



MAINTENANCE AND COMMISSIONING - CEM

REFRESHER TRAINING COURSE

KRISHNAJI PAWAR, LEED AP BD+C, GSAS CGP, ISO 14001:2015, GCP

CEM REFRESHER TRAINING COURSE





PRE-DESIGN PHASE COMMISSIONING

FOR ENERGY PROFESSIONALS

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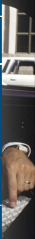


LEARNING OBJECTIVES





Commissioning Process
Pre-Design Phase
Commissioning Objectives
Pre-Design Phase
Commissioning Activities
Develop the Pre-Design Phase
Commissioning Plan
Owner's Project Requirements
Document
Owner's Project Requirements
Documentation





COMMISSIONING PROCESS

Commissioning is the process of planning, documenting, scheduling, testing, adjusting, verifying, and training, to provide a facility that operates as a fully functional system per the Owner's Project Requirements.

The goal of the Commissioning Process is to enhance the quality of the delivered project by focusing the design and construction team on the Owner's goals for a functional and energy efficient building.

A quality-focused process for enhancing the delivery of a project and includes verifying and documenting that the facility and its systems and assemblies are planned, designed, installed, tested, operated and maintained to meet the Owner's Project Requirements.

PRE-DESIGN PHASE COMMISSIONING

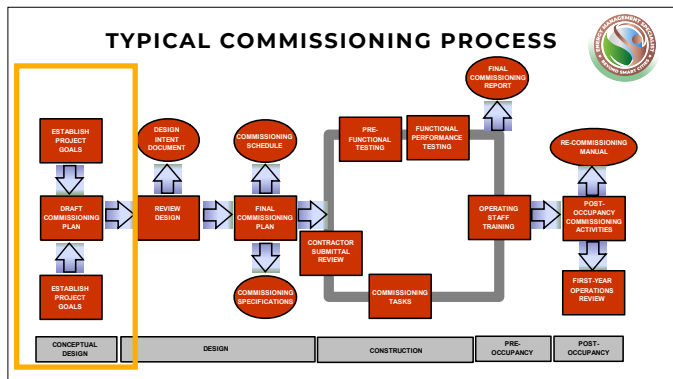
Commissioning ideally begins in the pre-design phase. The Pre-Design Phase lays the groundwork for the project, defines the plan for commissioning, and begins the essential team building process.

During this phase the design and commissioning teams are assembled and the Owner's Project Requirements (OPR) and the building program are developed. All decisions made in ensuing phases should be made with reference to the OPR.

It is important to start the commissioning process in the pre-design phase.

This early involvement by the CxP is critical for the timely and useful development of the Owner's Project Requirements (OPR), the subsequent design team Basis of Design (BOD), the Commissioning Plan, and the beginning of the Operations & Maintenance (O&M) Systems Manual.

If these tasks are left until later in the process and "reverse engineered" to match the design, their usefulness as catalysts for dialog, cost and risk management, and quality tracking tools is lost.



PRE-DESIGN PHASE

- ✓ What is the intent of the Commissioning
 - Deficiencies in Installation
 - Functionality of all Systems
 - Energy usage reduction
 - Adherence to codes
- ✓ Starts the process of analyzing initial data
- ✓ Develops budget guidance
- ✓ What will be Commissioned
 - The entire facility with all systems
 - Only designated systems - HVAC, lighting, emergency power, etc
- ✓ Provides capability for determining if retro commissioning is beneficial



PRE-DESIGN PHASE CXA OBJECTIVES



- Identify the Commissioning Team
- Develop the OPR
- Define the initial commissioning scope and budget
- Develop the initial commissioning plan
- Verify that the building program is consistent with the OPR.
- Integrate commissioning into the overall project delivery process and begin building the CXA Team



PRE-DESIGN PHASE CXA ACTIVITIES

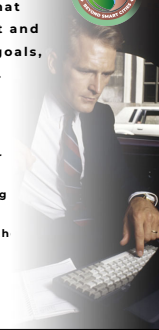
- ✓ Owner designates a party to act as their project representative for commissioning related activities.
- ✓ Owner selects /designates a Commissioning Provider for the project.
- ✓ Develop the OPR for the Project
- ✓ Define the commissioning scope, schedule and budget.
- ✓ Incorporate commissioning into the project budget and schedule.
- ✓ Develop the Commissioning Plan. Each project is commissioned in accordance with a written commissioning plan that is updated as the project progresses.
- ✓ Develop the Issues Log format and protocols.
- ✓ Review the Building Program.
- ✓ Prepare the Pre-Design Phase Commissioning Report.



PRE-DESIGN PHASE CXA PLAN

The Commissioning Plan is an ever-changing document that begins its life during the pre- design phase of the project and identifies all of the steps needed to achieve the project goals, and the order in which these steps need to be completed.

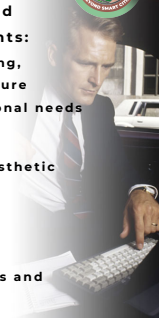
- ☑ If not already complete, collect the information needed for the design narrative and basis of design, and assemble these documents
- ☑ Name the Commissioning Plan Team members and specify their roles and duties
- ☑ State the testing methods for measuring performance, including the sampling plan
- ☑ List the systems and equipment to be commissioned and what th criterion for approval will be.
- ☑ Review the Preliminary Commissioning Plan with the owner, or owner's representative, and the design team



OWNER'S PROJECT REQUIREMENTS DOCUMENT

The Owner's Project Requirements document would contain, among other things, the following elements:

- ☑ General requirements for the functioning of the building, including its essential use, expectations for possible future expansion or renovations, and maintenance and operational needs
- ☑ Space planning, Timeline for expected occupancy
- ☑ Targets for sustainability, reliability, and durability Aesthetic goals
- ☑ Materials and workmanship standards and quality
- ☑ Documentation needs
- ☑ Training requirements and expectations Required codes and standards



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