

Examples of Industries Served

- Centrifuge Manufacturers
- Pellet Mill Manufacturers
- Heavy Machine Manufacturers
- Irrigation Equipment Manufacturers
- Tool and Die Manufacturers
- Food Service Companies
- Medical Equipment Manufacturers
- Medical Researchers



Case Study

Opportunity:

A customer needed an effective low cost solution for providing control in a wastewater application centrifuge. They envisioned two variable speed drives to control the centrifuge's two motors. The operator could then control the process and the clean-in operation through speed regulation of the drives. They hoped for a solution that would allow the operator to start the machine, adjust speeds for optimal performance, and then perform the clean-in operation to end the process. Controlled Motion Dynamics would provide the expert technical know-how to make this vision a reality.

The customer provided the theory of operation that would meet their needs:

- The main motor would start and ramp up to a typical running speed of 1800 RPM.
- The back motor would start and ramp up to a typical running speed of 1800 RPM.
- When the motors reached operating speed, the product pump motor would be enabled to run.
- The operator would then adjust the speed of the main and back motors utilizing potentiometers to optimize the process.
- After all the product was consumed, a clean in process procedure would be initiated by the operator. A pump would provide clean water to the system while the motors ran at reduced speeds at with periodic reversal of the motor direction. This procedure would last 2-3 hours and require constant attention by the operator.



The customer made only the following requirements regarding components:

- The main motor should be 25 HP.
- The back motor should be 10 HP.
- The pump motor should be 2 and ½ HP.

Solution:

Controlled Motion Dynamics developed a system reducing operator dependency. Utilizing the motor drive technology developed by Baldor Electric, and the programmable Logotron relay from ABB, the heart of the system was in place. Other control components came from ABB. In observance of efficiency, safety and reliability Controlled Motion Dynamics proceeded to develop a system that not only met the customer's requirements, but automated the procedure to a level beyond the customer's expectations. The resulting product enabled high quality operation with minimal operator attendance.

Design and Implementation:

- The Baldor series 37 Encoderless Vector drives provided solid control with smooth acceleration and constant torque capabilities for the two motors.
- As requested by the customer, speed regulation was achieved and controlled by two independent potentiometers.
- The ABB Logotron programmable relay controlled the process and was programmed by Controlled Motion Dynamics personnel. The selection of mode of operation, either run or clean in process, was determined by a selection switch with a separate start and stop to control the operation.
- The operator could then fine tune the system utilizing the two potentiometers and the machine would then run continuously with minimal tending by the operator. This setting was essentially unchanged after the initial setup and reduced or eliminated further setup time. The pump would only be enabled by the condition that the two motors were running at speeds that allowed for few, if any, overloading conditions of the waste product.
- The most significant aspect of the control came from the clean in process procedure. Instead of a time consuming process with high dependency on human operation, the ABB programmable relay eliminated the need for operator attendance and provided all the controlled sequences desired for proper operation of this particular procedure. The operator to perform other tasks rather than spending his time on a cleaning procedure.

Controlled Motion Dynamics built the control system and tested and verified the operation for the customer.

- The new system saved labor through the programmable relay.
- The solution was both low-cost and user-friendly.
- The customer had all the desired control they needed and an easy method to change speed, time, and direction for any motor at any time.
- The unexpected bonus of automation was welcomed and appreciated.

As with all projects that Controlled Motion Dynamics develops, we made sure that the system performed at or better than what the customer specified.

