



SEAMLESS FILTER PLATE PACK CHANGE OUT DURING MAJOR OUTAGE AT DEGRUSSA SITE

Meticulous planning of filter pack change out delivers on time, below budget with zero injuries at remote DeGrussa site

Sandfire Resources' DeGrussa Copper-Gold Mine, located 900km north-east of Perth in Western Australia, is one of the Asia-Pacific region's premier, high-grade copper mines. DeGrussa's remarkable progress from discovery in April 2009 through resource drill-out, feasibility, financing

and construction and development – just over three years from discovery drill-hole to first production – has set new benchmarks for the efficient development of resources in Western Australia.

The mine will produce up to 300,000 tonnes of high-grade copper concentrate annually. Following initial operation of the mine, further ore reserves and mineral reserve additions extended mine life to mid 2021.

The vision of Sandfire Resources is to be a significant, mid-tier mining company that operates at the upper quartile of international performance benchmarks for the industry.

CHALLENGES

- Supply and install filter plate pack in extremely challenging timeframe
- Plate pack install was critical item during campaign outage, all other site activity 100% dependent on it meeting deadline
- Remote location

SOLUTION

- Highly disciplined, regular communication focussed on key deliverables and deadlines
- Outotec installation manager dispatched to Finland prior to shipping of plate pack

RESULTS

- Below budget, installed 12 hours early
- Zero injuries

Operations

Commencing with an initial two-year open pit mining operation which was completed in April 2013, the DeGrussa Operation is based on a long-term underground mine delivering sulphide ore to an on-site 1.5Mtpa concentrator.

The DeGrussa concentrator is designed for ultimate performance, with the underground mine allowing simultaneous extraction from multiple faces, providing production flexibility. Outotec had previously partnered with Sandfire, providing key concentrator equipment including comminution (ball and SAG mills), flotation (24 cells), analysers (PSI and Courier) and dewatering (thickening and filtration technology).

Scope

In late August 2015, Sandfire engaged Outotec to supply the upgrade for its Outotec Larox® pressure filter. The new plate pack was to be in SAF 2205, in order to prolong component service life in the high sulphur slurry environment. Scope comprised design, supply, installation and commissioning of all internal operating components. The Outotec team worked closely with Sandfire to deliver not only a robust, optimum design on the upgraded filter plate, but also to ensure the turnkey installation of the unit adhered to the client's critical timeline.

Challenging timeframe

The challenging timeframe from receipt of order to site delivery cannot be underestimated. Normal lead time on

supply of a filter plate pack in SAF 2205 is nine months, but it was required by site much sooner. Outotec received the order on 26 August 2015, with the unit to be on site mid February 2016, a mere seven months later! Additionally, in order to make this already challenging delivery, the unit had to be ready for shipment from Finland on 16 December 2015.

Technical complexity

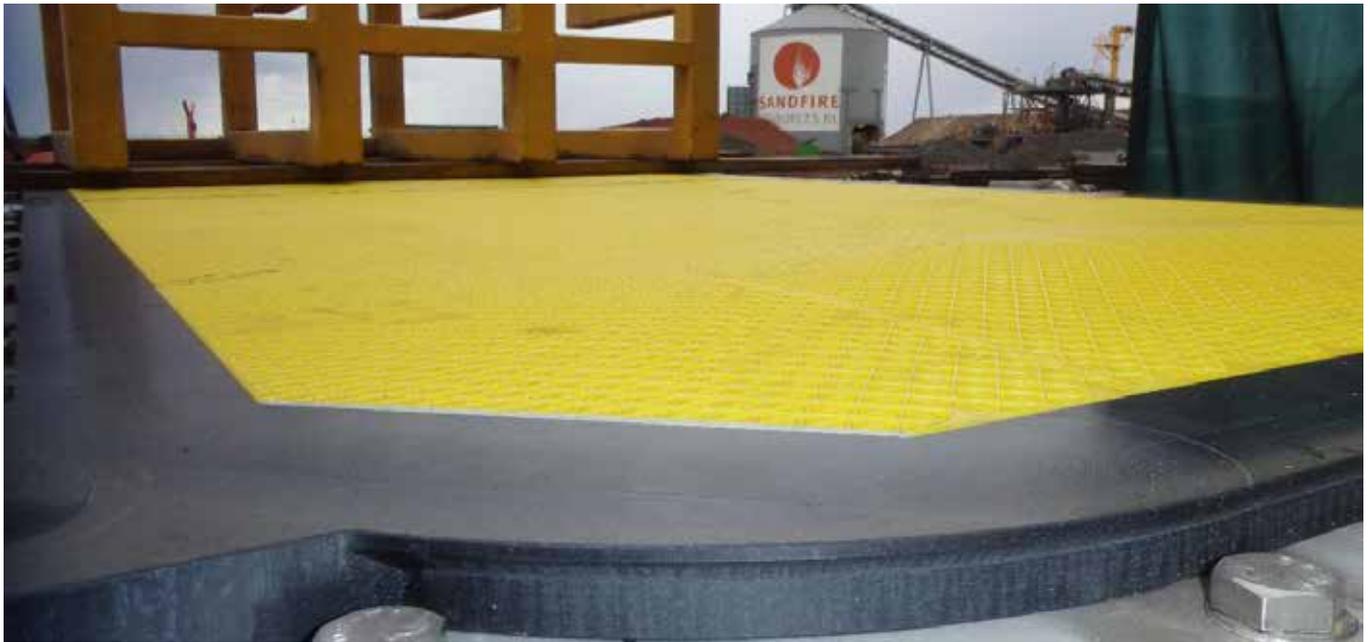
Apart from the additional time to source the individual components of the new SAF 2205 pack, the plate pack manufacturing process itself is technically complex. With SAF 2205, it is vital to very precisely manage the multiple welding processes, including for example, control of component distortion during and post welding, control of heat inputs to prevent destruction of the SAF 2205 corrosive resistance properties. Additionally, post weld passivation of SAF 2205 components is key.

Outotec has an established reputation and extensive experience in the manufacture and delivery of this exotic stainless steel material. Everything in the QA process - the overall plate pack, down to individual nuts and bolts - underwent a rigorous, exacting process to ensure optimal quality for DeGrussa.

With SAF 2205, it is vital to very precisely manage the multiple welding processes



Plate under manufacture prior to weld out.



VAT straightening.

Campaign outage

The installation of the filter plate pack was to occur during a major campaign outage at site, designed to upgrade and maintain other plant elements. One of the longest lead items to decommission and install is the filter plate pack. Its installation was a critical central element during the outage, with other equipment and suppliers dependent on 100% accurate timing. If the filter plate pack was not delivered exactly on the scheduled date or if there were delays during its installation, there would have been severe financial implications to site and disruption to other service providers.

Close communication

Open regular communication was key to ensure the critical time paths were met. Internally within Outotec, we conducted weekly meetings between various project teams in Australia and Finland, covering manufacture, delivery and installation. All possible bottlenecks, risks or delays were proactively eliminated to ensure on-time delivery. Progress updates via QA reporting milestones were then regularly communicated to the customer.

Installation logistics and support

To ensure a seamless and efficient installation, Outotec sent its plate pack installation manager to Finland to oversee optimal packing and logistics of the plate pack.

Every component, nut and bolt needed to be included – particularly given the exotic nature of the materials and a remote site such as DeGrussa where sourcing items quickly would be difficult.

The highly experienced installation manager also ensured the plate pack was organised to facilitate an efficient and seamless install. For example, items which were to be used first in the install were packed last, so they would be

the first to be unpacked at site.

Meanwhile at site, prior to the outage, DeGrussa conducted a full day pre-shut risk mitigation workshop to ensure all key stakeholders, including Outotec, were involved and aware of all relevant details and risks.



Roller installation.

Round the clock commitment by this experienced team resulted in the installation being completed one full shift earlier than scheduled

Installation

On 23 February 2016, as planned, Outotec personnel and equipment were mobilized to site. The Outotec installation manager, plus his team of 16 personnel, split into a day and night shift. Round the clock commitment by this experienced team resulted in the installation being completed one full shift earlier than scheduled, on 4th March 2016. Importantly, the installation by the team of 17 personnel over 1,714.5 hours was also completed with zero injuries at site.

Summary

Despite the extremely challenging timeframe, the filter pack change out at DeGrussa was completed below budget and with zero injuries. Highly disciplined and regular communication was critical to adhering to the demanding delivery schedule. Outotec also sent its plate installation manager to Finland to facilitate optimal packing, and therefore, subsequent installation of the plate pack. The pack change out was completed by a team of 17 personnel one full shift earlier than scheduled.

“Achieving the delivery timeline was critical to ensuring no disruption to the scheduling of planned other major works,” explains John Fraser, Process Manager at DeGrussa. “The plate pack change out was completed without incident, within the allocated time and the filter was successfully recommissioned without any delay to the plant restart and production schedule. Very well managed by the Outotec team.”



Plate mounted in jig for weld sequencing and distortion control.