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ONLINE TRAINING BY KRISHNAJI PAWAR
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MODULE

04 - A

CxA Team and Managing CXA Projects

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CERTIFIED COMMISSIONING MANAGER - CCM TRAINING OVERVIEW

The CX Team is indispensable to the process of commissioning building systems. The CxP cannot independently complete commissioning activities and deliverables. Typical Cx Team members include specialty trades, specialty consultants, suppliers, and manufacturers; equipment and system start-up specialists; building automation system (BAS) programmers; and information technology (IT) staff or consultants.

Learning Objectives

- A commissioning team
- The commissioning provider
- Occupants, end users, operations, and maintenance
- Architects and design professionals
- The General Contractor
- Electrical, mechanical, and plumbing contractors
- Exterior enclosure contractors
- Testing Firms & Comparing commissioning approaches
- Cost comparison & Conflict of interest comparison
- The integrated approach

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WHAT ELEMENTS COMPRISE A COMMISSIONING TEAM?

- If there were only one answer, the length of this lecture would be approximately 5 minutes.
- The fact remains, however, that there are numerous possible configurations for a construction project's commissioning team.
- In addition, there are many factors to consider when making a decision, such as the expertise required to perform the various tasks, the optimal costs to complete the tasks, the potential for delays in project completion, and the potential for conflicts of interest.
- This lecture will attempt to contextualize these factors so that the best decisions can be made for the organization's specific requirements.

THE DEFINITION OF COMMISSIONING

- “The Commissioning Process is a quality-oriented process for achieving, verifying, and documenting that the performance of facilities, systems, and assemblies meets defined objectives and criteria.” ASHRAE Guideline 0
- “…a systematic, documented, and collaborative process including inspection, testing, and training.”
- “…conducted to confirm that a building and its component system meet the requirements of the occupants and conform to the design intent.”
- “…a quality assurance procedure applied to building construction throughout the entire project…”





Commissioning Plan: A document that outlines the commissioning process and is developed with following phases of the project.

Systems Manual: A composite document that broadens the scope of the operations manual and maintenance manual by incorporating the additional information gathered during the commissioning process.

Functional Performance Testing: The process of determining the HVAC system's capacity to provide heating, ventilation, and air conditioning services according to the final design intent.
(For the purposes of this guide, functional performance testing includes not only HVAC systems, but also all other building systems, both dynamic and static, for which the owner desires to drive performance through a rigorous functional performance testing program.

Functional Performance Test Procedures: Detailed, step-by-step procedures for conducting functional performance tests on each piece of equipment and system, including provisions for verifying all pertinent data, recording the results obtained, and identifying the parties involved in each test.

Acceptable Performance: The capability of a component or system to meet the specified requirements under all actual load ranges.
Statement of Readiness: A document stating that all equipment, systems, and controls have been installed, operated, tested, adjusted, and balanced, and are ready for functional performance testing and other acceptance procedures.

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ASHRAE: American Society of Heating Refrigerating and Air-Conditioning Engineers is an international organization with a mission of advancing heating, ventilation, air conditioning and refrigeration to serve humanity and promote a sustainable world through research, standards writing, publishing and continuing education.

Basis of Design (BOD):The documentation by the design team of the primary thought processes and assumptions behind design decisions that are made to meet the Owner's Project Requirements. The BOD describes the assumptions used for sizing and selection of systems (i.e. codes, standards, operating conditions, design conditions, weather data, interior environmental criteria, other pertinent design assumptions, etc.).

Commissioning: The process of ensuring that systems are designed, installed, functionally tested, and capable of being operated and maintained to perform in conformity with the design intent
(owner's project requirements).



Design Professional: The architect, architect-engineel, responsible for the design and preparation of documents for the building systems.

Testing Contractor: Although this term is used in ASHRAE Guideline 1-1996, it is not defined. However,the definition would be: The person, company, or agent responsibleto the prime contractor for developing, scheduling, and carrying out the commissioning plan test procedures and all associated requirements as specified.

Owner's Project Requirements: A written document that specifies the functional requirements of a project and the usage and operation expectations. This includes project and design objectives, performance criteria that can be measured, budgets, schedules, success criteria, and supporting information.

Commissioning Team: Those people responsible for working together in carrying out the commissioning process.

Commissioning Authority: The designated person, company, or agent who implements the overall commissioning process.

COMMISSIONING TEAM

FOR THE PROJECT TO BE SUCCESSFUL, ALL STAKEHOLDERS MUST WORK TOGETHER!





COMMISSIONING TEAM MEMBERS

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The term “Commissioning Team” (or “Cx Team”) is broadly accepted in today’s construction industry and is understood to mean the key parties that collaborate on a project to implement the commissioning process.



Potential team members:

- Equipment Vendors
- Specialty Trades
- Specialty Consultants
- Program Manager
- Service contract providers
- BAS Specialists
- IT Support Groups



COMMISSIONING TEAM ROLES

These are the usual responsibilities and roles of the commissioning team.Before transitioning to the pre-commissioning and commissioning phases, it is essential to define these early in the project.



Owner or Operator

- Develop the owner's project requirements.
- Assign a team member and attend meetings;
- Retain a commissioning provider;
- Communicate project requirements to the design team;
- Coordinate facilities and staff participation;
- Conduct regular site observations.
- Assign a person to be responsible for overall system knowledge.
- Organize personnel to be demonstrated to and trained.
- Sign-off “Demonstration to the Owner”

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COMMISSIONING AUTHORITY (CXA)

New construction or existing facility building systems commissioning is led by the Commissioning Authority (CxA). The CxA's main job is to update the owner, design team, and construction team on the building systems' status, integration, and performance. CxAs should remain objective throughout projects.



- Oversee the owner’s commissioning process.
- Review the owner’s requirements and basis of design.
- Prepare a project commissioning plan.
- Review the design documents. Ensure that the project specifications are written to support the project commissioning plan, including a detailed review and comment on trade-specific commissioning sections, particularly the Mechanical Commissioning Agent’s specification section.
- Hold or attend regular design stage and construction phase commissioning meetings as required.
- Make sure that the trades adhere to the project specification requirements when implementing the commissioning process.
- Review and comment on the commissioning schedule (the commissioning manager may prepare the commissioning schedule).

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DESIGN PROFESSIONAL

The architect, designer, design consultants, and support staff make up a building systems commissioning design team. The licensed design team's main duties are reflecting the owner's goals and producing construction contract documents.



- Appoint a team member and be present at meetings.
- Consider naming conventions for rooms.
- Coordination of design and modifications with the owner and end users.
- Perform routine site inspections.
- Assign members of the Cx team and attend meetings.
- Provide a design foundation.
- Respond to RFI and CO requests.
- Perform routine site inspections.
- Coordination of design and modifications with the owner and end users.
- Examine O&M manuals, as-built drawings, and other specified documents.
- Documentary evidence

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GENERAL CONTRACTOR (GC)

The general contractor (GC) oversees on-site construction and coordinates commissioning with the commissioning provider (CxP) and contractors. Most of the GC's work is during construction, but they may have responsibilities during occupancy and operations.



- Implement commissioning per the specifications.
- Assign a team member and attend meetings.
- Project Scheduling
- Manage the overall completion of work.
- Manage project documentation.
- Coordination of contractors
- Maintaining specified building conditions
- Quality Control of their scope.
- Provision of O&M documentation of Contractor supplied equipment..Submitting vendor equipment start-up and testing procedures with safety information.
- Preparing system/equipment specific installation checklists (ICL).
- Submit completed Installation Checklists and Performance Verification forms.
- Performing start-up, testing and performance verification activities with input/participation of major manufacturer’s representatives within Commissioning Team activities.

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MECHANICAL CONTRACTOR

Mechanical, electrical, and plumbing (MEP) contractors are essential to building systems commissioning. Project scope and scale determine the number and type of MEP contractors on the construction team. Contractors mostly work during construction, but some may also work during occupancy and operations.



- Mechanical Contractor (common among subcontractors)
- Appoint a team member and be present at meetings.
- Manage vendors and subcontractors.
- Progress Reports (SVCs)
- Coordinate equipment initialization
- Perform system operations as specified for functional performance testing.
- Plan and execute. Staff training in O&M
- Provide O&M manuals, as-built drawings, and additional documentation as required.

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VENDORS / TESTING AGENCIES /TAB

Testing, adjusting, and balancing (TAB) companies balance air and hydronic systems, mostly HVAC systems. This is crucial to commissioning. Subcontracts usually go to mechanical subcontractors or prime contractors.



- Maintains relationships with outside contractors
- Start up the equipment, and turn in the necessary documentation.
- Make available testing equipment that has been calibrated.
- In the event that it is required, support commissioning testing.
- Make sure to provide owner's training performed by qualified personnel.

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SUPPLIERS

During the construction phase, suppliers furnish materials, components, and equipment for building systems. Depending on the system, suppliers may consist of vendors that sell and/or install products from multiple manufacturers, as well as manufacturers that sell and install their own products.



- Coordinate and schedule on-site dates for delivery and/or installation with the appropriate contractors.
- Install, adjust, and/or participate in equipment and system start-up.
- Submit the specified documentation.
- Provide calibrated specialty testing equipment.
- support commissioning testing as specified in the project specifications.
- As specified in the project specifications, provide qualified personnel to conduct owner and operations and maintenance (O&M) staff training.

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EXTERIOR ENCLOSURE CONTRACTORS

The BEC must provide a building envelope that meets OPR or CFR standards, ensuring energy efficiency and safety. A watertight and airtight building, excluding HVAC systems, is cheaper to operate and maintain.



- Provide access to scaffolds, man-lifts, or other mechanical conveyances used by the exterior wall contractors for the execution of commissioning tests.
- Correct deficiencies identified by the CxP during the commissioning process.
- Provide training to the owner, owner's representative, and/or operations and maintenance (O&M) staff as required by project specifications.
- Prepare a preliminary schedule for exterior wall assembly testing for use by the CxP. Update the schedule as needed during the project.
- Notify the GC, architect, and CxP when exterior wall assembly tests are going to occur.

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