QUEENSLAND BULK HANDLING

HUGE COAL HANDLING OPERATION VALUES SD700 FEATURES

Based at Tiwai Peninsular, New Zealand Aluminium SQueensland Bulk Handling Pty Ltd (QBH) operates the 10 million tonne per annum capacity export coal loading facility at the Port of Brisbane in South East Queensland. This terminal has been loading coal for New Hope and other producers as a common user facility since 1983. New Hope owns 100% of this business.

Power Electronics SD700 variable speed drives are used extensively throughout the process.

QBH were having blocked chute issues due to the length of time the conveyors were taking to stop when fed from the end Chain Reclaimers. This caused downtime and delays when loading vessels.

Power Electronics were asked to review the application with the SD700's already installed, and propose options to stop the conveyors more quickly. DC injection braking can provide limited braking torque however calculations showed it was inadequate for this application. Traditionally Dynamic Brakes and resistors or a regenerative braking system would be the next options considered.

"This is a great feature of the SD700 Variable Speed Drive as we have been able to deal with the regeneration without the need for dynamic brakes, braking resistors and the necessary room to store them."

Peter Bowen, Maintenance Superintendent, Queensland Bulk Handling

However the SD700 has a unique feature capable of reducing braking time by up to 30% without the requirement of a braking module, resistors etc.

Motion Control Algorithms (MCA) in the SD700 VSD allows separate control of the Motor Torque and Flux Currents. The regenerative braking component of the MCA "Motion Control Algorithm" is composed of two main control blocks.

1. DC Bus regulation: The torque current is used to control the DC bus voltage level. By controlling the amount of energy regenerated to the SD700 it avoids an overvoltage trip during deceleration.
2. Controlled motor losses: The flux current is used to increase motor losses and still maintain magnetic flux at a constant value. As this only occurs during deceleration there is no impact on energy costs

The drive settings were adjusted to incorporate the regenerative braking feature and the delays due to chute blockage when loading vessels were eliminated.

SD700 Series

VARIABLE SPEED DRIVE