

# Welcome

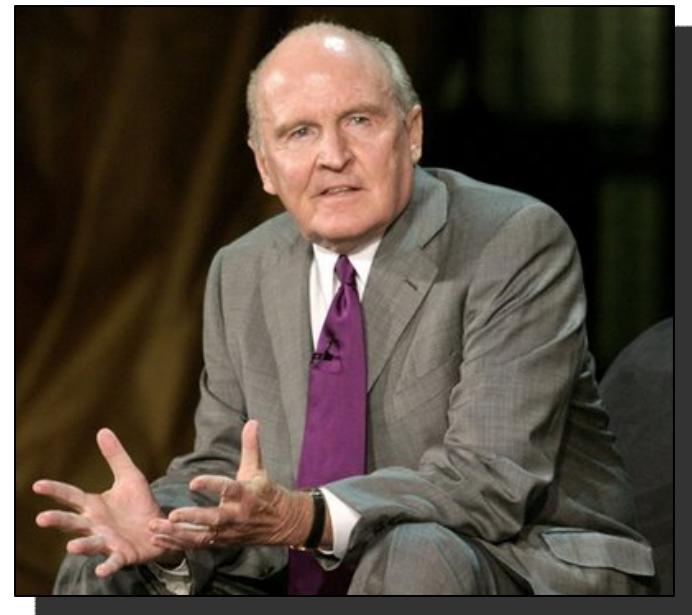
## The Language of Commissioning

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# Change

“If the rate of change inside an organization is less than the rate of change outside the organization, the end is in sight.”

Jack Welch  
Former CEO of GE



# Learning Objectives

Answer the following questions about Commissioning:

- What is it?
- How does it work?
- Why go to the expense?
- When is it done?
- Who is involved?
- What's the advantage to a code official?



Commissioning

# WHAT IS IT?



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# Myths About Commissioning

- “It’s just a bigger and better punch list.”
- “It’s at the end of construction to test systems.”
- “Commissioning is just a fancy word for TAB, and it costs a lot more in the end.”

# Commissioning is a process



**not an event.**

# Commissioning

Commissioning can be done to anything in a building from HVAC to windows and doors.

**BUT...**

You can't commission just a system – you have to commission the entire building as a whole system.

# Purposes of Commissioning

Commissioning is a process for:

- achieving
- verifying
- documenting

the performance of a building (and its systems) meets:

- the design intent, and
- the owner's operational needs

# Purposes of Commissioning

Commissioning tests the operation of the equipment and buildings systems to ensure:

1. operate as designed
2. can satisfactorily meet the needs of the building throughout the entire range of operating conditions

# Commissioning Types

- New Construction
- Retro-Commissioning
- Re-Commissioning
- Ongoing Commissioning



Commissioning

# HOW DOES IT WORK?

# ASHRAE Guidelines

- Guideline 0 – The Commissioning Process
- Guideline 1.1 – HVAC System Commissioning



# New Construction Commissioning

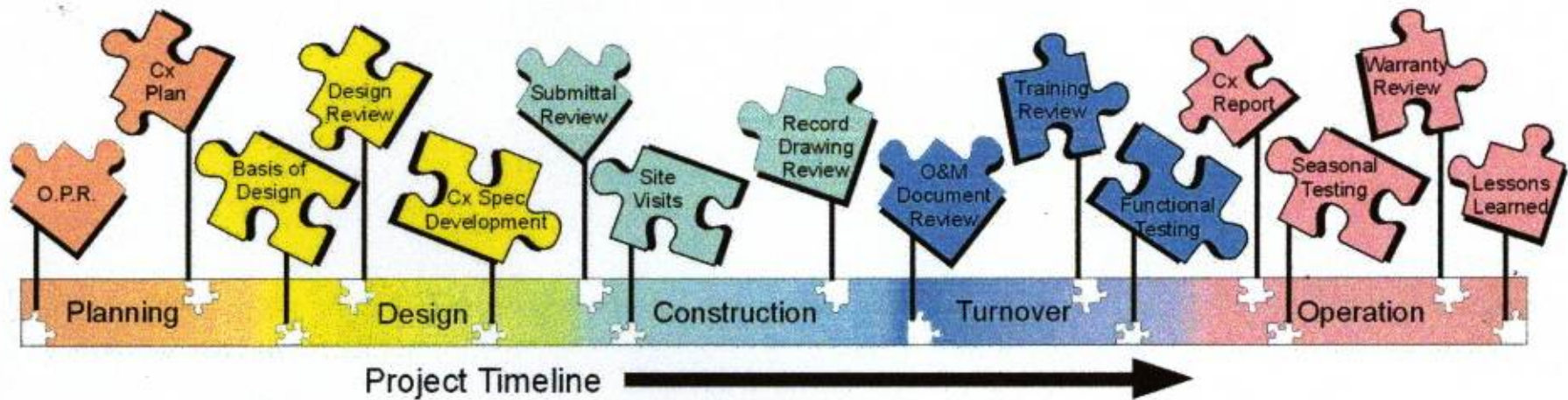
# What is the Commissioning Process?

- The end goal is defined in writing.
- Work is done right the first time.
- Every person is responsible for quality
- Work is verified, not just inspected.
- Focus is the life of the facility, not the first day of occupancy.

# NC Commissioning Process

1. Planning
2. Design
3. Construction
4. Turnover
5. Operation

# The Commissioning Process



# Having a Goal

"If you don't know where you are going, you will windup somewhere else." – Yogi Berra



# OPR

- *Owner's Project Requirements*
- Also known as “The Design/Project Intent”
- The first thing you do when you start commissioning regardless of where in the building process you are.
- Verify OPR – the whole point of commissioning

# OPR

- Allows the Owner to define what they mean in their own terms.
- Keeps owner on track.
  - Changing minds is frustrating and expensive
  - Keeps owner's staff “on-point”

# Commissioning Plan

A document, prepared by CxP, outlining the

- organization
- schedule
- allocation of resources
- documentation requirements

of the commissioning process.

# Commissioning Plan

# BOD

*Basis of Design* - The designer's answer to the challenges of the OPR.

# Solving Problems

“You don’t solve your problems by drywalling over them.

They are bound to reveal themselves in time.”



# Object of Sampling

- Not 100%.
- Sufficient number to catch problems.
- 3 of 10 bad? Test another 10.
- 0 bad? Probably ok.
- 3 more bad? Test another 10 or more.



# Retro-Commissioning

# Retro-Commissioning

## *Common opinion*

The difference between retro-commissioning and an energy audit:

- Energy audit is observation
- Retro-commissioning is observation and action

# Does It Make Sense?

- Age and condition of building and equipment
- Known comfort problems
- Utility costs
- Lease agreements
- Potential return on investment
- Availability of incentive programs

# Retro-Commissioning Process

1. Planning
2. Investigation
3. Implementation
4. Verification and Continuation



# Ongoing Commissioning

# Characteristics

- Not a “snapshot” as other commissioning processes tend to be.
- Dynamic and continuous
- Uses performance tracking strategies
- Usually uses Facility Management staff, contractors, occupants, and others.



# Re-Commissioning



# Is It Time?



Is there an unjustified increase in energy use?

# Is It Time?



Is energy use more than 10% higher than previous years?

# Is It Time?



Have comfort complaints increased compared to previous months or years?

# Is It Time?



Has nighttime energy use increased?

# Is It Time?



Is the building staff aware of problems, but lacks the time or in-house expertise to fix them?

# Is It Time?



Has control programming been modified or overridden to provide a quick fix to a problem?

# Is It Time?



Are there frequent equipment or component failures?

# Is It Time?



Have there been significant tenant improvement projects?

# Is It Time?



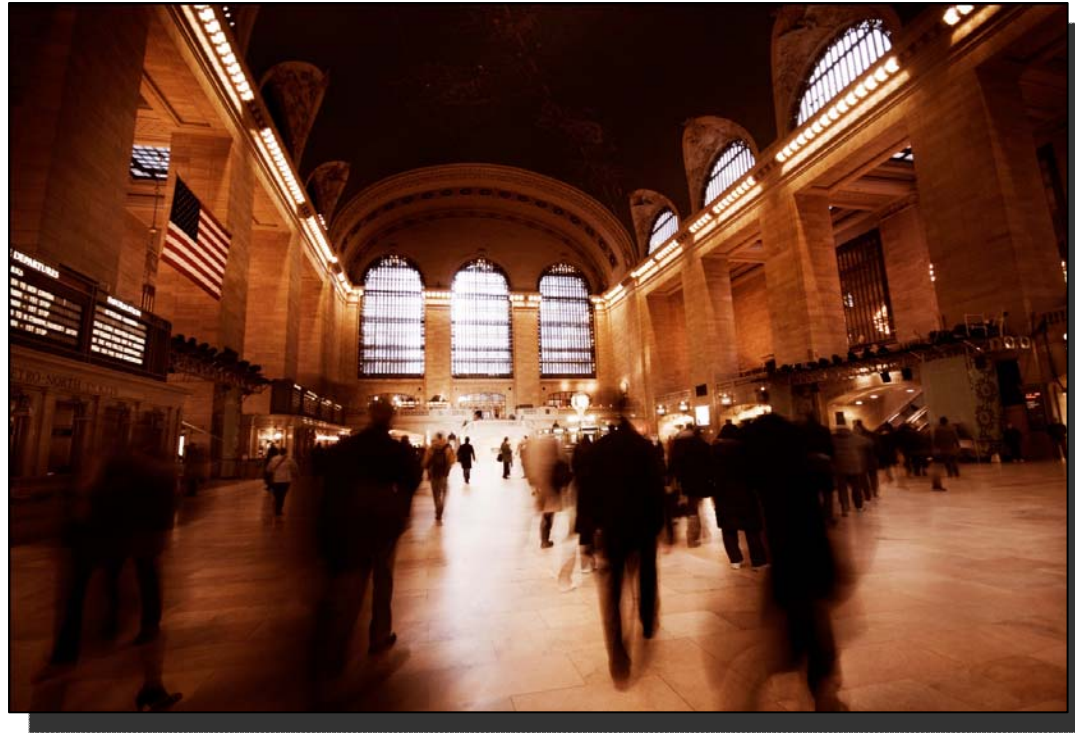
Even if you don't answer yes to two or more questions, re-commission every 3-5 years.



Commissioning

# WHY GO TO THE EXPENSE?

# Performance Gap



The difference between expected and actual performance of a building.



Reduce expenses and increase revenue through improved building operations.

# Essential Concepts of the Commissioning Process

- Takes the uncertainty out of the delivery of constructed projects
- Does as well as any other approach, but at a lower cost
- Has means to use statistical tools
- Has an element of continuous improvement
- Transfers knowledge from planning to operations



Commissioning

# WHEN IS IT DONE?

# Cost of Change

If you start the commissioning process later in the project life, change becomes more expensive.

Catches the “big stuff” but not EVERY problem.



Commissioning

# WHO IS INVOLVED?

# Who are the Key Players?

- Owner
- Commissioning Agent
- Building Certification Professional
  - Green Globes Professional
  - LEED-AP
- General Contractor/Project Manager
- Design Professional (Architect/Engineer)

# Common Challenge

Change common practices to better practices.

# Change

People don't resist change as much as they resist BEING changed.



Being in the driver's seat vs. being in the trunk.

# Commissioning Professional

- Known as Commissioning Agent (Authority)
- Provides integral process vs. a stack of disjointed, independent experts.
- Works for owner
- The Commissioning Authority (Agent) has no authority at all.

# Commissioning Professional Skills

Retrocommissioning - CxP should be an engineer or someone highly technical.

New construction – CxP should be a very diplomatic coordinator skilled in the commissioning process.

# Role of Cx Authority

- Verify – NOT inspect
- Recommend – NOT repair

# Commissioning Professional Certifications

Organization	Certification
Association of Energy Engineers (AEE)	Certified Building Commissioning Professional (CBCP)
American Society of Heating Refrigeration and Air Conditioning Engineers (ASHRAE)	Commissioning Process Management Professional (CPMP)
Building Commissioning Association (BCA)	Certified Commissioning Professionals (CCP)
University of Wisconsin	<ul style="list-style-type: none"> <li>• Commissioning Process Authority Professional (CxAP)</li> <li>• Commissioning Process Manager (CxM)</li> <li>• Commissioning Process Technical Service Provider (CxTS)</li> </ul>



Commissioning

# WHAT'S THE ADVANTAGE TO A CODE OFFICIAL?

**LEARN, IMPLEMENT, ENCOURAGE**



# QUESTIONS?