



U.S. Department of Energy  
Energy Efficiency and Renewable Energy

# BUILDING COMMISSIONING

Craig May  
OR-L





# COMMISSIONING

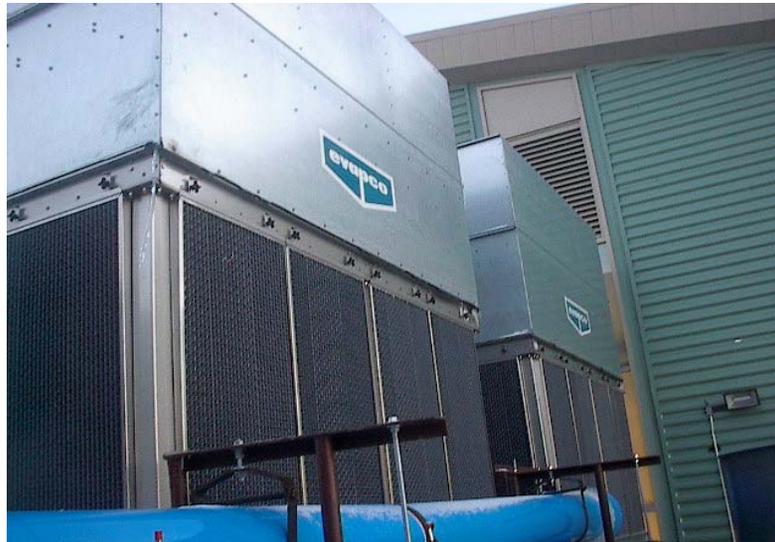
- ***Commissioning*** will insure that all structural & mechanical systems have been installed properly, functionally tested, and are in conformity with the design intent.



U.S. Department of Energy  
Energy Efficiency and Renewable Energy

# What is building commissioning?

- Building commissioning is a systematic and documented process of ensuring that the owner's operational needs are met, building systems perform efficiently, and building operators are properly trained.





U.S. Department of Energy  
Energy Efficiency and Renewable Energy

# What is the goal of building commissioning?

- To deliver a facility that operates as it was intended.
- To provide a facility that meets the needs of the building owner and occupants.
- To provide appropriate training for facility operators on the operation and maintenance of the building systems.



# When should the building commissioning process start?

- Building commissioning can be started near the end of construction. (good)
- Building commissioning can be started at the start of construction. (better)
- Building commissioning can be started during schematic design. (best)



# When should the building commissioning process start?

- Benefits of early involvement – Design review, better building commissioning specifications, clear building commissioning expectations, and better bids.
- Early involvement by the commissioning agent may not carry a cost premium. It will reduce project design problems and will introduce building commissioning expectations early.



U.S. Department of Energy  
Energy Efficiency and Renewable Energy

# Develop building commissioning scope of work

- Before meeting with the commissioning agent develop a draft commissioning scope of work.
- Ask the facility owner and operator what were the problems they have encountered on previous construction projects.
- Do not limit your commissioning to just HVAC and controls. Envelope, and other complex systems should be considered.



# Develop building commissioning scope of work

- Then use the Commissioning Guidelines for systems to be commissioned.
  - HVAC systems
  - Air distribution systems
  - Plumbing and piping systems
  - Heating and cooling plant equipment
  - Control systems
  - Electrical systems



# What should be budgeted for building commissioning?

- The following are the rules when helping a client budget for building commissioning.
- \$0.40 to \$1.50 per square foot depending on the complexity, size and location of the building.
- 1.0 to 2.0% of the total construction cost.



U.S. Department of Energy  
Energy Efficiency and Renewable Energy

# Cost savings for building commissioning

- 8% - 20% reduction in operating costs for a building that is commissioned.
- 1.5 – 3.5 year simple payback on commissioning.  
Based on:
  - fewer change orders,
  - lower energy usage, and
  - reduced operational problems.



# What does building commissioning involve?

- Verifying and documenting building systems' performance through all phases of a project from concept to occupancy.
- Testing HVAC systems' performance to ensure that they meet the needs of the building throughout the full range of operating parameters that may be encountered.



# What does the Energy Code require?

- Systems Commissioning and Commissioning Requirements. (Section 1416.4 & Section 1513.7)
- Preliminary Commissioning Report. A preliminary report of test procedures and results. (1416.4.2.2.1)
- Final Commissioning Report. A complete report of test procedures and results shall be prepared and filed with the owner. (1416.4.2.2.2)
- Functional testing of the HVAC equipment and controls. (Section 1416.4)



U.S. Department of Energy  
Energy Efficiency and Renewable Energy

# What does LEED require for building commissioning?

LEED – Leadership in Energy and Environmental Design.

- LEED requires the use of an independent building commissioning agent.
- LEED requires Fundamental Building Systems Commissioning (required for all LEED certified projects).



U.S. Department of Energy  
Energy Efficiency and Renewable Energy

# Building Commissioning Resources

- Building Commissioning Association



U.S. Department of Energy  
Energy Efficiency and Renewable Energy

# Thank You

Craig May [cmay@or-l.com](mailto:cmay@or-l.com)

