, part of the Zest WEG Group, have shift DRDGOLD's new Far West Gold Recoveries Project into high gear with the commissioning of a containerised substation and control room solution at the Phase 1 tailings site.

**B**usiness development manager for projects and contracts at WEG Automation Africa, Tyrone Willemse, highlights the tight timelines for work conducted on the tailings recovery project, which will see 500 000 tons per month of material pumped from the Driefontein 5 dam through a new 2 km pipeline to the Driefontein 2 plant.

The development of Phase 1 began in August 2018, with first commissioning beginning just four months later, in December 2018. In an unusual step for such a project, the electrical portion was supplied ahead of the mechanical aspects to expedite the contract.

"At the tailings facility, the customer required a medium voltage (MV) substation, a low voltage (LV) substation and a control room," says Willemse. "This was accommodated within a double-container structure, which included a room to house all the free-standing variable speed drives (VSDs) and uninterruptible power supplies (UPSs)."

The container was mounted on a concrete plinth with 2,5 metre pillars elevating the structure to allow optimal visibility from the control room. Heat losses were factored into the design to ensure the substation remained cool and the installation is fitted with a comprehensive fire detection system.

Willemse says an important consideration was to reduce the footprint of the substation,

and using free-standing VSDs allowed this. "Had the VSD configuration been a conventional design these units would have been incorporated in panels and we would have needed an additional container," he explains.

The VSDs are placed against the container wall and are completely isolated from any exposed conductors.

Motor Control Centres (MMC) were also provided for the modifications to the Driefontein 2 plant. The MCC for the thickener is fed by two 1600 kVA transformers and the tailings MCC is fed by one 1600 kVA transformer; both were manufactured at WEG Transformers Africa's Wadeville facility. Significantly, these WEG transformers have a local content of 95%, well over the required 90% specification.

"For this project, the transformers are designed to incorporate the VSD component of the load, and this demonstrates the engineering flexibility WEG Transformers Africa can offer customers in meeting specific operating parameters," adds Stuart Brown, sales team leader at WEG Transformers Africa. "It is not a distribution transformer as such, but rather a VSD-type transformer."

Cooling capacity had to be increased to accommodate the harmonics, and flux density is also reduced. The WEG transformers are built to SANS 780 specification, which stipulates losses even lower than the global IEC



*Above: WEG W22 motors installed on water pumps feeding the heavy duty water spray jets.*

*Right: The two WEG 1600 kVA transformers which feed the MCC for the thickener.*



standard. Brown explains that this will translate over time into energy savings for the customer and is an important advantage.

Fabrication of all MCCs and the adaptations to the container were undertaken by WEG Automation Africa at its facilities in Robertsham, Johannesburg, and Heidelberg, further adding to the high local content on the project. This local manufacturing capability is an integral part of Zest WEG Group's status as a B-BBEE Level 1 contributor.

Particular care was taken with on-site modifications at the plant itself. At the milling and classification MCC extension, WEG Automation Africa was required to connect to DRDGOLD's existing MCCs. The use of joggle chambers on either side of the existing board made for best practice and greater safety. On the return water MCC, a raised plinth was added for easier cable access. Top entry cables for the slurry receiving and tailings MCC was facilitated by innovative board design.

The MCCs incorporate an extensive range of WEG LV products including WEG air circuit breakers (ACBs) to facilitate a 50 kA fault

level, WEG moulded case circuit breakers (MCCBs), WEG contactors, WEG fast-acting high rapid fuses, and WEG motor protection relays.

WEG W22 LV electric motors were selected to drive the tailings facility pumps, ensuring lower energy consumption through the design of these units, which have an optimal cooling fin design. Ingress protection is to IP66, ensuring effective sealing against liquid and dust.

WEG Automation Africa, formerly known as Shaw Controls, recently changed its name to align with parent company, Brazil-based WEG's global strategy. Its local manufacturing operation has been the recipient of an extensive investment programme by WEG that has seen its facilities upgraded as part of the ongoing commitment to the South African economy and customers in the region. □



*The WEG Automation Africa IEC 61439 certified Motor Control Centre in the containerised substation.*

## Improved chairlift safety and ergonomic comfort

In underground sites with steep inclines, long haulages and large numbers of workers, getting personnel to and from their workplace has become an important cost factor. Chairlift systems from Becker Mining South Africa are an ideal solution whenever large numbers of personnel have to be moved safely and efficiently in steep inclines and declines.

Becker Mining South Africa is committed to providing the latest product designs, high manufacturing standards and cost efficiency, as well as enhanced safety and total reliability of their underground transportation systems.

The global mining supplier's chairlift systems are designed to transport up to 900 personnel per hour, quickly, efficiently and safely in all underground applications, including difficult mining conditions.

"Becker's modular, low maintenance chairlift systems, which encompass the latest technology and manufacturing trends, meet stringent quality and safety regulations in the mining sector," says Tom Searle, senior general manager: capital, Becker Mining South Africa. "These chairlifts, with a simple, yet robust structure, are installed in underground sites with steep inclines of up to 45° and long

haulages up to 2 000 m, at drive speeds between 1,5 m/s and 3 m/s.

"In emergencies, the chairlift system can be used for transporting injured workers quickly and safely back to the surface."

Some of the chairlift safety features include a rope slip sensor and a fail-safe brake system which is spring-activated and hydraulically released on the drive wheel brake path. Secondary and primary brakes are capable of holding the entire out of balance load. Other critical safety devices are the passenger override sensor and an intelligent pull key system.

Every chairlift installation is custom-designed to suit each specific application and drive units are selected based on the length and gradient of the installation. The chairlift underground transport systems can be supplied with dependable diesel driven generator sets, to ensure the absolute safety of miners in the event of a power outage.

"We are also responsible for erecting the chairlift drive house, mechanical and electrical installations and all civils work," says Searle, who adds that Becker Mining offers a full range of spares as well as a support service that includes a maintenance and on-site repair service for chairlifts. □



*Becker Mining's chairlift systems, using latest technology and manufacturing trends, meet stringent quality and safety regulations in the mining sector.*