Title 24, 2013: Commissioning

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Overview

- Commissioning Requirements
- Permit triggers
- RCx Measures
Commissioning Requirements

• Section 120.8
  • Owner’s Project Requirements (OPR)
  • Basis of Design (BOD)
  • Design-Phase Review
  • Commissioning measures shown in construction documents
  • Commissioning Plan
  • Functional Performance Testing
  • Documentation and Training
  • Commissioning Report
Commissioning Requirements

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For Buildings <10,000 sq.ft.
Owner’s Project Requirements (OPR)

- Include at a minimum:
  - Energy efficiency goals
  - Ventilation requirements
  - Facility function & hours of operation
  - Equipment and systems expectations
Basis of Design

• Covered Systems:
  • Heating, ventilation, air conditioning (HVAC) systems and controls
  • Indoor lighting system and controls
  • Water heating systems and controls
  • Covered processes
Design Review

• Design Review Kickoff meeting
• Construction Documents review
Commissioning Measures

• Include in construction documents (plans and specifications)

• Includes:
  • List of systems/assemblies commissioned
  • Testing scope
  • Contractor roles & responsibilities
  • Commissioning schedule
  • O&M Manual development
  • Checklist & test form development
Commissioning Plan

- General project information
- Commissioning goals
- Roles & Responsibilities
- Systems to be commissioned
- Plans to test systems and components
Functional Performance Testing

• Demonstrate correct installation and operation of each component, system, and system-to-system interface

• FPT Reports to include
  • Components tested
  • Test methods
  • Readings & adjustments made
Documentation & Training

• Systems manual
  • Site information
  • Basic O&M instructions
  • Description of major systems
  • Equipment inventory and maintenance notes
  • Copy of inspection verifications

• Systems operations training
Commissioning Report

- Activities undertaken through design & construction
- Recommendations for post-construction phase
## Enforcement

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<th>Requirement</th>
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<tr>
<td>OPR</td>
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<td>BOD</td>
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<td>5 Compliance checklists</td>
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<tr>
<td>Cx Measures</td>
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<td>Cx Report</td>
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Permitting triggers

• New Construction
• Additions
• Alterations
Title 24 / RCx Measures

• HVAC
  • Demand control ventilation
  • Temperature setback/setup
  • Deadband spec
  • Variable airflow
  • Static pressure reset
  • Supply air temp reset
  • CHW/HW Reset
  • Variable flow pumping
  • Variable speed cooling tower fans
Title 24 / RCx Measures

• Lighting
  • Daylighting controls
  • Occupancy sensor
Title 24 / RCx Measures

- Other
  - CO sensor for underground parking ventilation
EMCS Compliance

A. Construction Inspection
Prior to functional testing and conducting other acceptance tests that rely on the EMCS:
- Factory start-up and check-out completed
- Point-to-point verification completed
- I/O point lists available
- Sequence of operations of each system are programmed
- Written sequences are available
- Input sensors are calibrated

B. Functional Testing
Conduct the following verification checks to validate the functionality of the EMCS:
1. Verify the control graphics represent the system configuration
2. Verify control points are properly mapped to the graphics screen
3. Raise and lower a sampling of space temperature setpoints in the software and verify the system responds appropriately
4. Verify the time-of-day start-up and shut-down function initiates a proper system response
5. Verify trending capabilities by establishing trend logs for a sampling of control points
6. Verify alarm conditions are monitored
7. Verify the EMCS panel is installed on an emergency power circuit or has adequate battery back-up
Title 24 / RCx Measures

- Not Covered
  - Optimum start/stop
  - Pump/chiller staging
  - OA Temp lockout
  - Chiller VFD
Metering

• Whole building meter
• Wired to allow for load disaggregation
  • HVAC
  • Lighting
  • Plug Loads
Thank You!