CASE STUDY

Facility Design

Puckett Engineering, PLLC
THE CRITICAL DIFFERENCE BETWEEN OFF AND ON

Akzo Nobel Coatings, Inc.

Nashville, TN

The Akzo Nobel Performance Coatings Plant needed to add a “Rapid Supply Unit” (RSU) process. The RSU process will replicate the plant’s complete performance coatings process on a smaller scale for fast turnaround and smaller orders. The process includes mixers, extruders, mills, and supporting equipment. A QC lab, QA lab, and office space were also included for the RSU process. The electrical service for that area of the Plant was being supplied by a bank of aged utility transformers that were susceptible to failure. In addition, the electrical service was a corner-grounded delta, which is not ideal. Puckett Engineering was retained for the planning, design, and construction administration for replacing the electrical service and supplying the RSU process and supporting equipment. Puckett Engineering’s solutions included the following:

- The project began with an initial study to evaluate the existing electrical service and options for upgrading or replacing the service and switchgear and preliminary budget estimates for the project’s electrical construction costs.
- Collaboration and coordination with the utility company.
- Planning the phasing of the project to avoid production downtime.
- Replacement of electrical service.
- Replacement of main switchboard.
- Metering on Main Switchboard and Distribution Panel for measuring and recording power, energy, and power quality parameters, including access via the Plant’s local area network.
- Arc Flash Reduction Maintenance System (ARMS) included at Main Switchboard and Distribution Panels to reduce arc flash energy.
- Surge protection in replacement switchboard.
- Recommended line reactors for process equipment motor drives.
- Refeed existing capacitor bank and evaluate potential harmonic resonance conditions. Provisions included to replace capacitor bank with a filtered capacitor bank.
- Fault current study to determine short-circuit ratings for electrical equipment.
- Coordination study to determine settings for replacement switchgear devices.
- Arc Flash study for identifying PPE levels at electrical equipment.
- Power and controls for process and support equipment, including mixers, extruders, mills, dust collectors, and HVAC equipment.
- Coordination with European process equipment manufacturers.
- Lighting for RSU process, labs, and office spaces.
- Fire alarm devices in the RSU areas, connected to the existing fire alarm system.
- Data cabling and outlets provided for process equipment and RSU spaces.
- Provisions included for access control and PA systems.
- Construction admin services, including coordination, equipment submittal reviews, site observations, and closeout documentation.

PROBLEM OR NEED

Addition of Rapid Supply Unit Process

PUCKETT SOLUTIONS

Initial Study to evaluate options and budgeting

Replace Electrical Service.

Switchgear replacement.

Arc Flash Reduction

Switchgear networked metering capabilities.

Surge protection.

Harmonics evaluation.

Planning and design to avoid production downtime.

Coordination with European equipment manufacturers

Mills

Year Completed: 2016

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