Most powerful conveyor system commissioned

Europe’s ABB, working with TAKRAF, has completed commissioning and testing for probably the world’s highest-powered gearless conveyor drive system, enabling continuous operations at Chuquicamata copper mine in Chile. Commissioning was completed in four months. ABB has provided engineering design, gearless conveyor drives, electrical equipment for power supply, energy distribution and automation of a new underground and overland conveyor system at the world’s largest open pit copper mine.

Project management and engineering for the full electrical, control and instrumentation (EC&I) scope was led by ABB in Germany, with long spells on site in northern Chile to work side-by-side with TAKRAF to equip the site’s new underground operation with a large conveying system that overcomes an altitude difference of 1,200 m and covers a distance of almost 13 km. The three principal uphill tunnel conveyors.

ABB liquid-cooled MV voltage-source frequency converters, together with large synchronous motors, deliver a decrease in active and reactive power consumption. This is highly energy efficient, and without additional network filters. ABB’s Mining Conveyor Control Program (MCCP) ensures smooth belt operation and safe synchronisation between High Power Motors and High Power Hydraulic Brakes, necessary for secure operation of steep uphill conveyors. The drive systems also work without mechanical backstops.

A novel embedding concept, developed jointly by TAKRAF and ABB, enables straightforward installation and alignment of the GCD motors, saving installation time and longer deployment of maintenance teams. This was considered a major benefit compared to existing GCDs in cantilevered construction. The concept also meant motors were 100% factory assembled and tested. They can also be mechanically disconnected from the drive pulley quickly so operations can continue if drive failure occurs. The total installed drive power for the entire system, including multiple feeder conveyors, totals 58 MW, of which there are 11 x 5 MW gearless synchronous motors.

ABB has also installed ABB Ability™ Ventilation Optimizer at Chuquicamata reducing carbon emissions and providing clean air to workers in line with the strict HSE requirements. The new underground project is expected to extend operations at Chuquicamata for the next 40 years.

Shipping export stockyard control order

FLSmidth has received an order for its BulkExpert™ digital solution from a customer in Brazil. The solution will fully automate the stockyard operation of two large iron ore shipping export terminals in the south of the country. BulkExpert is a digital solution that allows for the unmanned, fully automated and optimised movement of material handling equipment in dry bulk terminals. It does this by using a 3D laser scanning system, RTK-GPS technologies and state of the art control software that processes proprietary algorithms to enable fully autonomous operation.

The BulkExpert order comprises a core digital solution and advanced automation for three stockyard machines at one port and eight stockyard machines at the other (including standalone and combined stackers and bucket wheel (BW) reclaimers). The solution will deliver several clear benefits to the customer, including higher throughput, greater efficiency and increased guaranteed performance. Extended machine life and reduced maintenance can also be expected due to lower stress on the machinery.

High-capacity filters for tailings applications

Metso Outotec’s new Larox® FFP3716 filter comes with compact plate pack design and smart automation, redefining the overall standard in reliability, capacity and safety in tailings filtration. Combined with Metso Outotec’s optimised filtration plant design, the FFP3716 filter offers a reliable and cost-efficient long-term solution for tailings management even in challenging environments. The Larox® FFP3716 uses the most optimum plate pack design, leading to reduced wear on plate pack and cloth components along with ease of operation and spares holding. The new design of the closing and sealing mechanism with individual controlled sealing cylinders ensures a squared plate pack at any time, resulting in long lifetime. Technical features include: 2,000 m² filtration area; 44 m³ chamber volume; Up to 16 bars operating pressure; Smart hydraulic system; Readiness for remote production Application support.

Key data on the GCD at Chuquicamata. Photo: ABB

ABB high power motors in position. Photo: ABB

An automated stacker integrated in a BulkExpert™ solution. Photo: FLSmidth

The high-capacity Larox® FFP3716 filter. Photo: Metso Outotec