Upcoming Changes for Commissioning Providers

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Questions related to specific materials, methods, and services will be addressed at the conclusion of this presentation.
Presentation Description

My presentation will review LEED commissioning and the changes coming with LEED v 4.0, implications of ASHRAE Standard 189.1, and general considerations for trends in the commissioning industry.
At the end of this session, participants will be able to:

1. Identify and communicate to project teams the changes related to USGBC LEED V4 proposed rating system.
2. Identify and communicate to project teams the changes related to ASHRAE Std 189 and potential code changes.
3. Help teams understand the importance of "envelope" commissioning.
4. Prepare commissioning teams to investigate and integrate new “green building” skills.
Tom Foster:

- Has been working on facilities since 1972
- Has extensive design/build experience and problem solving focus
- Commissioning WorCx was started 10 years ago to help make buildings work better
- Is currently president of the Southeastern Regional Building Commissioning Association
- Is currently on the board of the USGBC North Carolina Chapter
- Was formerly on the ASHRAE 0.2 Existing Building Commissioning Process Development Committee
- Has commissioned 5.8 million sf of building space, 1.9 million of which is currently LEED certified.
WHO’S IN THE AUDIENCE?
How many…

are ASHRAE members?
are USGBC members?
have done LEED jobs?
have done Envelope Commissioning?
have experience with Energy Modeling?
have done Measurement & Verification?
LEED
PREREQUISITE LEED COMMISSIONING

Things we now do in Prerequisite Cx:

Owners are required to use qualified individuals to lead the Cx process, with a high level of experience in:

• Energy systems design, installation and operation
• Commissioning planning and process management
• Hands-on field experience with energy systems performance, interaction, start-up, balancing, testing, troubleshooting, operation, and maintenance procedures
• Energy systems automation control knowledge

Owners are encouraged to consider including water-using systems, building envelope systems, and other systems in the scope of the commissioning plan as appropriate. The building envelope is an important component of a facility which impacts energy consumption, occupant comfort and indoor air quality. While it is not required to be commissioned by LEED, an owner can receive significant financial savings and reduced risk of poor indoor air quality by including building envelope commissioning.
Designate an independent commissioning authority (CxA) to lead, review, and oversee the completion of all commissioning process activities.

CxA must conduct 1 commissioning design review of the OPR, BOD, and design documents prior to the mid-construction documents phase and back-check the review comments in the subsequent design submission.

CxA must review contractor submittals applicable to systems being commissioned for compliance with the OPR and BOD.

CxA or other team members must develop a system manual that provides future operating staff the information needed to understand and optimally operate the commissioned systems.

CxA or other team members must verify that the requirements for training operating personnel and building occupants have been completed.

CxA must be involved in reviewing the operation of the building with O&M staff and occupants within 10 months after substantial completion.

A plan for resolving outstanding commissioning related issues must be included.

*Currently there is no direct credit for Envelope Commissioning, although it can be achieved as an Innovation in Design credit.*
Fundamental Commissioning and Verification, a prerequisite, has been moved back to the head of the EA section with the removal of the dedicated Performance section. The most significant change in this draft is softening of a building envelope commissioning (BECx) requirement that would have made this prerequisite much more demanding (and expensive). Commissioning of the enclosure is only included at the design phase (through the Basis of Design and Owners Project Requirements documents, as well as a commissioning agent’s review of project design). In another return to the LEED 2009 scope, domestic hot water must be commissioned, but not all plumbing systems.
While several wording changes to the Minimum Energy Performance prerequisite relate to compliance for non-U.S. projects, a major change from previous drafts is that a hybrid metric of energy savings based on reductions in energy cost and in source energy use intensity reductions has been abandoned in favor of the old metric of cost savings over an ASHRAE 90.1 baseline—now 90.1-2010.
WHAT’S NEW IN LEED V 4.0
Building-Level Energy Metering

There is a new prerequisite, **Building-Level Energy Metering**. Among other things, this prerequisite inserts directly into the rating system what has in LEED 2009 been a requirement found in the Minimum Program Requirements: that projects share energy data with USGBC for at least five years.

Eliminated in the first LEED 2012 draft, the Fundamental Refrigerant Management prerequisite came back in the second and remains in the third draft. The actual credit language is fundamentally unchanged.
Option 1 in the Enhanced Commissioning credit has had its scope limited in the same way as the prerequisite, but Option 2 offers additional points for commissioning the thermal envelope. Option 3 incorporates what had been a confusing entry in the second draft: a monitoring-based commissioning credit. Now it’s simply an option offering points on top of what’s offered with Option 1, by requiring the development of monitoring-based procedures to be incorporated into the commissioning scope. Among other things, the plan would require a list of points to be trended with associated frequency and duration for trending, and limits of acceptable values for tracked points. Maximum points in this credit are achieved through Option 4—“all of the above.”
WHAT’S NEW IN LEED V 4.0
Optimize Energy Performance

The Optimize Energy Performance credit reflects similar changes as the prerequisite: the new hybrid metric is gone from this draft, as is the prescriptive compliance path using the Advanced Buildings Core Performance Guide.
Advanced Energy Metering is a vastly simplified credit from previous drafts. It requires whole-building energy sources and energy end-uses comprising more than 10% of total consumption to have “advanced energy meters,” defined as permanently installed meters recording data in 1-hour-or-less intervals and able to transmit data. The gist of these requirements has not changed from previous drafts, but complicated prescriptive and performance paths have been dropped.
WHAT’S NEW IN LEED V 4.0
Demand Response

After overhauling a new Demand Response credit in the second draft, USGBC mostly left it alone here, although it has been simplified, with the removal of an option incentivizing semi- or fully-automated demand-response systems.
WHAT’S NEW IN LEED V 4.0
Site Renewable Energy

There are minimal new changes to the On-Site Renewable Energy credit, with the biggest change from LEED 2009 still being the allowance of “solar gardens” or community renewable energy systems as long as they are in the same utility service area.
Refrigerant Management credit appears at first glance to be rewritten, but the changes are apparently simply the addition of metric versions of compliance equations.
A new credit called Reconcile Design and Actual Energy Performance, which built on the LEED 2009 M&V credit, has been dropped from this draft, with its overall intent and some of its methods apparently folded into the other energy-efficiency and energy metering credits.
As in previous drafts, **Green Power and Carbon Offsets** now applies to total energy use, not just electricity use. Projects may use RECs, carbon offsets, or other sources of "green power" to offset project energy use by quantity consumed, not cost.
ASHRAE
The purpose of this standard is to provide minimum requirements for the siting, design, construction, and plan for operation of high-performance green buildings to:

a. Balance environmental responsibility, resource efficiency, occupant comfort and well being, and community sensitivity, and

b. Support the goal of development that meets the need of the present without compromising the ability of future generations to meet their own needs.
COMMISSIONING IN ASHRAE 189.1
Section 10 – Construction and Plans for Operation

Construction

Building Project Commissioning
For buildings that exceed 5000 ft² of gross floor area, commissioning shall be performed in accordance with this section using generally accepted engineering standards and handbooks acceptable to the AHJ. Buildings undergoing the commissioning process will be deemed to comply with the requirements of Section 10.3.1.1, “Building Acceptance Testing.”

Activities Prior to Building Permit
Activities Prior to Building Occupancy
Post-Occupancy Activities
Documentation
This standard provides minimum criteria that:

a. Apply to the following element of building projects:
   1. New buildings and their systems
   2. New portions of buildings and their systems
   3. New systems and equipment in existing buildings

b. Address site sustainability, water use efficiency, energy efficiency, indoor environmental quality (IEQ), and the building's impact on the atmosphere, materials, and resources.

The provisions of the standard do not apply to:

a. Single-family houses, multi-family structures of three stories or fewer above grade, manufactured houses (mobile homes) and manufactured houses (modular), and

b. Buildings that use none of the following: electricity, fossil fuel, or water.

This standard shall not be used to circumvent any safety, health, or environmental requirements.
COMMISSIONING IN ASHRAE 189.1
Section 10 – Construction and Plans for Operation

**Scope**
This section specifies requirements for construction and plans for operation, including the commissioning process, building acceptance testing, measurement and verification, energy use reporting, durability, transportation management, erosion and sediment control, construction, and indoor air quality during construction.

**Compliance**
All of the provisions of Section 10 are mandatory provisions.
COMMISSIONING IN ASHRAE 189.1
Section 10 – Construction and Plans for Operation

Mandatory Provisions

Construction

Building Acceptance Testing
Acceptance testing shall be performed on all buildings in accordance with this section using generally accepted engineering standards and handbooks acceptable to the AHJ.

An acceptance testing process shall be incorporated into the design and construction of the building project that verifies systems specified in this section perform in accordance with construction documents.

Activities Prior to Building Permit
Activities Prior to Building Occupancy
Systems
Documentation
The following systems, if included in the building project, shall be commissioned:

a. Heating, ventilating, air-conditioning, IAQ, and refrigeration system (mechanical and/or passive) and associated controls. Control sequences to be verified for compliance with construction documentation as part of verification.

b. Building envelope systems, components, and assemblies to verify the thermal and moisture integrity.

c. Building envelope pressurization to confirm air-tightness if included in BOD requirements.

d. All lighting controls and shading controls.
COMMISSIONING IN ASHRAE 189.1
Section 10 – Construction and Plans for Operation

Construction Systems

e. Irrigation
f. Plumbing
g. Domestic and process water pumping and mixing systems.
h. Service water heating systems.
i. Renewable energy systems
j. Water measurement devices, as required in Section 6.3.3.
k. Energy measurement devices, as required in Section 7.3.3.
MEASUREMENT & VERIFICATION IN ASHRAE 189.1
Section 10 – Construction and Plans for Operation

Construction

Water Use Efficiency

Initial Measurement & Verification
Track and Assess Water Use
a. Usage Reports
b. Benchmark Water Performance
c. Assess Water Use Performance

Documentation of Water Use
MEASUREMENT & VERIFICATION IN ASHRAE 189.1
Section 10 – Construction and Plans for Operation

Construction

Energy Efficiency

Initial Measurement & Verification
Track and Assess Energy Consumption
a. Energy Usage Reports
b. Track Energy Performance
c. Assess Energy Performance

Documentation of Energy Efficiency
Multiple certifications are available and accreditation:

- BCA
- NEBB
- ACG
- ASHRAE
- Association of Energy Engineers (AEE)
The new International Green Code which has been adopted in many states and jurisdictions requires commissioning all buildings over 5,000 sf. But the big question is “By Whom?” There are current discussions going on about the AHJ (Authority Having Jurisdiction) determining who will do commissioning. The IAS is looking at how to decide this.
COST OF ENVELOPE COMMISSIONING

The cost of envelope commissioning will be a deterrent to full envelope commissioning, however it may be applicable in some cases on a sampling basis.

Who can do it?
Structural engineers who have knowledge of roofing, wall systems, and flashings.
Architects who are very experienced in laying out details of wall flashings and roofing.
Roofing and envelope specialists for traditional MEP commissioning companies with advanced training.
Movement towards reducing sustainable requirements to cut costs. There are currently bills in both the House and Senate that would severely restrict the government from utilizing LEED on projects. They are suggesting that they want an ANSI certified rating system which pretty much leaves Green Globes. They also refer to ASHRAE Standard 189.1 which is not a rating system, but rather a standard for codifying sustainable requirements. The issue with this is that Green Globes has very limited acceptance (less than 250 buildings certified vs. over 10,000 for LEED).
CONCLUSIONS

- Commissioning is evolving
- Commissioning has credibility
- We need to be aware that there are outside influences on the commissioning industry that may not be in the best long term interests of owners or commissioning providers.
QUESTIONS?
THANK YOU

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