

UPGRADE OF STATIC CUT-OFF MACHINE SLASHES DOWNTIME AT CORUS

A replacement for a complex and unreliable control system for the Static Cut-off machine at Corus Pipes, Hartlepool has dramatically improved machine reliability and throughput at the works.

“The existing Mannesmann Demag system was obsolete and unreliable, with no support,” comments Dave Watt, Senior Electrical Project Engineer at the plant with responsibility for the project. “The reliability was poor with the software and documentation difficult to follow. Replacement was needed urgently, but was far from straightforward. We asked Drives and Automation Ltd to recommend a solution and they put forward a scheme featuring drives and servos from Control Techniques.”

Corus Tubes produces large steel pipes up to 24” in diameter at the Hartlepool plant. The overall plant efficiency is reliant on the operation of the Static Cut-Off machine which provides test samples of the finished pipe product for QA purposes.

The replacement control system designed by Nottinghamshire based Drives and Automation comprised a Control Techniques Mentor II M350A cutter drive, two Control Techniques Unidrive SP 18.5kW servo-drives and new Control Techniques servo motors. Each servo axis contained

a Control Techniques SM applications module to provide position control over each X and Y axis as well as high-speed communications using CT-Net. Cutting profiles for each product were generated and stored on the SM Apps module with programmes being selected via a touch-screen. A PLC and touch-screen HMI were provided for operator control / menu selection.

Finished tubes are fed into Static Cut-Off machine by a set of in feed conveyors. The pipe is gripped by clamps and a circular cutter head with tungsten carbide tips mounted on the inner diameter is rotated by the main cutter motor at a speed defined by the product. The X and Y axes move the rotating cutter blade, using two servo motors, in an ellipse around the pipe, thus cutting into the pipe and providing the sample required. Profiles differ for each tube diameter and wall thickness and each motion profile is pre-programmed into the SP Applications modules. The whole cutting process takes a matter of seconds.



KEY BENEFITS

- INCREASED THROUGHPUT
- IMPROVED RELIABILITY
- SIGNIFICANTLY REDUCED DOWNTIME
- STRAIGHT FORWARD SET UP PROCEDURE & OPERATION
- SIMPLIFIED MAINTENANCE



Interfacing to the existing machine was fundamental to the success of the project since only two weeks were available to install and fully commission the system.

The original system used a PC to store the NC programs. The replacement system utilises a touch-screen / PLC to store the basic data required for each programme. The operator simply enters the required pipe size and depth of cut manually via the screen for each product, much simplifying the set up procedure.

The existing servo-motors were replaced with new Unimotor FM servo-motors, chosen to be perfectly compatible with the Unidrive SP servo-drives and providing a similar speed and torque profile. The system included the supply of sin / cos absolute encoders on the servomotors, giving precise position control at all times, and allowing a simplified datum routine to be carried out.

The project utilised some of the many powerful features of the Control Techniques Unidrive SP drive including the absolute encoder inputs, secure disable, CT-Net high-speed communications and the single axis motion controller built into the SM Applications module.

The system was successfully installed and commissioned in the allocated time and went into production to specification and on time.

The Unidrive SP AC variable speed drive range spans 0.37kW right up to 1.9MW. Unidrive SP is the world's most advanced 'solutions platform' AC drive, configurable into five operating

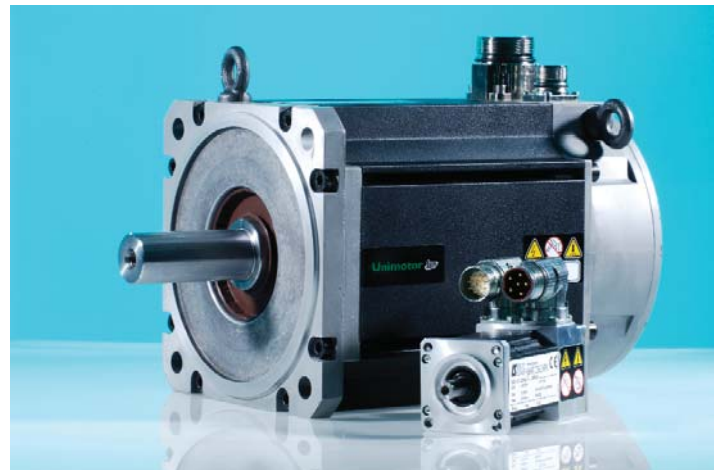
modes – open and closed loop, vector, servo and regenerating modes - connectivity to most industry standard networks and accepting most position feedback protocols. With a range of plug-in module options, its on-board PLC can be supplemented, as in this case, with programmable and specialist feedback and communication modules.

Dave Watt, concludes:

"Drives and Automation Ltd provided a complete drive package to replace a very complicated' obsolete control system. The equipment was provided on time and successfully commissioned within the shutdown. The system has run continuously ever since its installation and never missed a beat. We are very pleased with the local support."

As well as repeatable machine performance and simplified operation, the installation has significantly reduced downtime and simplified maintenance with built-in diagnostics. The potential bottleneck has therefore been removed and the long-term viability of the plant ensured.

Drives and Automation Ltd is an independent company, expert in the design and application of complete automation systems, utilising AC Inverters and DC variable speed drives, PLC and SCADA. They offer custom panel design and build, AC Inverter and DC Drive modules plus associated equipment, including encoders, braking resistors, along with experienced service/breakdown support and fast turn round drive repairs.



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