By Definition

“Commissioning is the process of verifying and documenting that the facility and all of its systems and assemblies are planned, designed, installed, tested, operated, and maintained to meet the Owner’s Project Requirements.”

USBC LEED New Construction and Major Renovations
What is Commissioning?

By Definition

“A quality focused process for enhancing the delivery of a project. The process focuses upon verifying and documenting that the facility and all of its systems and assemblies are planned, designed, installed, tested, operated, and maintained to meet the Owner’s Project Requirements.”

ASHRAE Guideline 0
What is Commissioning?

By (Encotech) Definition

“Commissioning is a quality driven systematic process that will verify the systems and equipment being commissioned are installed and perform independently and interactively as per the construction documents in order to meet the owner’s expectations and operational needs.”
A Layman’s Definition

“Commissioning is making sure the owner gets what they are paying for.”

Lynn Brown, P.E., QCxP
1. The Owners get what they are paying for
Benefits of Commissioning

Owners will ask the question:

“Why do I have to pay all this money to hire a commissioning team? Isn’t it the responsibility of the construction manager, engineer, architect, and all the different subcontracting firms to give me what I paid for?”
Benefits of Commissioning

In a perfect (unreal) world, it is true, you would not need to hire a commissioning team...BUT
Benefits of Commissioning

In the real world, there are such things as:

• Tight Design Schedules / Deadlines
• Changing of Tight Design Schedules / Deadlines
• Tight Construction Schedules / Deadlines
• Changing of Tight Construction Schedules / Deadlines
• Manpower availability during design
• Manpower availability during construction
• Quality of engineering service
• Quality of GC and subcontracting firms
Real World Results

Real world challenges...Design Phase

The potential for:

• Lower quality of drawings produced
• Constructability issues
• Operational issues
• Code issues

In other words there are “holes” in the construction documents.
Real World Results

Real world challenges...Construction Phase

The potential for:

• Equipment and systems not installed as per drawings
• Equipment and system not operating as designed or interactively.
• Increase construction costs
• Potential of missing the projected substantial completion date
• Waste of time with RFI’s/Addendums
How Can Commissioning Help?

During the Design Phase

• Review OPR and BoD Documents
• Review the construction documents, drawings and specifications, prior to issuing for construction for:
  • Constructability
  • Commissionability
  • Major Code Violations
  • OPR Requirements are met

The review of the drawing is NOT a peer review or engineering review.
How Can Commissioning Help?

During the Construction Phase

- Execute PFC Documents
- Execute FPT Documents
- Execute IST Documents
Benefits of Commissioning

1. The Owners get what they are paying for
2. Helps reduce RFI’s / Addenda, resulting in preventing construction cost creep
Benefits of Commissioning

1. The Owners get what they are paying for
2. Helps reduce RFI’s/ Addenda, resulting in preventing construction cost creep
3. Energy Savings
Energy Benefits of Commissioning

It has been proven that a commissioned building will have a very high probability of saving energy over buildings that are not commissioned.

“The commissioning projects for which data are available revealed over 10,000 energy-related problems, resulting in 16% median whole-building energy savings in existing buildings and 13% in new construction.”

Excerpt from a study by the Lawrence Berkeley National Laboratory for the California Energy Commission Public Interest Energy Research.
Energy Benefits of Commissioning

In another study by Evans Mills of the Lawrence Berkeley National Laboratory

186 buildings studied consisting of:

- Government buildings
- Office buildings
- Hotels
- Healthcare buildings
- Educational buildings
- Retail buildings

The energy savings was in the range of 10 – 15%.
Post Construction Benefits

- Minimal complaints related to the commissioned equipment and systems.
- Minimal “call-back” to the contractor to resolve problems.
- Smooth transition of building operation to building engineers.
- Commissioning confirms building operators have been trained in the operation and maintenance of the commissioned equipment and systems.
Benefits of Commissioning

1. The Owners get what they are paying for
2. Helps reduce RFI’s / Addenda, resulting in preventing construction cost creep
3. Energy Savings
4. Less Complaints after occupancy
5. Building operators equipped to operate and maintain commissioned equipment
Is Commissioning Worth the Cost?

Another question an owner will ask when addressed on the topic of commissioning their project is:

“Is it worth the cost I am paying to the commissioning firm for the building to be commissioned?”

In other words, is commissioning a viable investment?

Commissioning Benefits > Commissioning Costs
Is Commissioning Worth the Cost?

According to a Lawrence Berkeley National Laboratory study the following are the facts and figures of costs related to commissioning:

- **Commissioning cost ranged from:**
  - “$0.30/ft\(^2\) for existing buildings and $1.16/ft\(^2\) for new construction
  - (or 0.4% of the overall construction cost).”

- **The savings to the owner in terms of energy savings were:**
  - “16% median whole-building energy savings in existing buildings and 13% in new construction”

- **Resulting in a payback time of:**
  - “1.1 years and 4.2 years”
Personal Payback from Commissioning

Based on a data base of many projects I have commissioned it was not uncommon to have:

- **Immediate payback**
  - The cost savings was greater than the commissioning cost.

- **Priceless Pay Back**
  - How can a price be put on the potential saving of a life
    - Emergency generator did not work
    - Smoke Evacuation system did not work
    - Nitrous Oxide system failure
  - How can a price be placed on failure of a critical system
    - Failure of the air conditioning system at a data center
    - Even worse, backup system does not work
Benefits of Commissioning

1. The Owners get what they are paying for
2. Helps reduce RFI’s/ Addenda, resulting in preventing construction cost creep
3. Energy Savings
4. Less Complaints after occupancy
5. Building operators equipped to operate and maintain commissioned equipment
6. **It is worth the money**
Commissioning Oversight

- What is Commissioning Oversight?
- Why is Commissioning Oversight needed?
- Benefits of Commissioning Oversight...
Benefits of Commissioning

1. The Owners get what they are paying for
2. Helps reduce RFI’s / Addenda, resulting in preventing construction cost creep
3. Energy Savings
4. Less Complaints after occupancy
5. Building operators equipped to operate and maintain commissioned equipment
6. It is worth the money
7. Meet Substantial Completion Date
Questions?

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