Exopack, LLC, is a plastic film manufacturer located in Thomasville, N.C., and operates on a 24-7 schedule. In the hot summer months of 2000, the plant experienced shutdowns of its plastic extruders and process chillers. These shutdowns resulted in significant loss of production while the extruders were purged and restarted. Also, the plant needed to expand production by adding manufacturing capacity that required 150 kilowatt (kW) of power.

The plant’s Director of Engineering, Bill Traywick, contacted an electrical contractor to change out the existing switchgear. The contractor recommended installing a second 2,500 amp main breaker to double the service. When the contractor requested a second 2,000 kilovolt-amp (kVa) padmount transformer service from Duke Energy, we recognized this request was unusually large relative to the equipment being added and capacity in our existing equipment should have been sufficient.

At the time, the plant was served with a 2,000 kVa transformer. The customer’s switchgear was rated at 2,500 amps. Several times production experienced costly shutdowns as the main breaker tripped on excessive load current while the transformer was reported “overly hot.”

After finishing our preliminary analysis of the electric load characteristics, we knew the demand was not high enough to cause the transformer to overheat. So, our power quality engineers investigated the tripping problem and high temperature of the service transformer.

Our experienced Duke Energy specialists collected load data history and determined that the operating load of the connected equipment was normally between 1,000 and 1,100 kW. Logically, the existing electric service should be capable of supplying both the current equipment and the additional production capacity planned for the plant. Upon completion of the analysis, we determined that the plant’s electrical power factor was unusually low.

Exopack: Needed to solve unplanned production shutdowns and was concerned about adding capacity to an existing electric service that was problematic.

Concerns: What will the upfront costs and ongoing maintenance be?


Why it works: We design, install, program and maintain electrical infrastructure systems. We have the expertise and knowledge that is required to provide proven, cost-effective solutions.

Traditional approach:
- New electrical equipment: $75K
- New Duke Energy equipment: $30K
- Process downtime: 2 Days
- Ongoing Duke Energy charges: $6K

Duke Energy’s Recommendation:
- New electrical equipment: $40K
- New Duke Energy equipment: $0
- Process downtime: None
- No other ongoing charges

Results: Duke Energy’s solution saved Exopack:
- $35,000 in capital costs
- $6,000 annually
- 2 days of lost production worth over $480,000

The solution also solved nuisance production shutdowns worth over $100,000 per year.
THE SOLUTION

Duke Energy specialists concluded that it may be possible to eliminate the problem of the overheated transformer, stop the production shutdowns due to nuisance breaker tripping and supply the plant expansion from existing electric service if the operating power factor was improved to a reasonable level. It was recommended that we design and install internal plant power factor correction capacitors. This equipment minimized Exopack’s capital cost and needed no maintenance. The plant had decisions to make.

Should they follow the recommendations of the electrical contractor? This would require a large capital investment for the new main switchgear and internal wiring plus a monthly charge for a second electric delivery and additional transformer from Duke Energy. And there would be two days of process downtime to install the new service.

Should they follow the recommendations of Duke Energy specialists? This meant improving the operating power factor by installing internal power factor correction capacitors. This saved $35,000 in capital costs, avoided $6,000 in annual charges for a second electric service and required no maintenance. In addition, the plant continued to operate during the installation avoiding a two-day plant shutdown worth over $480,000. Exopack avoided missing any production commitments and had additional monies to invest elsewhere in their business.

After careful financial and technical consideration, Bill Traywick weighed the initial costs, downtime and ongoing maintenance. The solution was simple. He took Duke Energy’s trusted advice.

THE DETAILS

Our engineers oversaw the installation of the internal capacitors. Extensive monitoring and testing was performed to check the design and later confirm its proper operation. The solution was implemented with simplicity in mind. The internal capacitors needed no additional floor space as they were small and hung on the wall. They required no ongoing maintenance. In operation, plant power factor was improved so the existing electrical system was able to carry the increased production equipment. Nuisance electrical interruptions causing production shutdowns were eliminated.

Let us be your energy partner.

THE RESULTS

Even when more traditional options are available to meeting a customer’s needs, our Energy Services team is often able to offer better alternatives to traditional solutions for our customers.

This created a win-win situation for both Exopack and Duke Energy. Our expertise in designing the installation of the internal capacitors and our extensive monitoring and testing afterwards were critical to ensuring proper operation of the plant’s equipment and meeting the customer’s expectations.

We apply proven, cost-effective solutions to meet our customers’ needs. Our personnel have the technical knowledge and experience to engineer, design and test electrical systems and operational practices to improve manufacturing performance. While we realize there is no single technology or approach that is always the answer, we do know how to apply available and proven technology to meet the customer’s needs. And with Duke Energy’s century-old name and reputation, rest assured we will be there to back up our solutions.

EXOPACK AT A GLANCE

Exopack’s roots are over 100 years old. The company offers one of the broadest product offerings in the flexible packaging industry, enabling supplies to industrial and consumer customers with a vast variety of paper and plastic packaging options while delivering unparalleled customer service, innovation and value.

Exopack’s headquarters (Customer Resource Center) is in Spartanburg, S.C., where it serves as a full-service product development facility, capable of providing extensive laboratory testing and graphics support services.

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