



**CONTROL
TECHNIQUES**

COST EFFECTIVE DRIVES FOR WIND POWER

HARBON WIND TURBINES | WIND

DRIVE OBSESSED

COST EFFECTIVE AND EXTREMELY EFFICIENT

Doncaster based Harbon Wind Turbines have created and tested the 60 kW HWT60 variable speed wind turbine and now supply it to the market.

The Challenge

Electrical engineering company, HS Harbon & Sons, went into partnership with local businessman Richard Crowe to set up Harbon Wind Turbines.

The company's aim was to design an advanced cost-effective concept turbine that would outperform the products of established suppliers. For the turbine to be efficient, it needed the ability to change the rotor speed.

The Benefit

"The HWT60 is designed to optimise the blade power output by changing rotor speed to reflect changing wind conditions," explained Dave Harbon, Technical Director.

This is why we use a variable speed drive in regeneration mode to return the generated power to the mains grid. We use Control Techniques drives because their efficiency, considerable programming capability and communications give us the precise control that we need. What's more, the high efficiency drives are very frugal on start-up – using about the same power consumption as an electric kettle."

"Control Techniques has been very supportive throughout the development," added Dave Harbon, "Writing operational software and adding safety features such as automatic braking. The intelligence of the drives has eliminated the need for additional PLCs, making design very straightforward as well as keeping costs down. We think the HWT60 is one of the most cost-effective turbines in the world."

Overview

- **Efficiency**
- **High programming capability**
- **Precise control**
- **Excellent communications**

The Solution

Each turbine was fitted with four Control Techniques AC drives.

Two 0.5 kW Unidrive AC drives were fitted at the top of the tower, one controlling yaw, the other controlling the hydraulics for the braking system, and also acting as an interface to transmit inputs on wind speed, temperature, rotor shaft rpm and vibration to the main drive. Two 75 kW Unidrive were fitted at the base of the tower, working in regenerative mode, to feed AC power back to the grid.

The HWT60 is nominally rated at 60 kW but it can exceed this for short periods. It is 'Class 1 rated', meaning it is approved for use in locations anywhere in the UK and is designed to withstand gales in excess of 150 mph. Depending on the site, a payback on the initial investment can be expected in just four years.

