

Application Profile

Crane Refurbishments Deliver Improved Performance and Accuracy with Parker Drives



A crane control refurbishment project at Clydeport's Hunterston terminal relies on Parker AC890 series modular systems drives to deliver pinpoint control in the unloading coal from vessels. The massive crane can lift up to 36 tons of coal in a single grab, with operators able to reliably, accurately deposit their loads into the dockside hopper, even in the inclement Scottish weather and winds of 40mph or more.

Clydeport operates Scotland's main West coast ports, with Hunterston located on the Clyde Estuary in north Ayrshire providing a world class bulk coal facility. Hunterston has the natural advantage of having one of the deepest sea entrance channels in Northern Europe, does not have to be dredged on an annual basis and is flexible enough to cope with the very largest vessels afloat - up to 350,000 tons.

Clydeport port management company to handle coal.

The long travel dockside cranes at Hunterston are among the largest in the UK, but at over 30 years old their control systems were beginning to show their age. Relying on mechanical brakes and thruster brakes, operation could be a nerve-wracking business in the typically challenging weather conditions. In addition, mechanical wear and damage were an on-going



Formally known as the Hunterston Ore Terminal, the facility was built on reclaimed land in the late 1970's by the former British Steel Corporation to land iron ore and coal, the raw materials for the Ravenscraig Steel Plant (Motherwell). Ravenscraig closed in 1992 and the terminal was bought by the Glasgow-based

problem, with squaring of wheels and worn out tracks. Modern ports demand absolute efficiency and demurrage - the compensation paid to the owner of a vessel which has been delayed in port beyond the agreed time - can be considerable.

To inject a new lease of life into



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the cranes, Clydeport decided on a major refurbishment of the cranes and their control systems and put the project out to tender. Among the keys to success would be the ability to integrate seamlessly with the existing Ward Leonard field control system and to provide regenerative braking with an active front end (AFE) tied to the dock power supply. The former would maintain Clydeport's

braking. Yates comments: "AC drives normally dissipate braking energy by using dynamic braking resistors. However, crane applications can operate much more efficiently with an active front end. Here the drives are connected to a common DC bus where the overall system shares the line's energy, with the active front end providing a clean, efficient method to regenerate the drive's braking energy

crane. "The AFE regenerative braking allows a lot of energy to be dissipated very quickly, giving very accurate control even in heavy winds," says Yates.

The crane can lift up to 36 tons of coal in a single grab, raising it 100ft or more out of the vessel and into a dockside hopper, which feeds the coal onto a conveyor system away



"The operators find the refurbished cranes much easier to drive, which gives them more confidence and boosts unloading efficiency"

own engineering personnel familiarity with the system, giving them increased confidence, while the latter would be key to increased controllability and energy efficiency.

The tender was won by Stockport based system integrator T&M Machine Tools, with owner Tom Yates developing a control system built around Parker's AC890 Series Modular Systems Drives with AFE technology for regenerative

directly back into the line as required."

Each of the crane's legs has four 50 HP motors. The control solution developed by Yates divides these into eight paired sets, each under the control of an AC890 drive. Yates worked closely with Parker to develop the AFE regenerative braking system, with the full regenerative operation giving the crane drivers pinpoint joystick control of the traverse movement of this massive

from the dockside. In a business where speed is critical if demurrage is to be avoided, the Hunterston terminal boats unloading speeds of over 2000 tons per hour, ensure a quick turnaround for carriers. "The operators find the refurbished cranes much easier to drive, which gives them more confidence and so helps to boost unloading efficiency. They can drive the crane faster, confident that they have the pinpoint accuracy of traverse movement. Even in high winds, the cranes can perform electronic acrobatics," says Yates. "Also mechanical wear is significantly reduced, so maintenance is simplified and further potential for demurrage is eliminated.

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