

PROCESS FILTER & SOLIDS HANDLING

Problem: A customer required two additional filter presses, a dryer and conveying equipment to increase chemical production. The new equipment required integration with an existing filter press, PLC, and other existing process equipment.

Solution: Project Technologies & Services (PTS) worked with the customer to design the cake conveying system. Multiple design options were presented to the customer to determine the best layout for their needs. These designs included: demolition drawings, layout drawings, and elevation drawings. PTS also reviewed drawings, control logics, and inputs and outputs provided by the customer and equipment suppliers.

To determine the best method for conveying the filter cake, tests were organized by PTS for screw augers and pumps. PTS established test protocols and engineers were on site to observe the tests. From the tests, it was determined that the best method for conveying the cake was with screw augers. The tests results helped PTS develop specifications for the auger system.

Knowing the conveying method, PTS was able to design a central surge tank for storing filter cake. The hopper will hold material prior to the dryer, so the customer will be able to run another reactor cycle while the dryer catches up with the material built up in the hopper. The central hopper will store material from the batched unloading of the filter presses while allowing for a continuous feed rate to the dryer.



Screw auger trials

PTS reviewed the electrical distribution and power usage of the building to determine if the existing capacity would support the new equipment and to review the accuracy of the single line drawings. The power consumption was recorded for three feeds into the building over the course of six days. Based on this power study various options were presented to the customer to upgrade their system to allow for the addition of the new equipment and to ensure the electrical system was up to code. The single line drawings were updated from the existing drawings and field verified.

PTS worked with the customer's controls engineer and process engineers to create a document of PLC inputs and outputs. This document included a brief description of the controls logic, which was integrated into the existing PLC program.

Caustic and reactive chemicals are stored in the building. PTS developed floor lining specifications based on chemicals used in the building, lift truck traffic, and other considerations.

The customer had two existing dryers that were replaced by one, new, larger dryer. PTS designed a support structure for the dryer and provided the customer with the necessary drawings.

PTS created P&IDs for the process showing existing and new equipment. The P&IDs included: the existing feed system, the filter presses, the augers, the hopper and the dryer. All P&IDs were reviewed and approved by the customer.

Once the P&IDs were approved, PTS met with the customer to determine any preferences for the equipment. From the P&IDs and customer preferences, PTS provided equipment lists for all of the portions of the project. Quotes and contact information was also provided for various local suppliers of the equipment listed. The customer used the equipment list and design documents to coordinate the purchase and installation of the new system.

PTS was in constant communication with the customer to review the design process. Cost estimates were created by PTS to evaluate costs for options within the scope of the customer's budget.