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Retrofitting



Drive system retrofits breathe new life into older lines

One of the quickest ways to make an older line... well, quicker, is by upgrading the controls and drives from analog to digital, as

By Managing Editor
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these two real-world examples show.

Intertape Polymer Group

As Intertape Polymer Group, Inc., (IPG) coped with an aging coating line, they needed to determine whether to retrofit the existing line or purchase a new one. IPG's high-performance tapes and cloths are designed for aerospace, automotive and industrial applications. The company couldn't afford *not* to be up-to-date.

At the IPG manufacturing facility in Danville, VA, the older coating line with its dated analog drive and control system was clearly showing its age. Production levels were trending down-

The digital upgrade gives an automatic boost to efficiency –for less.

ward, downtime was up, and splicing was not reliable.

In deciding whether to retrofit or buy new, managers took cost, timeframes, downtime, production impact, efficiency, output and speed into consideration. After much deliberation, IPG committed to the upgrade, as a new acquisition would cost at least eight times more, the company estimated. Ultimately, IPG also decided to turn the retrofit over to an outside systems integrator. While economically this was an easy choice, finding an integrator and completing the job inside a three-month window would not be so easy.

Step on it!

IPG sought an integrator who could provide a turnkey solution. This included designing and installing both the electrical and mechanical portions of the project, as well as commissioning the entire line. The integrator needed to be well versed in the subtle nuances of web conveyance and splicing. Many integrators would not consider the risk of such a stringent mission.

After an intensive search, IPG awarded the project to Circonix Technologies (Ringwood, NJ). Circonix had experience in the web-converting industry, the ability to provide a turnkey solution, and the skill to commission the line.

Time was tight. It was early November 2003 when the proposal was accepted by IPG. There were only nine days of downtime allotted to perform the physical upgrade. Circonix had to complete engineering, manufacturing, testing, and

procurement of all hardware, and be on-site by early December.

The upgrade included: a new 13-drive AC-vector drive system; new drive trains complete with AC-vector duty motors, gearboxes, pulleys, belts, and welded drive stands; complete conversion of the unwind and winder turret indexing from single-speed motor contactors to variable-speed drives; redesign and installation of new slip rings to accommodate the increase in electrical load; new tension controls; a new AC motor-control center; new 480-V AC and 120-V AC power distribution for the machine; integration of third-party systems with the new systems; and two new operator consoles, complete with touchscreens to replace hardwired pushbuttons.

Better splicing

The Circonix team chose AC-vector technology to replace the existing DC technology. DC motors with analog tachometers and cooling blowers were replaced with AC-vector duty motors with encoder feedback and totally enclosed, non-ventilated frames.

Speed regulation was greatly improved, resulting in better tension con-

trol and winding quality. Also, motor maintenance was dramatically reduced (no more brushes to change or motor over temperature trips due to clogged air filters on the cooling blowers). Digital AC-vector drives ensure consistent repeatable performance regardless of fluctuations in ambient temperatures—no more potentiometers to tweak.

Another benefit of AC drive technology is the improved power factor of the overall drive system. This saves IPG money every day by helping them avoid power-company surcharges.

IPG was dealing with splicing reliability issues and uptime problems. Circonix was able to address these issues using a proprietary algorithm known as SPLICE-PRO. Fitted unwinds perform a clean splice with a guaranteed 99.5-percent success rate, minimal waste left on the expiring roll, with consistent short tail lengths and no decrease in line speed.

In conjunction with SPLICEPRO, Circonix also implemented SPLICE-TRAK. This technology automatically synchronizes the winder with the unwind, ensuring that the newly made splice is either the last wrap on a freshly wound roll at the winder, or the first wrap on the core

of a new roll at the winder. This is a very versatile option for IPG.

To complete the modernization of IPG's coater, new custom painted operator consoles with desktops were installed. Each console was fitted with a WonderWare-based Operator Interface Terminal with touchscreen.

Once on-site, the Circonix team executed the job within the allotted nine-day machine downtime. The upgrade commenced on December 26, with deliverable product coming off the line on January 8. Most significant was the overall result. The project team was able to increase the coater's productivity by more than 50 percent by increasing its speed and splicing performance.

"Circonix was able to put it all together for us, meet all of our electrical and mechanical requirements in a very stringent time frame, and actually get us up and running one day ahead of schedule," says Dave Inman, process engineer for IPG. "They were able to meet and exceed our expectations in many ways. Most importantly, we significantly increased our operational line speed, drastically reduced downtime and dramatically increased our Overall Equipment Effectiveness." ■



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