

POWER SMART[®] PROFILES



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Audit Saves Motor Coach More Than \$90 000 a Year



A receiver tank (far right) and other energy efficiency measures for the compressed air system at Motor Coach Industries have improved air system quality and pressure, for substantial process improvements and yearly savings.

A full compressed air audit at Motor Coach Industries in Winnipeg showed that the company's compressed air system was annually costing \$170 000 to operate and maintain.

Improvement projects, estimated at \$250 000, are expected to lower the company's operating and maintenance costs by \$116 000 a year.

Payback for the projects is 1.5 years, with the help of a Manitoba Hydro incentive under the Performance Optimization Program.

Motor Coach, which designs and manufactures buses for North American markets, operates four screw-type air compressors at its Clarence Avenue plant in Winnipeg.

To maintain adequate system pressure, Motor Coach was forced to run all four compressors 24 hours a day, seven days a week.

Paint Problem

In the face of high operating costs, staff tried to control the compressors with timers that often turned the compressors on and off at the wrong times, causing pressure drops during critical operations, such as bus painting.

The pressure would drop below the lower limit of 65 psi required by the paint guns, marring paintwork.

Oil, water, and dust in the compressed air lines would also cause "fisheyes" and other paint defects.

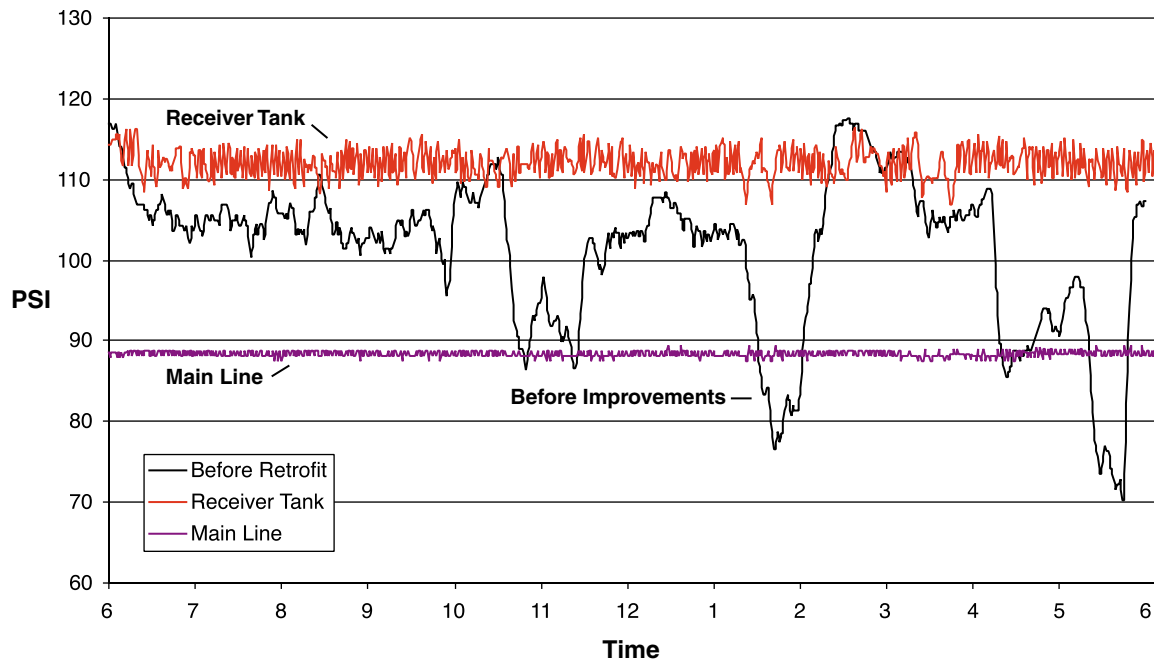
Because of detailed customer specifications, reworking a bus paint job can prove extremely costly.

"On the recommendation of Air Unlimited, which serviced our compressed air system, we asked Manitoba Hydro to perform an audit to find solutions," says Rod Cote, Manager of Facilities Maintenance for Motor Coach.

"Given the major savings that resulted, we're very glad we did."

Pinpointing Problems

Manitoba Hydro installed data loggers at critical points in the compressed air system to monitor pressure, temperature, current, and dewpoint. Readings recorded by the



Black line shows system pressure before improvements. Pressure plunged regularly from nearly 120 psi to as low as 70 psi, causing problems for painting and other compressed air end uses. Red line shows the new receiver tank absorbing pressure swings. Purple line shows plant pressure—extremely stable with the help of the storage receiver and other measures recommended by the audit.

loggers showed exactly what was happening throughout the system.

Pressure drops were caused mainly by incorrect timer settings and manual operation of the compressors.

Another factor was heat build-up in rooms housing the compressors. Temperatures would soar as high as 50°C, forcing the compressors to shut down.

In addition, leak tests with an ultrasonic leak detector identified air leakage serious enough to keep a 125 hp compressor running continuously.

Recommendations

The audit recommended the following solutions:

- upgrading ventilation in the compressor rooms to prevent overheating of the compressors
- installing heat recovery systems in the compressor rooms so that hot exhaust air could be used to warm parts of the plant during the winter months
- installing an 8200-gallon receiver tank and flow controller to cushion the compressors from large air events, and keep the minimum number of compressors on line
- running the compressors in efficient load/unload mode, rather than in less efficient modulation mode

- coordinating operation of all four compressors for maximum efficiency
- installing a 2400 cfm duplex cycling dryer to prevent moisture build-ups in the lines
- installing a high efficiency, low differential, coalescing air filter to eliminate oil and other contaminants in the lines
- installing air saver drains that automatically eliminate condensate without losing compressed air
- replacing aging hoses and other sources of air leaks, and introducing a regular system of leak testing.

Seminar Inspires Action

Following the audit, Manitoba Hydro sponsored a compressed air seminar by Scot Foss, world-class expert in compressed air system efficiency.

Inspired by ideas from the seminar, Motor Coach staff selected a proposal by Wescan, a local mechanical contractor, to perform a turnkey project that would act on the results of Hydro's audit.

Ron Marshall, the Manitoba Hydro Industrial Systems Officer who performed the audit at Motor Coach, reports that to date, the improvement

projects have reaped the following savings:

- \$50 000 in lower operating costs
- \$13 000 in reduced maintenance
- \$8 500 in lower gas heating costs through heat recovery.

Motor Coach is also saving an estimated \$20 000 a year in increased productivity from improved air quality and system pressure.

Total annual electrical savings to date are an estimated 1 650 000 kW·h and 130 kVA peak.

Future process improvements are expected to result in further savings.

“Saving power through increased efficiency was on everybody’s hit list,” says Cote.

“With this project we were able to get a double whammy—excellent power savings and much increased compressed air quality.

“And our equipment runs a lot smoother,” he says. “I can hear the difference when I’m out in the plant.”

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