Success story | Southern Africa | 2020-06-18

Remote commissioning helps major African sugar mills improve quality, reduce costs‎

Virtual commissioning can be used in a number of different ways without working with physical assets and has several benefits for customers. This technology has the potential to improve operations in nearly any production or manufacturing environment, giving any company a competitive edge.

Three 1.2 MW ACS880 mill drives and one 355 kW regenerative batch centrifugal drive have been remotely hot commissioned at Illovo Sugar Africa’s biggest Southern African mills at Nakambala in Zambia and Ubombo in Eswatini.

These drives were to be commissioned under load in April at start of the crushing season. However, our Southern Africa service team was unable to gain access to the sites after the South African and subsequent Eswatini lockdowns were implemented in late March and early April respectively.

Illovo Sugar Africa had previously awarded the Variable Speed Drives (VSD) contract to ABB for the modernisation of its mills and centrifuges. Included in the scope was ABB’s remote monitoring solution, a condition-based maintenance service that predicts when drive components need replacing.

With operations extending to remote areas across the sub-Saharan African region, condition-based maintenance provides precise, high-quality data that enables the delivery of an efficient, targeted maintenance programme. Analysis is easier and faster, and maintenance activities are planned based on actual need.

Sugar centrifuge applications require one of the highest cyclic overload requirements in industrial motor control. ABB’s superior motor control algorithm DTC (Direct Torque Control) in the ACS880 drive ensures superior response time to setpoint change/load rejection. The ACS880-17 regenerative drive uses the DTC algorithm on both the motor control inverter and the regenerative supply unit, ensuring excellent motor control performance as well as clean and reliable loading on the supply.

These unique control elements of the ABB drive help equipment owners achieve the shortest possible cyclic time, which ultimately results in a high production capacity from the same machine. Not only did the drives exceed the performance on the application, but it also offered a common technology platform across the range.

The easy-to-configure software and user-friendly Human-Machine Interface (HMI) made it simple for the on-site users to navigate through the drive to extract vital application data, while the use of ABB’s unique DTC motor control platform allowed for easy integration with the existing non-ABB motors on-site.

Remote commissioning for these mills required an on-site network to be set up, which was installed by the site personnel under the direction of the ABB service engineer remotely. The remote monitoring hardware (part of the ABB Ability™ Remote Services for Drives product suite) was set up during the installation supervision phase by the ABB drives service department in anticipation of the wet commissioning.

Set-up and tuning of the drives under full load were successfully achieved via a stable NETA-21 VPN connection to the customer LAN. The batch sugar centrifuge is a special application demanding precise parametrisation under load due to very high inertia and high cyclic loading with full regenerative capabilities. The mill tuning under load demands high intermittent overloading and verified no resonances or torque pulsations.

In today's sugar industry, constantly increasing competition and growing pressure for higher efficiency are forcing producers to find new ways to achieve long-term success. ABB’s solution of VSDs, motors, gearing and bearings is indispensable for key processes such as cane milling or beet slicing, extraction and crystallisation, and play a critical role in generating energy savings, improving productivity and reducing costs.

An extremely happy and satisfied customer was able to start-up these essential food services plants without any downtime due to the lockdown. The current partnership between ABB and Illovo Sugar Africa ensures high productivity at its plants, efficient maintenance planning, and avoiding unplanned downtime while maximising the life of the equipment. Illovo, Africa’s biggest cane sugar group, has commended ABB for its proactive approach, solution and commitment.

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