Contouring Lighting Control

Scott Jordan, Product Manager, Commercial Lighting Control, Square D/Schneider Electric

Albany International Creates Savings With A New Strategy

Albany International has saved over $300,000 since taking a new approach to its lighting control strategy back in 2002.

Increasing energy efficiency and cost savings in an industrial facility often comes down to a keen understanding of the manufacturing process, and contouring an appropriate strategy to maximize available opportunities. Case in point is the Menasha, WI, facility of Albany International Corp., a worldwide manufacturer of paper machine clothing, where a unique lighting control strategy was implemented in 2002 during a lighting retrofit.

A New Philosophy

The success of the strategy— which provides either schedule- or operator-based lighting control in each area, depending on the work being done there— can't be denied. The facility has saved more than $300,000 due to the lighting retrofit, including $65,000 in the first year. The company opted to use Schneider Electric's lighting control system, the Square D® Powerlink® NF2000G3. The strategy was so successful that it was applied to Albany International's [1] new facility in nearby Kaukauna, WI, which opened in 2007 and uses the Square D Powerlink NF3000G3 Web-enabled lighting system.

"A large facility like ours typically includes a number of manufacturing cells and warehousing," says Dan Steves, Menasha facility plant engineer. "The old school way of lighting was to treat it as if it were one giant warehouse, where the lights were all on or all off. That doesn't make sense.

"We applied the philosophy that lighting should be distinct and separate from other

energy-supply circuits. What we ended up with was factory and office areas that have properly designed lighting systems."

Distinct Manufacturing Areas

Albany International's Menasha facility manufactures forming fabrics for the paper industry. A forming fabric is essentially a very large, endless belt, woven from specialized synthetic yarns that is used in the forming section of a papermaking machine. The size and structure of a given fabric are based on the intended product of the papermaking process, whether it's tissue, cardboard, or other paper grades. Each fabric progresses through the same process steps, with lighting in each area coordinated by the controller:

- The first step is weaving the piece, based on customer specifications, on one of multiple looms.
- From there, it goes to an inspection area, where it is cleaned and examined.
- The next step is the heat-setting area, where the fabric is stretched and then heated to size and stabilize the fabric. It is then cut to length to allow for seaming, where the two ends are joined together.
- Finally, the fabric is rolled, boxed and shipped to the customer.

In 2002, Steves was planning his facility's lighting retrofit, primarily to change out metal halide fixtures and T12 fluorescent fixtures. The process was going to require rewiring, and thus new lighting panelboards, so the decision was made to purchase the new lighting control system. Subsequently, Steves and Eric Bauer, currently plant engineer at the Kaukauna facility, developed lighting zones to maximize energy savings, and software that would allow workers in appropriate areas to turn lights on and off based on workload.

Scheduled Or Operator

Curt Swinford, loom operator at Albany International's Menasha, WI facility, prepares to turn a loom's overhead lights off using a touch screen display.

When a weaving loom operator starts a new fabric, he proceeds to a console and taps a touch screen display to turn lights on over the loom he will use. Because the Menasha facility is a 24-7 operation, lights over a loom stay on until the fabric

weaving step is complete, which can take up to several days. The operator is then responsible for using the console to turn off the lights over the loom.

The inspection area has a different work week, so lighting is on a schedule there, automatically turning on at roughly 6 am and off at the end of the work day. Lighting control in the heat-setting area is tied into the activation of the finishing machines there. Like the weaving area, an operator uses a console to turn the lights on over the heat-setting machine he will use, and then uses the console to turn lights off when he's done. Finally, schedule-based lighting is employed in the shipping area and runs from 7 am, to when the last fabrics scheduled to ship are sent. There is a push-button override in case of late arriving or departing shipments.

The Menasha facility also has a raw material storage area that is on a lighting schedule from 6 am to 2 pm, but an override button allows workers to turn lights on there for two hours if new material is required. A controller facilitates a lighting schedule in the office area, while occupancy sensors turn lights on if someone works late or comes in early. Schedules for the parking lot lights are built into both controllers.

Find The Right Fit

The Kaukauna facility is also a 24-7 operation and part of Albany International's Engineered Fabrics division. It uses a number of looms to weave endless belt products out of brass, stainless steel and synthetic filaments for conveyor systems, filtration/erosion control, and other industrial uses. Because the facility opened at the end of 2007, Bauer is still implementing his lighting control strategy, but says it is similar to Menasha.

"With six-lamp fixtures in the manufacturing area, I will write software into the machine consoles so operators can choose to activate two, four or six lamps," he says. "That maximizes our energy and cost savings opportunities, but also operator comfort; some operators just don't want that much light."

In other areas, schedule-based lighting is more appropriate, such as the sizing/heat-setting department, which runs on a different schedule.

Doing Your Homework

Steves says lighting control can create savings in other areas, such as lamp replacement. Most lamps are rated for 25,000 hours, he says, and keeping lights off up to one-third of the time can extend the relamping cycle substantially.

But implementing an effective lighting control plan requires homework on the front end: "The first thing to do is see if you can automate or integrate lighting control with your existing system," Steves says. "Then you should determine how much you could reasonably expect to save using a lighting control system, and then calculate whether the return on investment is acceptable. Typically, corporate management will tell you 'if it doesn't pay for itself within three years, we don't want to do it.'"

Scott Jordan joined Square D/Schneider Electric in 1978 and has worked in the company's lighting control business since 1992. He has a bachelor of science degree in electrical engineering from the University of Kentucky.

Source URL (retrieved on *09/23/2014 - 12:39pm*):
http://www.impomag.com/articles/2008/02/contouring-lighting-control?qt-recent_content=1

Links:
[1] http://www.albint.com/web/albint_pub.nsf/content/splash+page