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CASE STUDY NOTES

Drives and Automation

Crane Drives and PLC Replacement

Obsolete Drives & PLC replaced on Ladle Bay Cranes.

Following a previous project in 2010 where Drives and Automation were engaged to provide a turnkey solution to upgrade the existing slipring motors to inverter control and provide a complete PLC control system, we were again asked to update the Drives and PLC as age and obsolescence were now a concern for the customer.

The previous project had used Control Techniques Unidrive SP / SPM Inverter modules, which had proved themselves to be well suited for the role, and as a result it was decided to follow the Control Techniques upgrade pathway to M700 Drive Control Modules, Inverters and Rectifiers; with smaller standard M700 Drives being used for the hoist and cross travel functions.

The now obsolete SLC5 PLC System was replaced with a CompactLogix 5380 PLC and new HMI's were also provided.

The 250T hoist utilises dual motors and inverters, with the inverters configured to ensure mechanical load sharing.

The main Cross travel, auxilliary cross travel and long travel inverters are configured to control their respective motors in closed loop vector control.

The long travel is driven by four motors, located at each of the four corners of the crane. The motors are driven by two inverter drives.

Each hoist motor features an absolute encoder to provide both motor speed and motor position control. Absolute encoders provide extremely accurate feedback of motor position thus allowing the motor / drive combination to be capable of providing software hoisting limits.

The software programs used for this application include:

- Torque Proving
- Brake Proving
- Hoist position and display on the HMI screen
- Provision of software limits for the hoist position and calibration.
- Cross-travel speed
- Watchdog function
- Speed selection inputs.

Unidrive M700 delivers maximum machine throughput through greater control with single and multi-axis network synchronization. Onboard real-time Ethernet (IEEE 1588 V2), advanced motion control and high speed I/O for position capture enables machine builders to easily create more sophisticated and flexible machines. The onboard Ethernet is also compatible with EtherNet/IP, Modbus TCP,

and Real Time Motion over Ethernet (RTMoE) for network flexibility.

The Control Techniques Commander M Series Inverter Drive combines efficiency and reliability to offer optimum performance for a wide range of applications. With many essential features built in, including PLC capabilities for simple programming needs. The Drive has

a dual STO safety function, braking transistor and PID control, and it provides a compact solution for any installation.

Drives and Automation (DnA), based in Chesterfield, provide a comprehensive system design, control system manufacture and project management service for new and retrofit control systems.

Working alongside machine builders or end users, we provide systems encompassing AC and DC drives, PLC systems and turnkey project solutions.

Problem Solved

- Existing drive control system difficult to maintain
- Control system obsolete with poor availability of spares
- Extended downtime and loss of production
- Expensive to maintain

Solution

- Modern drive solution
- Existing motors retained
- Control system reliable & supportable
- New PLC Machine Control
- Comprehensive control system documentation provided

Benefits

- Downtime Reduced
- Production Increased
- Easy to Maintain and Fault Find
- Easy to Support

Technical Details

- Installation of modern Control Techniques M700 Drives
- Up to date drawings and documentation
- Simplified diagnostics
- Minimised downtime

www.drivesandautomation.co.uk

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