Total or Whole Building Commissioning

Earle Kennett
National Institute of Building Sciences
Total Building Commissioning

...an industry wide process for the development of a full range of building system commissioning guidelines
Total Building Commissioning

...to ensure that the performance of the facility and its systems meet the functional and operational needs of the owner and occupants.
Objectives of Total Building Commissioning

“New” comprehensive documentation of

- owner’s project requirements
- basis of design decisions and strategies
- tests to verify system performance
- training for building operation and maintenance
History of Total Building Commissioning

- 1982 - ASHRAE forms Commissioning Committee
- 1989 - Guideline 1: HVAC Commissioning
- 1996 - Update of Guideline 1
- 1999 - ASHRAE and NIBS embark on TBC program
- 2003-5 - Development of Guideline 0: The Commissioning Process
- 2005-7 - Revision of Guideline 1
- 2005-6 - Development of Guideline 3
TBC Guideline Objective

Provide for a uniform, integrated, comprehensive approach for the commissioning of all major building systems.
TBC Commissioning Guidelines

0. General Procedures

1. HVAC & R Systems

2. Structural Systems

3. Enclosure Systems

4. Interior Systems
5. Plumbing Systems  ASPE
6. Lighting Systems  IES
7. Electrical Systems  NECA
8. Fire Protection Systems  NFPA
9. Telecommunications Systems
TOTAL BUILDING COMMISSIONING PROCESS

ASHRAE Guideline 0-2005: The Commissioning Process
(Used as the foundation of ASHRAE Guideline 1, NIBS Guideline 3, and other Total Building Commissioning Process technical guidelines)

ASHRAE Guideline 1-2006
HVAC&R Technical Requirements for The Commissioning Process

NIBS Guideline 3-2006
Exterior Enclosure Technical Requirements for The Commissioning Process

Guidelines 2-200X & 4-200X through 14-200X
Technical commissioning guidelines dealing with structure, electrical, lighting, interiors, plumbing, etc.
Exterior Enclosure
Technical Requirements
For the Commissioning Process

This Guideline is for Use with
ASHRAE Guideline 0-2005:
The Commissioning Process
**THE WHOLE BUILDING DESIGN APPROACH**

The goal of 'Whole Building' Design is to create a successful high-performance building. To achieve that goal, we must apply the integrated design approach and the integrated team approach to the project during the planning and programming phases. Read more

**2007 Energy**

August 1-8, 2007 • New Orleans, Louisiana

Join us August 5-8, 2007 in New Orleans, LA, and help celebrate the 10th anniversary of the Federal Government’s premier annual energy workshop and exposition. Read more

**National BIM Standard™ Version 1.0—Part 1: Out for Industry Review**

The first version of the National Building Information Modeling Standard™ (NBIMS) was released for a two month industry review period today. The document titled "National Building Information Modeling Standard Version 1.0—Part 1: Overview, Principles, and Methodologies" provides the capital facilities industry with its first comprehensive look at the full scope of requirements for Building Information Modeling (BIM). Read more

**FEMA Releases New Natural Hazards**

**WBDG Focus**

*Journal of Building Enclosure Design* (BED)

The Building Enclosure Technology and Environment Council (BETEC) of The National Institute of Building Sciences (NIBS) is pleased to announce the continuation of our relationship with Matrix Group Publishing in the production of the *Journal of Building Enclosure Design*—the premier publication for research and development on building enclosure systems for North America. Read more

**Previous Focus—United States National CAD Standard™**

**Popular Links**

Below are a selection of WBDG pages, documents or tools that are frequently requested by users:

- Building Envelope Design Guide
- Construction Criteria Base (CCB)
- Construction Waste Management Database
- Executive Order 13423 Technical Guidance
- Federal Green Construction Guida for Specifiers
- Unified Facilities Criteria
- Unified Facilities Guide Specifications (UFGS)

**New and Updated Pages**

- Case Study—EPA Region 8 Headquarters NEW
Building Commissioning

by the WBDG Project Management Committee

Project Management > Building Commissioning > - Determine Project Performance Requirements
- Document Compliance and Acceptance
- Plan the Commissioning Process

INTRODUCTION

Building Commissioning is a rapidly emerging A-E-C project management practice that is being embraced by public and private organizations because of its benefits in improved project delivery results.

This section of WBDG organizes commissioning information, guidance, and resources under three broad principles, including Determine Project Performance Requirements, Plan the Commissioning Process, and Document Compliance and Acceptance. It is important to note that all three principles are applied over the life-span of a capital design and construction project, and that it takes a multi-disciplined effort involving owners, design professionals, constructors, and commissioning providers to achieve optimal results from the commissioning process.

This WBDG page provides an overview of commissioning drivers, benefits, goals, and principles and general commissioning guides, standards, and resources.

Definition

ASHRAE Guideline 0, The Commissioning Process, defines commissioning as "a quality-oriented process for achieving, verifying, and documenting that the performance of facilities, systems, and assemblies meets defined objectives and criteria". Commissioning is therefore an "umbrella" process for all the planning, delivery, verification, and managing risks to critical functions performed in, or by, facilities. Commissioning uncovers deficiencies in design or installation using peer review and field verification. Commissioning also accomplishes higher energy efficiency, environmental health, and occupant safety and improves indoor air quality. Commissioning is a quality assurance-based process that delivers preventive and predictive maintenance plans, tailored operating manuals, and training procedures. Essentially, the commissioning process formalizes review and integration of all project expectations during planning, design, construction, and occupancy phases by inspection and functional performance testing, and oversight of operator training and record documentation.

Commissioning Definitions  (PDF 26 KB, 3 pgs)

Benefits

Commissioning assists in the delivery of a project that provides a safe and healthful facility; improves energy performance; optimize energy use; reduces operating costs; ensures adequate O&M staff orientation and training; and improves installed building systems documentation.
Conclusion

The commissioning process can be applied in a variety of approaches focusing on building systems/assemblies and can be customized to suit project needs. But regardless of commissioning approach and system focus, it always requires a clear definition of performance expectations, rigor in planning and execution, and thorough project testing, operational training, and documentation.

RELEVANT CODES AND STANDARDS


ADDITIONAL RESOURCES

Organizations and Associations

ASHRAE—A leading organization in the development of standardized commissioning guidelines
Building Commissioning Association—A leading professional association for membership and certification of building commissioning practitioners.