Woodstone Energy
INGENUITY FOR INDUSTRY

Case Study – Compressed Air

Client – Manufacturer – Cincinnati, OH.

Project – Compressed Air Retrofit.

Situation – The Cincinnati Ohio facility operated 600 horsepower of compressed air supply despite a recent down size in site requirement. There was also limited reserve for emergencies and routine servicing.

Solution - Woodstone Energy conducted an in-depth analysis and measurement of the compressed air system performance and trended the actual demand. The system study result indicated a varying Production demand that would be more effectively served with a smaller compressed air supply system. The study documented the existing compressed air system to include a single 600 horsepower centrifugal design air compressor and a heatless regenerative air dryer. The existing compressor provided very little turn down for low demand requirements and the air dryer design represented one of the largest compressed air consumers at over 315 SCFM. Additionally, the system demonstrated operating pressure deviations of +/-5 PSIG and an average operating pressure of over 100 PSIG.

Production requirements included routine pneumatic components such as actuating cylinders and valves. There is also a filter press operation which includes large peak instances and causes the dynamics in operating pressure which were recorded.
The system retrofit included installing a single 350 horsepower rotary screw air compressor with variable speed design. This provided enough supply capacity to meet high Production requirements and efficient delivery for low demand instances. Additionally the air compressor is equipped with a heat of compression design air dryer which meets dew point requirements and consumes no compressed air. Further system modifications include utilizing existing storage with downstream pressure regulation. This enabled stable, efficient pressure delivery while utilizing stored energy to meet peak instances.

End Result – The Woodstone Energy compressed air system retrofit provided an energy reduction of 2,131,669 kWh per year. Annual energy savings were calculated at $153,480 per year. Placing the 600 horsepower compressor in stand-by provided reserve compressed air supply back-up for service needs and any emergencies. This avoided typical annual air compressor rental costs of over $50,000 per year. This project delivered a 65% reduction in annual compressed air system operation cost.

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