



Pressure Controls Bring Good Things to GE

August 1996 - The Euclid Lamp Plant in Cleveland Ohio is one of General Electric Company's original light bulb manufacturing facilities. Part of the building dates back to the days of Thomas Edison, whose portrait hangs in the main entrance.

A variety of manufacturing processes require low pressure air, provided by three 100 hp multi-stage centrifugal blowers discharging into a common header. In order to insure production quality it is critical to have the air system maintain constant pressure. Because of fluctuations in production, shift changes, etc. the air demand is constantly changing, making manual control impractical.

GE Supply Co. knew that applying Variable Frequency Drives (VFDs) to the existing blowers should provide better control and significant energy savings. Based on projected savings the Euclid Lamp Plant installed three GE AF-300C drives in 1995.

Unfortunately, the control system for the blowers and drive was not able to meet the system needs or take advantage of the VFD capabilities. Supplied by a local systems integrator, it incorporated conventional strategies: P-I-D control for discharge pressure, pneumatically operated inlet valves, and speed control for the VFDs. This system was unable to accurately maintain discharge pressure. Automatic operation of multiple blowers was not possible. Changes in system demand caused frequent blower surge and required manual intervention to prevent blower damage and restore air flow.

Eventually GE called on their blower representative, BissNuss, for assistance. BissNuss recommended that the system be replaced with an integrated control package engineered and provided by ESCOR.

ESCOR eliminated the inlet butterfly valves and added discharge check valves on each blower. Thermal dispersion air flow transmitters were installed on each blower to provide accurate control and surge protection. The existing pressure transmitter was reused, and three existing pressure controllers were utilized to offset differences in demand between branches. The VFDs were re-tuned by GE Supply with ESCOR's assistance. Finally, a motor operated blow-off valve was added to allow safe blower operation during periods of low air demand.

The new control panel employs ESCOR's unique floating control algorithm for pressure, speed, and flow control. All the required logic for the three blowers is programmed into a single GE Fanuc 90-30 PLC. An LCD touch screen provides a graphic display of operating data and system tuning. Full manual overrides are provided, and surge shutdown is provided in manual and automatic operation.

A tight schedule was required to implement the new system during normal plant shutdown. ESCOR had less than a week for testing and system start-up.

The new system is a complete success. The controls hold system pressure to within ± 0.1 psi and provide automatic operation of multiple blowers. The energy savings potential of the AF-300C VFDs are fully utilized. The plant's electrician, observing the motor amperage, initially thought the display was inaccurate because he "never saw it that low before". Because of the tight control the pressure setpoint was reduced by 10% for even greater savings. ■

For additional information contact Bill Grabo of GE Supply Co. at (216) 778-6449. For more information about ESCOR's services contact Tom Jenkins.