



WHEN ASKED ABOUT THEIR COMPRESSED

AIR SYSTEM REDESIGN PROJECT, LARRY

BENANTI, ENGINEERING MANAGER FOR THE

MERCURY NEWS SAID, "OUR SYSTEM IS

PERFORMING BETTER THAN EVER AND THE

ENERGY SAVINGS HAVE EXCEEDED OUR

EXPECTATIONS."

## Newspaper Increases Production and Saves Energy with a Compressed Air System Retrofit

The San Jose Mercury News needed to upgrade its compressed air system to support a planned increase in production. As part of the project to expand their newspaper printing plant, staff made a commitment to improve its energy efficiency. Mercury News's consultant, Air Perfection, monitored and evaluated the existing system and estimated future air demand, and proposed a retrofit project to meet air demand and improve operating efficiency without adding new air compressors. Mercury News staff turned to a statewide investor-owned utility sponsored energy efficiency program, Savings By Design (SBD), for help in confirming the savings potential and in offsetting implementation costs.

### The San Jose Mercury News

The *San Jose Mercury News* was founded in 1851. The newspaper maintains 13 bureau offices and has a daily circulation of 263,000 readers. Circulation extends from San Francisco to Monterey. The Mercury News's printing plant in San Jose is a 410,000-square-foot building with 1,500 employees. In 2000, the Mercury News replaced a paper insertion machine with a more advanced model, which can process inserts more quickly. They also installed a new image setter and a plate manufacturing line the following year. This equipment allowed the Mercury News to increase the number of pre-printed advertisements they could insert and allowed the expansion of the volume of their commercial printing operations.

This new equipment increased the plant's compressed air demand. Soon after the equipment's installation Mercury News staff found the new air demand levels could not always be adequately supplied with the existing set of six, 100-hp compressors. Air demand could be satisfied during normal demand periods, but during peak demand, some presses shut down even if all of the air



compressors were running. In addition, the printing plant sometimes experienced erratic performance from various compressed air end-use applications such as inserters because condensate was present in the system and pressure levels fluctuated rapidly.

## Optimizing the Design

The detailed engineering review performed by the consultant's process engineers uncovered critical shortcomings in the existing compressed air system that could be corrected at minimal expense and eliminate the need for additional compressor capacity. The evaluation found the system's control scheme was ineffective and did not have enough compressed air storage to satisfy temporary air demand spikes. This led to severe pressure fluctuations during the spikes. In addition, some compressors operated at part-load during normal air demand, which wasted energy. Also, leaks in poorly designed fittings and inefficient condensate drains created unnecessary air demand the system had to support. Process engineers prepared a detailed list of recommendations and an estimate of energy savings. The estimate of savings was affirmed by PG&E SBD engineers using Air Master+, a software tool for evaluating compressed air systems.

Recommendations that Mercury News implemented included installing:

- a multiple compressor control system
- a pressure/flow controller with 3,800 gallons of additional storage and
- mist eliminator filters

Mercury News staff also repaired leaks and lowered the system pressure. The new control system is programmed to operate two compressors at a higher pressure and send air into the storage receiver. The remaining four compressors operate depending on the system demand. The new controls allow the compressors to maintain a target pressure level of 90 pounds per square inch – gauge pressure (psig) versus the 105 psig level that the compressors previously struggled to maintain. The strategy works so well the compressed air system at Mercury News' San Jose plant satisfies production in all demand conditions with just five compressors or less.

## Project Successes and Lessons

Mercury News staff found that they could meet their production parameters without installing additional compressors. Instead, well designed controls,

NEWSPAPER PRINTING FACILITIES NEED COMPRESSED AIR FOR THE FOLLOWING PROCESSES: PAPER BLOWING, LOADING, INSERTING, PLATE MANUFACTURING, AND IMAGE SETTING. COMPRESSED AIR IS UTILIZED BY PRESSES, HIGH-SPEED CYLINDERS, AND SORTING MACHINES. COMPRESSED AIR SYSTEMS CAN CONSUME MUCH OF THE ELECTRICITY THAT THESE FACILITIES REQUIRE. WHEN A PRINTING FACILITY IS BEING EXPANDED AND/OR ITS PRODUCTION INCREASED, ITS COMPRESSED AIR SYSTEM SHOULD BE EVALUATED TO MAKE SURE IT EFFICIENTLY SUPPORTS THE TOTAL LOAD.

air storage and a pressure/flow controller were installed. Along with the measures reducing wasteful compressed air demand, the redesign greatly increased the efficiency of the existing compressed air. This qualified the San Jose Mercury News for a \$24,000 incentive from PG&E and has yielded annual compressed air energy savings of 800,000 kWh and an annual energy cost savings of \$96,000. With total project costs of \$129,000, the Mercury News achieved a 1.3-year simple payback.