

ARTICLE

Secure voltage supply powers plant operations at Nantong Cellulose Fibers Company



The global tobacco market is in steady decline as smoking becomes less fashionable in the developed economies of the USA and Europe. However, in emerging markets such as India and China, the industry is booming thanks to the cultural changes buoyed by the flourishing economy. In fact, China is the world's largest tobacco market with over a quarter of the enormous population partaking. In 2013, the country's largest manufacturer sold 2.5 trillion cigarettes – that's 43 out of every 100 cigarettes made worldwide [1].

Power-hungry filter production

A key component of a cigarette is the filter, which is intended to reduce the amount of smoke inhaled and absorb some of the chemical by-products produced by the lit tobacco. Filters are made from cellulose fiber extracted from wood pulp (the fiber product is known as the 'tow'), which is then processed into vinegar cellulose diacetate tablets and eventually formed into small cylinders following filtration, spinning and drying procedures. The whole process requires significant reliable power resources to ensure consistency and maximum productivity. Voltage sags and power outages, common in China due to the stressed utility infrastructure,

can cause hundreds of thousands of dollars' worth of damage to plant machinery and its yield.

Powering operations

Stimulated by the thriving Chinese economy, the Nantong Cellulose Fibers Company (NCFC) has expanded its operations five times since being established in 1987. It is the oldest and largest acetate products manufacturer in Asia, producing 20 percent of the world's vinegar tablets and 13 percent of the world's tow/cellulose fiber. It is also a research center for the development of fiber engineering technology.

The 1190 acre site houses 900 employees and was protected from power quality events by large direct current (DC) battery banks on the variable speed motor drives of the fiber production lines. This solution attracted significant maintenance costs and staff resource to remain operational. NCFC needed a solution which delivered a high level of protection for minimal maintenance costs which also offered a higher reliability compared with their existing battery solution.

A reliable low-maintenance solution

Yi Lu, the engineer who is in charge of this project at NCFC explains the issues that the plant faced with their existing battery-powered solution,

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01 The PCS100 AVC-40 installed at NCFC's facility. The system protects the plant's fiber processing line from voltage sags.



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“Each power quality event which causes production to shut down, costs us around \$500,000 USD. We urgently needed a reliable method of protecting the plant which reduced our costs and ensured we were able to remain productive throughout voltage sags and outages.”

Nantong Cellulose Fibers Company chose ABB's PCS100 AVC-40 active voltage conditioner to deliver the advanced power protection the company required, by securing the plant's voltage supply during even very deep sag events. The plant frequently sees drops of up to 50 percent in the nominal utility voltage supply, which the PCS100 AVC-40 can correct in less than 5 milliseconds, to within the tolerance range of the factory equipment ensuring no impact upon productivity.

Lu continues, “We chose ABB's PCS100 AVC-40 specifically because of the efficient way it works, drawing the additional voltage required to restore the power supply, directly from the utility rather than relying on expensive energy storage in the form of batteries. ABB also provided full installation and commissioning support to make sure we take full advantage of the system's features. The training and service provided by ABB was a key factor in our choice of supplier.”

The PCS100 AVC-40 is an innovative solution to industrial voltage supply problems. Providing uninterrupted power without relying on energy storage systems means that the system has a small foot print and is free from the cooling

requirements of battery units. This will allow it to be installed in existing equipment rooms or confined spaces which eliminates the need to design and build added floor space.

Looking to the future

Since the installation of the first ABB PCS100 active voltage conditioner three years ago, Nantong Cellulose Fibers Company has saved over \$1.5 million in lost production and maintenance costs, which has enabled the company to expand its operations and become China's leading supplier of cellulose fiber to the tobacco industry.

With China's economy growing ever-larger, the market for tobacco products is likely to follow suit. NCFC, with its advanced power protection, is well placed to meet the increased demands of its cigarette manufacturing clients who, in turn, will continue to supply China's expanding population.

References

[1] Martin, A (2014, 11 December) The Chinese Government Is Getting Rich Selling Cigarettes [online]. Available from <http://www.bloomberg.com/bw/articles/2014-12-11/the-chinese-government-is-getting-rich-sellingcigarettes#r=hp-ls> [accessed 10.08.15]

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