

## 20th century a.c. drive cuts 19th century carousel costs



Reduced maintenance and two-thirds off the energy bill are the rewards for the owner of a Victorian carousel, after replacing an old d.c. drive with an ABB Industrial Systems ACS 501 frequency converter from Slater Drive Systems. "We decided it was time to bring at least the drive into the 20th century," says George Newsome, whose carousel, at the Beamish Victorian open-air museum in County Durham, is over 100 years old.

The new a.c. drive system was designed and installed by Slater Drive Systems to reduce shudder when starting the ride. This, and the severe mechanical stress on the carousel itself, was caused by a coarse starting technique. A face-plate lever would move over contacts, gradually adjusting the resistive load applied to the 60 year old d.c. motor.

With up to 60 starts per day, this caused strain on the mechanical parts in the carousel, bringing a high level of preventive maintenance and constant worry for Newsome. A breakdown could disrupt the seven days a week operation during the April to September season. "We couldn't afford a breakdown during the season," says Newsome. "The summer income is critical to fund us through the winter, when the carousel is overhauled."

The ACS 501 a.c. drive provides a controlled start facility, meaning that the drive brings the carousel to its maximum speed of 7 rpm from standing start at a steady rate over 40 seconds. At the end of the ride, a pre-programmed speed ramp-down takes the carousel down to standstill over 40 seconds, further alleviating mechanical stress.

*A Victorian carousel, and its owner, have both benefited from the installation of an ABB Industrial Systems ACS 501 frequency converter.*

An unexpected bonus was the energy savings. These savings alone will be sufficient to pay for the entire investment in 3-4 seasons.

Newsome estimates that the energy consumption has come down by two-thirds, saving him around £700 over the season. "I was astonished to see the savings become so substantial," says Newsome. The ACS 501 achieves this by reducing the losses incurred by the face-plate, and by improving the power factor.

The frequency converter also has a number of features that Newsome finds useful. These include electronic speed control, allowing him to keep the speed down if young children are on the ride; and motor overload protection, cutting out the motor if a mechanical part on the carousel should fail. Fairground machinery regulations also require rides to cut out the motor in case of power failure in order to prevent uncontrolled re-start. This feature is pre-programmed in the ACS 501.

In addition, the drive system incorporates a timer, ensuring that all customers get the same 3-minute ride. "Without a timer it is easy to forget how long you keep the ride on for, wasting revenue and energy," explains Newsome.

Two remote panels, one in the middle of the carousel and one outside the carousel, are used to control the drive. Apart from being easier to use, the remote panels allow the frequency converter to be installed in a central service cubicle, denying access to the drive by inexperienced staff.



*Remote panels allow the frequency converter to be installed in the security of a central service cubicle.*

"Old d.c. machinery is very common in fairground rides," says Newsome. "I think this technology could improve productivity in many fairgrounds."

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