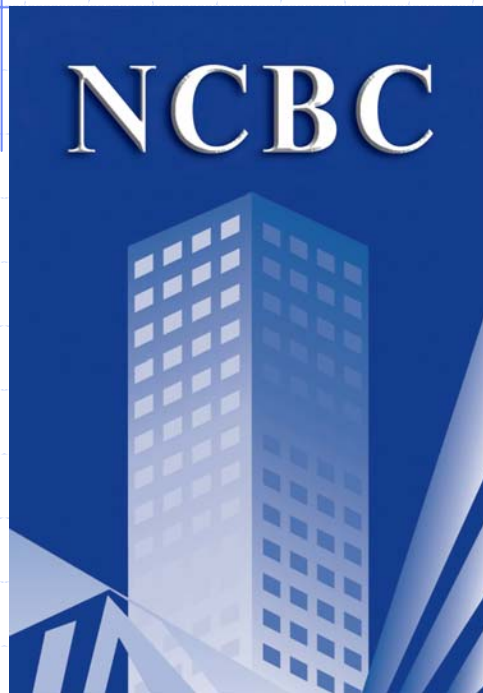


Total or Whole Building Commissioning



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**

**NIBS &
ASHRAE**

◆ **1. HVAC & R Systems**

ASHRAE

◆ **2. Structural Systems**

ASCE

◆ **3. Enclosure Systems**

NIBS

◆ *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.

NIBS Guideline 3-2006

Exterior Enclosure Technical Requirements For the Commissioning Process

*This Guideline is for Use with
ASHRAE Guideline 0-2005:
The Commissioning Process*



National Institute of
BUILDING SCIENCES

The Whole Building Design Guide



The Gateway to Up-To-Date Information on Integrated 'Whole Building' Design Techniques and Technologies

Participating Agencies:



Design Guidance

Building Types
Space Types
Design Disciplines
Design Objectives
Products & Systems

Project Management

Delivery Teams
Planning & Development
Building Commissioning
Delivery & Controls

Operations & Maintenance

Mandates / References

Federal Mandates
Publications
Case Studies
Participating Agencies
Industry Organizations
Related Links

Tools

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GreenerBuildings



**SUSTAINABLE BUILDINGS
INDUSTRY COUNCIL**



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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](#)



August 5-8, 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



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 Guide for Specifiers](#)
- [Unified Facilities Criteria](#)
- [Unified Facilities Guide Specifications \(UFGS\)](#)

New and Updated Pages

- [Case Study—EPA Region 8 Headquarters](#) **NEW**

Design Guidance

Building Types
Space Types
Design Disciplines
Design Objectives
Products & Systems

Project Management

Delivery Teams
Planning & Development
Building Commissioning
Delivery & Controls

Operations & Maintenance

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Tools

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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

[Related Resource Pages](#) [Print](#) [Email](#)

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.

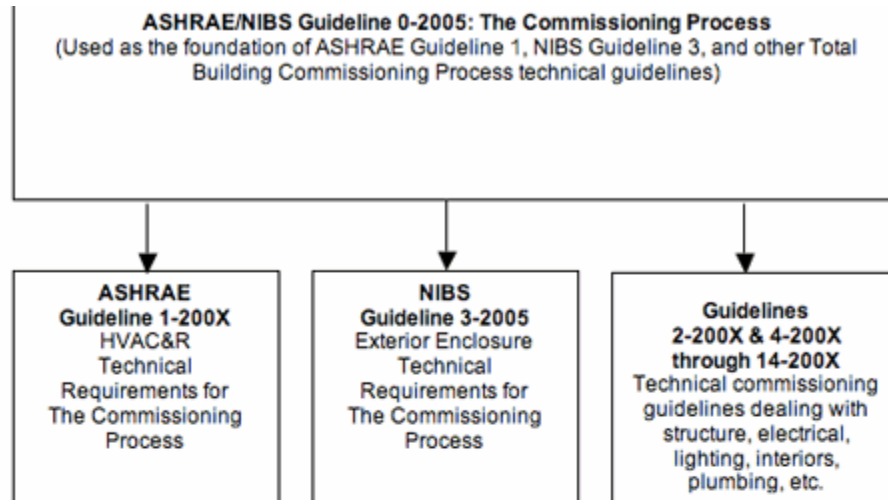
Definition

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.



NIBS Guideline 3 (Draft Version)—Total Building Commissioning (TBC) Process
 NIBS Guideline 3 (Draft Version)—Total Building Commissioning (TBC) Process

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 clear definition of performance expectations, rigor in planning and execution, and thorough project testing, operational training, and documentation.

RELEVANT CODES AND STANDARDS

[*ASHRAE Guideline 0-2005: The Commissioning Process*](#)—the industry-accepted Commissioning Guideline.

[*NIBS Guideline 3-2006: Exterior Enclosure Technical Requirements for the Commissioning Process*](#), National Institute of Building Sciences, 2006.

[*The Building Commissioning Guide*](#), U.S. General Services Administration, 2005.

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