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CAGI
Compressed Air & Gas Institute

CASE STUDY

Case Study – System Controls

SITUATION: A large public utility electricity provider was faced with an ongoing problem. The utility, which serviced 93,000 retail and wholesale customers, had five air compressors at one power generation facility. Four of the units were always on-line, and the fifth was back-up. Whenever one of the four operating units went down, the long delay in starting the back-up unit almost always resulted in a significant reduction of the compressed air system operating pressure, which caused electrical service interruptions to their customers.

SOLUTION: The utility asked the manufacturer of their air compressors to review the system. The team analyzed the facility and suggested a reconfiguration that included adding a master controller to the compressed air system. With some minor modifications, the newly installed controller began monitoring and directing the various components within the system, including compressors, dryers, and drain valves. The controller allowed the operating hours of all compressors and air treatment equipment to be equally divided amongst themselves. Furthermore, the controller had a single set point pressure setting of 85 psig, eliminating the previously required, multiple cascaded set points for each individual compressor. The system controller would instantaneously sense the failure of any of the on-line units and start the back-up compressor immediately.

OUTCOME: The system controller, with its single point pressure setting, reduced the system operating pressure from 100 psig to a stable 85 psig, resulting in an immediate seven percent reduction in power consumption. Maintenance costs were reduced, and equipment life was extended due to the fact that lower operating pressure places less strain on the equipment. The system controller made possible and automatic the sequencing of the equipment to achieve equal run times amongst all components. This allowed the implementation of a preventative maintenance program as scheduled down time was now possible. System reliability improved as unscheduled breakdowns were significantly reduced, and when they did occur, the system controller would start the backup compressor before system pressure degraded to the point of interrupting electric generation.

This case study provides a textbook example of how a properly installed and configured compressed air system controller can reduce energy, increase reliability, and reduce operational costs. As with all compressed air system upgrades, it is wise to begin the project with a compressed air system assessment that is performed by a trained, compressed air professional. The data that this assessment will provide will allow the user to make informed decisions based upon facts rather than upon guesses, rules-of-thumb, and gut feelings.