



Efficient Production Restored for Mehran Sugar Mills

One of Pakistan's leading sugar mills had intermittent shutdowns of its centrifuging process costing \$4,000 an hour due to a faulty programmable logic controller (PLC) on a key centrifuge. Sanaullah and Muhammad Anwar of Mehran Sugar Mills Limited explain how ABB technology has restored reliable production, while an electrification project also enables the plant to sell its excess electricity to the local grid.

Mehran Sugar Mills, located around 250 kilometres from Karachi, crushes more than 1.2 million tonnes of sugar cane a year to produce the Chasnik brand of granulated white sugar and Sugarie granulated and powdered brown sugar. In terms of crushing capacity and sugar recovery, the site's recovery rate of sucrose from the cane – at over 11 percent – is among the highest in Pakistan.

A few years ago, there was an issue with intermittent operation of the PLC that controls one of the site's seven sugar centrifuges. This forced a switch to manual operation at reduced capacity and with poor sugar quality resulting in losses of around \$4,000 an hour.

During centrifuging, the massecuite resulting from the crushing, evaporation and crystallization phases is spun at speeds of up to 1,000 rpm, forcing out the liquid and leaving sugar crystals behind. The sugar harvesting season in Pakistan is short, lasting only four months from mid-November to March, and even a single hour of downtime will severely hit output.

New PLC Reduces Downtime

ABB has supported Mehran Sugar Mills Limited since 2008 and its experts were called in to install a replacement PLC, while keeping downtime to a minimum. They created a solution compatible with the old PLC system, using the existing instruments and cabinet. One of the main challenges was that the existing PLC program designed for use with the Human Machine Interface (HMI) was locked. Therefore, a completely new program was created for the centrifuge. The replacement project was completed in just two months



and the centrifuge PLC now works perfectly, not recording a single hour of downtime since the upgrade.

One reason for the success of the ABB PLC is its very robust design, which allows it to operate unimpaired in the moist, sugar-laden atmosphere. The centrifuge has now been transformed into one of the most reliable and robust machines in the Mehran Sugar fleet.

Electrification Generates Extra Profit

There is a large installed base of ABB equipment at Mehran Sugar Mills including motors and drives. Most recently, the company worked with ABB on a fifth mill electrification project to generate electricity using steam produced by burning bagasse - the fibrous waste product left after sugar cane is processed. The steam is used to turn turbines that generate electricity to power the plant and any excess is sold to the national grid. This project, for the conversion of two mills, was executed in 2017 and now all of the motors and drives are online and achieving a power saving of more than 25 percent.

Should all 10 mills at the site become electrified, there is the potential to export 2 megawatt (MW) of surplus electricity to the grid, resulting in an extra income of \$4,000 per day. There are currently 70 operational sugar mills in Pakistan. If they could all be persuaded to follow this lead, then the country's sugar industry might contribute 140 MW to Pakistan's over-stretched national grid.

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