

Coal Loader Down Under Depends on Control Techniques Drives



AC drives from Control Techniques feature on a new shiploader installed at the Dalrymple Bay Coal Terminal in the port of Hay Point, Queensland, Australia. The massive shiploader serves a total of 14 mines in Central Queensland including Blair Athol and is part of Babcock & Brown Infrastructures expansion plans.

The coal terminal unloads about 15 - 18 trains a day at the nominal rate of 5,500 tonnes per hour, for export to Japan, China and India, amongst others. The recent Stage 6 Expansion, added a new berth and the installation of the new ship loader to the existing 2 berths/2 shiploader combination, increasing capacity to 56 million tonnes pa.

The coal loader, weighing 1030 tonnes and 49 metres high, was built on the Brisbane River and moved by a heavy lift ship to the Dalrymple Bay Berth No 3. The operation was synchronised to coincide with a low tide to give a mast clearance of just 2.5 metres under the Brisbane Gateway Bridge!

Control Techniques Australia was awarded the contract for the control of all variable speed AC motors on the machine by contractors Clough Downer JV. Control Techniques solution was for a scheme whereby all drives communicated with a PLC via DeviceNet, with encoder feedback giving closed loop motor control and all drives featured additional on-board processing.

“Despite the size of the coal loader, space for drives cubicles was limited,” says Ananda Sebastian, managing director of Control Techniques Australia Pty, based in Sydney.

“The client was pleased with our solution based on Unidrive AC drives and drives and switchgear were mounted back-to-back in specially designed compact cubicles. We had to commission the drives for the boom before it left the dock in the Brisbane River so that the boom could be lowered to pass under the Gateway bridge. Once installed at Dalrymple Bay, we completed the final commissioning, which was completed very quickly to the client’s full satisfaction.”

The 7,200 tonne per hour shiploader travels alongside a berthed ship on rails on a 200 metre wharf (1 of 3) fed by a 3.8 kilometre long jetty, the longest bulk coal jetty in Australia. Reach across the width of the holds is provided by a shuttling head on the boom to ensure even loading and a telescoping loading chute minimises the generation of dust. This chute can direct coal through 360° around the hold to make sure the hatch is fully and evenly loaded.

The telescopic chute winch system features two 55 kW Unidrives, one for position control, one in regenerative mode, to feed power back to the supply during braking. The boom luffing winch is a 500 kW regenerative system, with three Unidrives power sharing and a further three in regenerative mode. The 55 kW boom shuttle winch system is also regenerative with a position control Unidrive and one in regen mode.

The long travel of about 200 metres along the berth is provided by 28 motors controlled in synchronism by four 160 kW Unidrives with a further four units giving power regeneration.

Using feedback from the drives’ software to the controlling PLC via DeviceNet, the PLC controls the reeling of the cable and hose reels to maintain a constant feed angle on the cable and hose whether reeling in or paying out.

Control Techniques has the capacity to deliver drive solutions for both new crane projects as well as retrofit installations. With our qualified specialist drive engineers, based in key global regions, we are able to provide high quality assistance to Port Crane OEMs and Port Operators with optimised electrical drive solutions.

KEY BENEFITS

- COMPACT SIZE
- COMMUNICATION OPTIONS
- ENCODER FEEDBACK
- ON-BOARD PROCESSING
- ZERO HARMONICS, ENERGY EFFICIENT REGENERATIVE SYSTEM



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