Retrocommissioning: A low-cost way to improve energy performance in your HVAC system

All too often, the heating, ventilating and air conditioning systems in many commercial buildings don’t work as efficiently as designed – and this can be true even if the building is relatively new. By retrocommissioning your HVAC system you can get your system back on track and capture energy cost savings. Retrocommissioning is a systematic process for identifying and implementing operational and maintenance improvements and ensuring continued performance over time. The focus is on using low-risk O&M tuneup activities and diagnostic testing to optimize how equipment and controls operate, including how systems function together.

**Advantages of retrocommissioning**

According to ENERGYSTAR.gov, when all retrocommissioning steps are taken together, savings on heating and cooling costs can approach 15 percent.[[1]](#endnote-1) Natural gas savings can be particularly significant, as explained below. But the advantages of retrocommissioning don’t stop with energy savings.

The U.S. Department of Energy reports that by helping to improve building energy performance, retrocommissioning has been documented to increase building occupancy levels, lease rates and sale prices relative to less-efficient properties.[[2]](#endnote-2)

By bringing equipment to its proper operational state, retrocommissioning can reduce tenant complaints and increase tenant satisfaction, improve indoor air quality, reduce unscheduled downtime, decrease staff time spent on emergency calls and extend equipment life. In summary, retrocommissioning maximizes the return on investment you’ve made in your building and equipment.

**Typical retrocommissioning process**

Retrocommissioning typically includes a comprehensive review of existing documentation on equipment and controls, including operating requirements; original design documents; O&M manuals; and testing, adjusting and balancing reports. The process involves performing diagnostic monitoring and functional tests of systems. Often, systems are retested and remonitored to fine tune improvements.

Although some businesses have in-house staff with time and qualifications to perform this work, most do not, making it important to engage a qualified consultant.

The end result of retrocommissioning is that you and your facilities staff have a thorough understanding of how your HVAC systems are currently operated and maintained as well as a list of potential improvements in order of cost effectiveness.

**Payback on natural gas improvements can be as little as six months**

The potential natural gas savings from retrocommissioning can be very attractive. In its 2011 analysis of 22 retrocommissioned buildings, retrocommissioning consultant Michaels Energy found that natural gas-savings opportunities in those buildings accounted for five of the top six energy-saving recommendations. In fact, for buildings served by natural gas, the natural gas savings accounted for about 43 percent of the total savings for all fuels. [[3]](#endnote-3) The most promising natural gas-saving recommendations that Michaels identified include:

* Reduce or eliminate simultaneous heating and cooling. Believe it or not, this is a common problem, even in climates that require predominately cooling. Central air handling systems that serve a single floor or wing of a building must be able to cool some zones and heat others at the same time. But unless the system is fine tuned, it often works at cross purposes.
* Reduce ventilation levels to meet indoor air quality needs only. Michaels found ventilation often is excessive or not needed, contributing to unnecessarily high heating loads.
* Use demand-controlled ventilation to minimize ventilation levels by continuously adjusting ventilation according to occupancy.
* Implement night-setback scheduling, which often has been disabled due to a problem or complaint. By fixing the source of the problem, retrocommissioning allows a return to energy-efficient practice.
* Michaels found that the issues above were often invisible to building operators.
* Of the top recommendations identified in the Michaels Energy study, the time it took for retrocommissioning measures to pay for themselves through reduced energy-cost savings varied from six months to 2.6 years.

1. <http://www.energystar.gov/ia/business/EPA_BUM_CH5_RetroComm.pdf?a3e6-31cd> [↑](#endnote-ref-1)
2. <http://www1.eere.energy.gov/seeaction/pdfs/commercialbuildings_factsheet_retrocommissioning_stateandlocal.pdf> [↑](#endnote-ref-2)
3. Retrocommissioning and Opportunities for Natural Gas Savings, November 2011, Michaels Energy, <http://www.michaelsenergy.com/PDFs/RCx_Paper.pdf> [↑](#endnote-ref-3)