

CASE NOTE

ABB motor and drive package helps a sugar mill to reduce cane-crusher energy use by 40 percent



Switching from an old-fashioned steam turbine to a modern ABB rib cooled motor and drive package on its cane crusher helped Mirpurkhas Sugar Mills in Pakistan to reduce energy use by more than 40 percent.

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Mirpurkhas Sugar Mills

Established in 1964, Mirpurkhas Sugar Mills is one of Pakistan’s leading producers of sugar. The company’s factory in Sindh province in central Pakistan processes sugar cane from 4,500 growers located across three provinces, and has the capacity to crush some 7,500 tons of cane per day.

Since its inception, the company had used steam power to drive the crushing mills used in the critical first stage of the sugar production process. The sugar byproduct bagasse was used to fire up large on-site boilers, with the resulting steam used to spin turbines that, in turn, operated the powerful crusher.

While the system worked, it was old fashioned and not as efficient as it could be. In 2013 Mirpurkhas Sugar Mills began examining options for an electric alternative to the steam turbines, as way of improving processes and reducing power use.

Proven quality and technical expertise

“Thanks to the burning of bagasse, the plant is entirely self sufficient in terms of energy,” explains Muhammad Kazim, sales and support engineer in the Robotics and Motion Division of ABB in Pakistan. “But the plant’s operators wanted to direct the steam that the boilers produce into the powerhouse to generate electricity, rather than having it turn the steam turbines on the crusher.”

Kazim says Mirpurkhas Sugar Mills studied the equipment used in other similar operations in the area and met with various motor and drive suppliers in its efforts to find the right solution. ABB was able to point to similar electrification projects that it had carried out for other sugar mills in Pakistan, and spent two years answering questions from the mill’s operational team about how such a transition would work.

In 2015, ABB launched its new NXR rib cooled motor in Pakistan, and Mirpurkhas Sugar Mills opted to →

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02 High voltage
rib cooled motor,
type NXR

become the first company in the country to have it installed.

“Downtime is critical for a sugar mill,” says Kazim. “Therefore ABB’s reliable single-drive solution was preferred option to operate a crusher mill. Mirpurkhas Sugar Mills’ decision was also influenced by ABB’s global sales support network, proven quality, technical expertise and excellent application knowledge, which ensure a tailor-made motor-drive package.”

Energy savings of more than 40 percent

The NXR motor with ACS800 cabinet drive was commissioned in November 2015 and immediately began producing impressive results in terms of efficiency. While 650 to 700 kilowatts of steam energy were required to drive the crusher mill under the old system, with the new electric solution just 350 to 400 kilowatts are required. This represents an energy saving of more than 40 percent.

“The motor is also less noisy, and one of the most beneficial aspects for the customer is the very high starting torque produced by the motor,” says Kazim. “It’s a very energy efficient motor, which is another big benefit.”

Reliability in harsh conditions

Kazim explains the NXR motor has no problem coping with an extremely harsh operating environment. “At the crusher stage, the cane is de-fibered ahead of pressing, so there are fumes



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and pieces of fiber in the air that could lead to short circuits,” he says. “However, because of the innovative design, there’s no contact between the fiber and the motor’s operating parts.”

So pleased is the customer with the electrification of the crusher mill, it is now looking at replacing the other steam turbines in use at the factory using ABB products. It is hoped this will enable them to save more steam energy and convert it to electricity for export to the power grid.

“The customer is happy and we now have a team working with them on their planning for 2016,” says Kazim.

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