

## Mexican Port Cranes get New Lease of Life with Cutting Edge DC Drives



**Advanced DC drives from Emerson Control Techniques in America have been selected by Terminal de Contenedores de Yucatán (TCY), to modernise the control system on an ageing ship-to-shore crane in Progreso, México.**

TCY, owned by Grup TCB of Spain, is the most important container and cargo-handling terminal in Mexico's Yucatan peninsula. When the terminal commenced operation in 2005, the two Panamax Starporter ship-to-shore cranes, manufactured by Star Iron & Steel of Tacoma, Washington State, USA were already nearly thirty years old.

Seven years later, keeping the cranes operational had become difficult due to increasing downtime and escalating maintenance costs. David Asensio, Project Manager for Grup TCB, commented at the time: "The cranes are in good mechanical condition, but poor electrical condition". Replacement parts for the old DC drives had become nearly impossible to find and could take weeks to obtain, leading to unacceptable downtime.

For this application, Emerson Control Techniques proposed an all-new, fully integrated drive and control system featuring its Mentor MP DC drive. Mr. Asensio explains, "After reviewing the competition, we decided that Emerson Control Techniques has the best DC drive. The Mentor MP DC drive has a rugged design that is easy to maintain, a matter that is sometimes not taken into account. For us, Emerson is the right solution."

Emerson Control Techniques' new control system encompasses all the electrical equipment including low-voltage auxiliaries, DC drives, PLC, I/O, crane management system and MCC. Also included are new remote I/O and control stations, RF Ethernet-based remote diagnostics, and a modern rotating operator's chair and consoles to replace the old sliding chair and fixed consoles.

### KEY BENEFITS

- RUGGED DESIGN
- EASY TO MAINTAIN
- RELIABLE, FLEXIBLE AND POWERFUL
- MAXIMISES MOTOR PERFORMANCE

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This cost-effective Emerson Control Techniques solution provides TCY with a higher degree of reliability to increase uptime, a rapid supply of spares and remote monitoring and diagnostics to facilitate troubleshooting and maintenance.

For the hoist (which utilises a 373 kW motor rated at 50 tons and has a speed of 45 metres/min) a 120 amp Mentor MP was selected. The 55 kW trolley, with a speed of up to 120 metres/min and the 55 kW boom with a maximum speed of 6 metres/min share a 210 amp Mentor MP, which is switched between the two. The eight 14 kW, 45 metres/min gantry motors have their duty shared between four 105 amp Mentor MP DC drives.

The Mentor MP is a reliable, flexible and powerful digital DC drive designed to maximize motor performance, enhance system reliability and interface digitally with the latest control equipment using Ethernet and a wide range of industrial networks. This makes the Mentor MP an ideal solution for modernizing port cranes and equipment.

The drives feature a series of user-configurable functions (master-slave management, electric shaft function, digital or analogue feedback, torque control, etc.) that are arranged logically in different menus and preconfigured with default values to facilitate commissioning.

The operational parameters can be selected and modified from the drive keypad or through the Windows based software CTsoft. The SM-Application module is an easy plug-in second processor, capable of writing application specific programs without needing to use a PLC or stand alone controllers. It is programmed using SyPT, an IEC 1131 compliant programming tool incorporating function blocks programming.

The SM-Application modules of the two drives that operate the hoisting motors and connect via Control Techniques' own high-speed network CT-net, use a load balancing function to control container hoisting and calculate the maximum lifting speed as a function of the load hooked to the spreader. With the spreader empty, the SM-Application modules enable movements at the maximum programmed speeds.



In this case, crane productivity is maximized by using a series of bespoke basic, modular and open-ended software packages, developed by Control Techniques specifically for crane control. These are programmed into the PLC and onboard SM-Application modules, and connected via fieldbus, optimising movements in order to relieve the operator of these delicate and repetitive tasks.

Hoisting, trolley, boom and gantry movements are all driven by DC motors that are controlled by means of Mentor MP digital drives connected via a Profibus network to a controlling PLC.

Control Techniques also designed the Crane Management System integrated into its basic software and enhanced with control modules for the maintenance guide and diagnostics. Operational at the various levels of automation, these software packages automatically signal events as they occur, guiding the operator in manoeuvres and assisting technicians with repair and preventive maintenance operations.



For further information please visit  
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