

Use of EMCS Recorded Data to Identify Potential Savings Due to Improved HVAC Operations & Maintenance(O&M)

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Energy retrofit projects are often identified through pre-screening visits and energy audits performed by consulting engineers. Audits often cost from \$0.05/ft² to \$0.12/ft². This requires spending a large sum of money, somewhere around \$175,000 to \$420,000 for a facility of 3.5 million ft². Facility operators often have difficulty obtaining funds before knowing how much energy cost can be reduced and the amount of additional investment. Consequently, energy audits are often performed on only selected buildings in a large facility. Whole campus energy projects are typically performed in multiple phases, which are largely independent. These, in turn, create the following problems: (1) retrofitted systems are often retrofitted again a short time later; (2) newly installed retrofit systems are removed or disabled; and (3) retrofit systems create operating problems in other systems.

The quality of information used is also very important for audits. Unfortunately, it is very expensive to collect actual system performance information since field tests have to be performed by auditors. Due to budget and time limits, the potential retrofit and O&M savings are often evaluated using design information, which is no longer valid. In most chiller and boiler central plants, energy management and control systems (EMCS) record key operating parameters and energy production continuously with a certain time interval, say every 2-minutes or every hour. These recorded data represent the system performance. A method has been developed to identify potential O&M savings by using the EMCS recorded data combined with field data collection. This method was applied to a central plant, which supplied heating and cooling to a University Campus with a total floor area of 3,500,000 ft². This method provided reliable savings estimates since it used the real energy performance data and also reduced the audit cost due to reduced labor for the data collection effort.