

Methods and Applications of Monitoring Based Commissioning (MBCx)

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AIA Quality Assurance



Learning Objectives

- 1. Attendees will learn what monitoring-based commissioning is and how it differs from the standard commissioning process.
- 2. Attendees will learn how monitoring-based commissioning is used to identify energy efficiency opportunities in a thorough and cost-efficient process.
- 3. Attendees will learn how monitoring-based commissioning helps energy conservation measures persevere over time without diminishing effectiveness.
- 4. Attendees will be presented with case study examples of procedures and obstacles in measuring and verifying equipment efficiencies.

Types of Building Commissioning

New Building Commissioning (Cx)

Method of risk reduction for new construction and major renovation projects to ensure that building systems meet design intent and operate optimally.

Re-Commissioning (ReCx)

Process through which buildings are commissioned again as a check to ensure that systems are functioning as originally planned and constructed.

Retro-Commissioning (EBCx)

Commissioning of an existing building that has never been or was not fully commissioned at its completion.

Monitoring Based Commissioning (MBCx)

Relies on measurements of energy use to diagnose problems, account for savings, and help ensure that savings persist over time.

Definition

- Collecting, storing, analyzing and reporting data (collected through metering equipment) to optimize energy performance and efficiency.
- This process gives end users the ability to make informed, effective energy decisions.



Phases

- Continuous Monitoring
- Evaluation
- Implementation





Phases



Continuous Monitoring Phase

 Various meters will gather building energy usage information on a 24/7 basis. This information can be accessed in real-time, allowing for a low cost and highly effective way to keep energy usage in check.



Continuous Monitoring Phase

- Requirements
 - Install permanent building energy system monitoring
 - Energy management information system
- Deliverables
 Status report

Evaluation Phase

- Perform regular evaluations of the data using comprehensive software.
- Develop highly detailed and insightful recommendations for remediation.



Evaluation Phase

- Requirements
 - Extensive knowledge in whole building interaction
 - Close coordination between managers, engineers and operators
- Deliverables
 - Analytical reports Suggestions for ECMs



Implementation Phase

- Execute the approved energy saving measures
- After measures are implemented, continual fine turning will occur to ensure optimal operation.



Implementation Phase

- Requirements
 - Close coordination between managers, engineers and operators
- Deliverables

 Priority list of ECMs
 Schedule for implementation



Continuous Commissioning

Meters will collect energy consumption information on a 24/7 basis. This information can be accessed and analyzed in real-time. Powerful software will collect the data and measure, monitor and manage energy consumption and expense across all utilities.

Engineers will be able to expertly analyze this information to provide innovative and efficient energy management solutions.

> Engineers will then visit the facility and resolve any issues, armed with effective information and resolutions.

Benefits of MBCx

Advantages

Provides

 sustained energy
 savings through
 long term tracking
 and trending of
 data to produce
 optimal operating
 strategies



Benefits of MBCx

Advantages

- Average savings in mission critical facilities and commercial office buildings of 12-20%
- Identifies

 equipment
 malfunctions and
 upgrades justify
 with real data.



Benefits of MBCx

MBCx provides three streams of additional energy savings relative to RCx.



Mills, Evan. (2009). Monitoring Based Commissioning: Benchmarking Analysis of 24 UC/CSU/IOU Projects. Lawrence Berkeley National Laboratory: Lawrence Berkeley National Laboratory. LBNL Paper LBNL-1972E. Retrieved from: http://escholarship.org/uc/item/06t5w9mg

Final Thoughts

Wrap-Up

- Investments in energy efficiency have a significant impact on bottom lines.
- Integral to maintaining and improving a building's environmental profile.
- Helps ensure that energy efficiency savings are maintained over time.



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