Aluminum Paint Line

A Metals Case Study

The Application

An aluminum manufacturer of building and construction industry products had experienced strip-tracking difficulties resulting in line “crashes” and poor strip quality on its 22-year-old paint line. A crash not only took the line out of production, but also resulted in a large amount of scrap material. Recovering from a crash is a time consuming operation. Outdated equipment made it difficult to make process improvements. An engineering study identified the need for improved tension control in order for the line to resume running at its original design speed.

The overall project consisted of several smaller projects that were a combination of an:

- Electrical controls upgrade
- Mechanical modifications
- Integration of purchased subsystems
- Installation, planning, and execution

Implementation of these improvements had to be made with minimal disruption to the production schedule.

The PCT Solution

PCT was asked to replace the paint line’s existing bridle roll drives, motors, and gearboxes in order for it to operate with improved tension control.

The PCT Solution

In addition, PCT provided:

- Programming of a new controller to integrate the new drives into the existing line control.
- Reassignment of the master bridle function to improve tension isolation between line sections.
- Mechanical and electrical design and installation of four load cell systems for tension feedback and monitoring.
- Mechanical and electrical installation and commissioning of two ultrasonic coil diameter sensors and control units, located at the payoffs, for the rage brake and unwind tension control.
- A new center guide system for the rewind mandrel to improve wrapping accuracy and to accommodate increased line speeds.
- Specification and installation of a new hydraulic unit to meet performance requirements of the new center guide system.

PCT provided the engineering, design, hardware, and documentation necessary to install new DC drives, DC motors, and gear reducers. The new drives were installed in the existing drive control cabinets in order to keep project costs down. New motors and gear reducers were supplied with the necessary coupling and mounting bases, allowing for easier installation in the existing bridle locations. PCT also provided programming, tuning, and commissioning of the new drives and motors.

The aluminum manufacturer's plant manager is pleased with the process improvements that PCT's engineering team provided within a short and demanding project schedule. Improved tension control, resulting in the reduction of strip-tracking difficulties, has improved product quality and has allowed the paint line to meet and exceed production expectations.