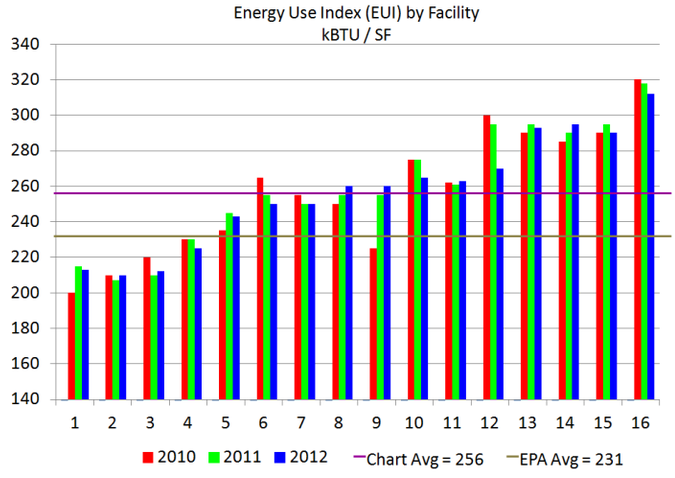
Engineering Economics, Inc.

EEInsight #2 April 2014

Ongoing Commissioning (OCx): Stop the Facility Optimization Drift

Facility owners and operators have recognized a good return on investment as a result of Commissioning (Cx) new buildings and Retro-Commissioning/Re-Commissioning (RCx) existing buildings. These efforts have consistently delivered improved system performance and energy savings as documented by Lawrence Berkeley National Laboratory (2009)[1] and other independent studies. An increased demand for Cx, RCx and related services has promoted additional interest in regular and Ongoing Commissioning (OCx) programs, including energy tracking, benchmarking and analytics of trended Building Automation System (BAS) data. Additional training and third-party software evaluation tools are being implemented to ensure that system performance does not degrade over time.

ASHRAE Guideline 0-2005 defines Ongoing Commissioning (OCx) as a continuation of the Commissioning Process well into the Occupancy and Operations Phase in order to verify that a project continues to meet current and evolving Owner's Project Requirements. Texas A&M Energy Systems Lab[2] and SBW Consulting, Inc.[3] recently completed studies of multiple facilities over a 4-year time period. The study results demonstrate a 25% decline in RCx savings benefits and revealed a 23% implementation failure of energy efficiency measures.



A successful OCx program is not simply a higher level of reporting BAS nuisance alarms. A true OCx process includes the following:

Identification and Analysis Tool
Automatically identifies irregularities and provides quantitative analysis, which reveals inefficiencies and energy savings opportunities. Smart software tools are used to estimate the loss of efficiency in real dollars based on actual energy costs.

Notification and Task Manager Tool
Web portal access is provided to facility staff so they are able to view analytical results, including prioritized action lists categorized by potential dollar savings, with support available to refine and further prioritize action items. The task manager tool helps track, manage and prioritize items indentified.

Implementation and Technical Support
Periodic site visits by Cx engineers are conducted for purposes of assessment, implementation and training in support of facility engineers in achieving real progress. Frequency and duration depend upon site specific needs, but should typically occur on a quarterly basis.

Energy performance and efficiency declines over time for a number of reasons that are often not understood, known or clearly documented. These factors include physical, operational and behavioral changes that occur over the life of a building. As a result, owners are trying to determine a better and more cost-effective way to implement an OCx process, which will add continual value.

An effective RCx process optimizes building systems performance and is certainly less expensive than new building Cx. With this in mind, however, one must acknowledge, it is a labor-intensive process that should be executed by skilled professionals. Further, the savings achieved may not justify the cost of the process. Consequently, building owners may only be willing to invest in a formal RCx process every few years.

Leading commissioning providers are looking at smart software with analytic tools needed to collect and analyze real-time data, and help identify issues and opportunities, while working with facility personnel on an ongoing basis-not just when systems fail or energy efficiency has been neglected for a considerable period of time. As a result, it is logical that OCx will become a standard process, which will soon overshadow a one-time RCx event. After all, more sophisticated owners are seeking the means to deliver sustained performance at a reasonable cost.

The major energy consuming systems (HVAC and lighting) of most modern buildings are being controlled and monitored by extensive control systems already. By utilizing readily available data from the BAS, key elements of the RCx process can be automated to provide much of the benefit at a significantly reduced cost.

With a robust third-party smart software analytic tool, automated functions can be deployed at an advisory level to monitor data for anomalies, automatically detecting, identifying and diagnosing problems by deploying smart logic algorithms. This becomes the essence of OCx.

Before proceeding with an OCx program, initial diagnostics should be run by a skilled expert to determine whether elements of the BAS system are offline, if points have failed or are out of calibration, or if there is sufficient network capacity for data mining purposes. Once these determinations are made through a focused RCx effort, an OCx program, which will provide clear value for performance improvement, can begin.

Finally, like any keys to success, the facility leadership and top management must be onboard to initiate the program, and their support must be leveraged to motivate the operations staff. The OCx provider's role, in addition to providing technical expertise and third party software tools, is to facilitate participation from all stakeholders in order to avoid potential pitfalls, establish energy goals and ensure the ultimate success of the program in achieving a reduction in utility costs.

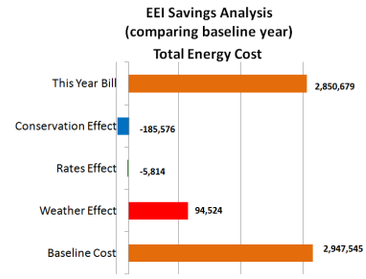
If you have any questions regarding this ongoing commissioning process or how the EEI team might support you in this effort, please contact Jarrell Wenger at 1-800-869-6902 or your local EEI representative.

References:

(1) http://cx.lbl.gov/documents/2009-assessment/lbnl-cx-cost-benefit.pdf
(2) http://nvlpubs.nist.gov/nistpubs/TechnicalNotes/NIST.TN.1727.pdf
(3) https://www.aceee.org/files/proceedings/2010/data/papers/2034.pdf

Utility Monitoring and Benchmarking

Utility monitoring and benchmarking is supported by internet-based software through the web portal, providing facility performance in BTU/SF/year, Energy Star Score and cost/SF, with adjustments made for weather and occupancy factors.

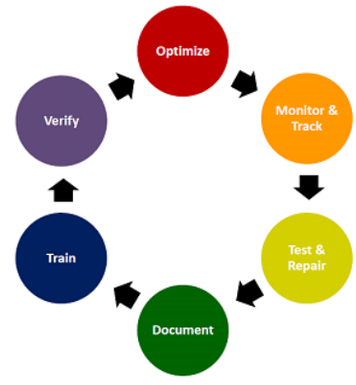


Trending and Analysis

Trending and analysis functions are an extension of the portal that automatically capture data from utility meters and sub-meters, as well as multiple BAS sub-meters for comparative analysis.

Measurement and Verification

Achievement of proper system function feeds into facility performance results that can be verified against real meter data. Energy and cost savings are tracked on a weather-adjusted basis and displayed on the web portal on a month-to-month basis.



Providing superior technical services that optimize facility performance.

http://www.eeiengineers.com

Jarrell Wenger, PE, Principal
Jarrell.Wenger@eeiengineers.com
800.869.6902