Case Study:

Paper Mill Upgrade

Quad Plus®

75-year-old single line paper machine using outdated methods was ready for an overhaul.

Objective

- Upgrade and update paper machine to improve speed, flexibility, and safety.

Solutions

- Sectionalized the drives from the wet end to the reel.
- Installed an AC coordinated drive lineup featuring a master controller.
- Installed two HMIs to provide a centralized location to monitor and control processes.
- Added an I/O, safety processor, and safety-rated VFDs to boost safety.

Results/Benefits

- The customer enjoys higher operational efficiencies, improved sectional control of the machine, and easier thread up.
- By automating processes previously completed manually by operators, a younger, more inexperienced workforce can operate the machines and focus on value-adding areas of operation.
- The paper mill will enjoy less downtime for maintenance of the machine.
- Centralized monitoring and controls will allow for more efficient, flexible operations.
- Workplace safety conditions are improved.

Background

A midwestern paper mill specializes in limited runs where frequent grade changes are necessary. They needed more flexibility to meet the demands of its customers that include a wide variety of paper types, from construction paper to crepe. Their original paper machine is more than 75 years old, and 15 years ago, our team was able to extend its useful life by replacing the original line shaft steam turbine with a DC motor. However, design changes driven by market demands have led to a more thorough discussion about the most cost-effective methods for controlling the speed of the machine and its various sections.

Quad Plus Solution

The Quad Plus team started with a thorough analysis of existing equipment and careful consideration of the paper mill's customers. Our experts have years of experience sizing the coordinated drives of a paper machine according to TAPPI standards, and our solution included sectionalizing the drives from the wet end to the reel and installed an AC coordinated drive lineup with a master controller supplied by the mill's preferred PLC vendor.

We then provided a system to aid in the speed regulation of the entire machine and its various sections. With the addition of two HMIs (computer screens with graphical representations of the machine), operators could utilize a single, centralized location to monitor and control the process. To improve safety, we also added an additional I/O, safety processor, and safety-rated VFDs.

Before the upgrade, the speed and draws of the machine were performed manually by operators using potentiometers. By automating the line, the current workforce is able to focus on value-added areas rather than operation, and the younger, more inexperienced workforce can come on board as the automation helps to ease training concerns. Lastly, the line shaft and the DC motor replacement will help the mill enjoy less downtime for maintenance.