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COMMISSIONING SPECIALIST
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CONSTRUCTION PHASE
COMMISSIONING PROCESS
ONLINE PROFESSIONAL COURSES LED BY THE WORLD'S TOP SPECIALISTS
ONLINE TRAINING BY KRISHNAJI PAWAR
LEED AP(BD+C),GSAS CGP,GCP,ISO 14001
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MODULE 3

Commissioning Progress Meetings

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CONSTRUCTION PHASE COMMISSIONING PROCESS OVERVIEW

Members of the Cx Team are accountable for attending Construction Phase meetings and completing action items by their due dates. Effective commissioning and a successful project for the owner are dependent on the full cooperation of all meeting participants.

Learning Objectives

- Introduction and Construction Phase Overview
- Commissioning Progress Meetings
- Installation Review
- Testing Contractor
- Commissioning Plan and Schedule
- Submittals,Equipment and materials
- O&M and Systems Manuals
- Training Plan and Materials

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INTRODUCTION

- The construction phase is the third of the four phases we've identified for the building systems commissioning process.
- This phase comes immediately after the design phase and comes before the occupancy and operations phases.
- The third phase of the commissioning process outlined in the BEYOND SMART CITIES Commissioning Specialist Manual was the construction phase.
- The Commissioning Plan (Cx Plan), which was updated by the Commissioning Provider (CxP) during the Design Phase, is implemented during the Construction Phase.
- Consistent interaction between the CxP and the construction team, as well as frequent communication between the CxP and the design team, are essential to the construction phase's success.
- The CxP leads both the larger Commissioning Team (Cx Team) and the smaller Commissioning Provider Group (CxP Group) to ensure commissioning activities are completed correctly and on schedule
- Verifying building system compliance with the OPR or CFR is one of the most important priorities for the CxP during the construction phase.



COMMISSIONING PROGRESS MEETINGS



- The reconstruction commissioning conference could also be referred to as a commissioning process meeting because its primary purpose is to acquaint all construction-phase commissioning participants with the details of the commissioning process and with the commissioning program for the project at hand.
- Thereafter, monthly commissioning progress meetings shall commence and continue until acceptance testing for commissioning commences, at which point weekly commissioning progress meetings shall commence.
- The two-week look-ahead schedule was agreed upon.
- Ensure that everyone is aware of the commissioning workload for the upcoming week.
- Adapting the composition of the commissioning team to current commissioning activitiesImportant to the success of all commissioning progress meetings are the meeting's conduct and the attendees.
- At all times, a professional and cooperative atmosphere must be maintained.
- These meetings are not intended to determine "who's at fault."
- A friendly and cooperative environment will encourage positive responses and persistence.

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INSTALLATION REVIEW

- During the construction phase, one of the primary responsibilities of the commissioning authority is to monitor construction progress, with a particular focus on the installation of equipment and systems and the quality of the workmanship, bearing in mind that the commissioning authority is responsible for quality assurance and the contractor is responsible for quality control.
- Since commissioning progress meetings will occur on a regular basis, the CxA should review construction quality and progress at each meeting.
- During the period of only monthly meetings, it may be necessary for the CxA to conduct additional site visits, especially when the subcontractors are just beginning to install the first of what could be dozens or even hundreds of similar subsystems throughout the facility.
- This is the time to inspect a typical first installation for a variety of problems, including:The installation of systems and equipment conforms to the plans, specifications, and manufacturer's recommendations.
- does not obstruct required access for operations and maintenance.





INSTALLATION REVIEW +

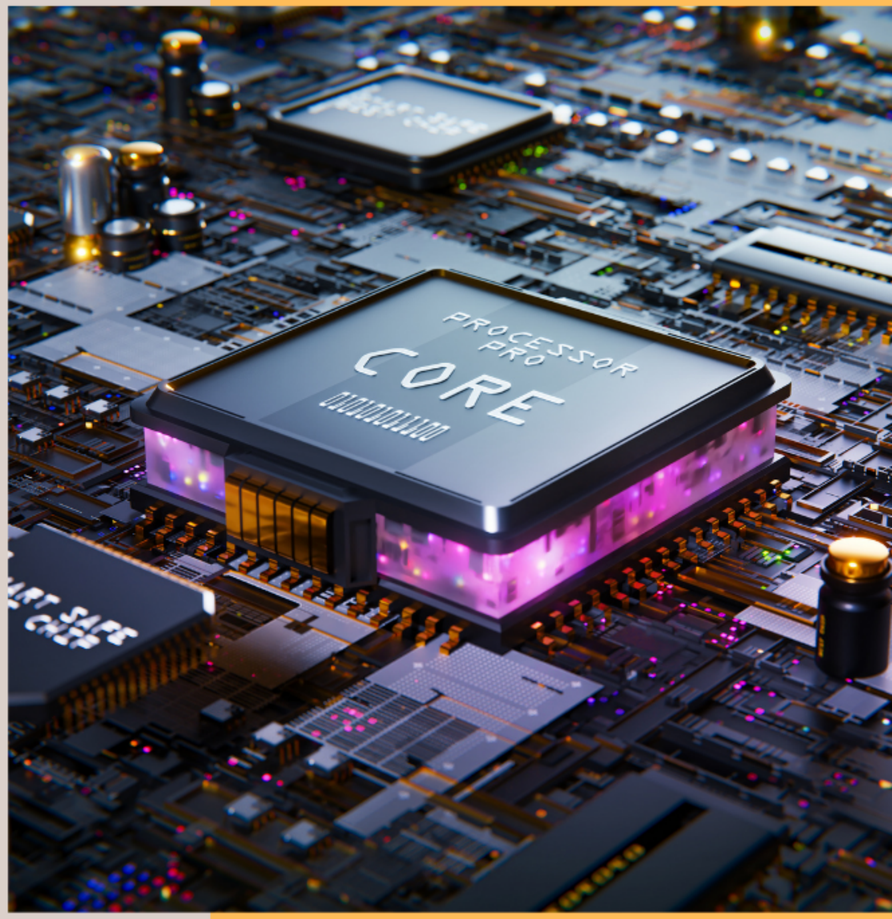


- It is imperative that the CxA conducts these intensive installation reviews as soon as possible to ensure that contractors are attentive to all performance and operational reliability requirements.
- This type of review leads to projects being completed on time and within budget.
- The CxA should take the time early in the construction phase and prior to each subsequent site visit to develop and implement a planned installation review procedure that will ensure an effective sampling of all installations as they are initially implemented.
- As with commissioning progress meetings, installation review comments must be addressed in a professional and cooperative manner, emphasizing to all parties the importance of completing the work correctly the first time to avoid having to undo and redo unacceptable installations.
- To maintain cordial working relationships and to continue fostering teamwork among all participants, the tone of the CxA's review comments must remain considerate, helpful, and cooperative.

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TESTING CONTRACTOR

- The specification requires the prime contractor to hire a testing contractor (TC) for large, complex projects.
- The owner, CxA, and design professionals will decide on a testing contractor during design.
- If needed, a testing contractor must be approved before the reconstruction commissioning conference.
- Thus, the CxA must attend the pre-construction conference to meet with the general contractor and emphasize the importance of selecting and approving the testing contractor on time to avoid delaying the pre-construction commissioning conference.
- Testing contractors must attend the reconstruction commissioning conference.
- The specifications must include a subsection on testing contractor qualifications and duties.
- Comments are needed in this appendix:The prime contractor must submit testing contractor qualifications for owner approval.
- Contractors must prepare and distribute Contractor Letters of Authority to owners, project managers, and subcontractors.





COMMISSIONING PLAN AND SCHEDULE



- As a guide for the commissioning program, the specifications must include a copy of the commissioning plan that was started during the pre-design phase and expanded during the design phase.
- After the TC has been selected and the pre-construction The commissioning conference has been completed; the next step is to integrate the results of that activity into the construction schedule.
- It is not easy to integrate commissioning activities into the construction schedule.
- Generally, as the upper levels of multistory buildings are still being erected, mechanical and electrical systems are being installed on the lower levels.
- Installation of HVAC terminal units and related DDC controls is completed at lower levels; commissioning testing of those components and subsystems can begin while the upper floors are still being built.

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COMMISSIONING PLAN AND SCHEDULE +

- However, if completion of the electrical subcontractor's work relative to this equipment has not been coordinated according to the same schedule, commissioning testing cannot begin when the mechanical work is ready for testing.
- Because of the testing contractor's extensive experience with this kind of coordination, the TC is best suited to facilitate the coordination and scheduling of the disciplines in order to meet the objectives of the commissioning program.
- When the commissioning plan and schedule submittal have been reviewed and completed to the mutual satisfaction of the design professionals (with the CxA's concurrence) and the prime contractor, copies of the approved plan and schedule must be distributed to all affected parties for their guidance in doing their work.



SUBMITTALS

- All submittal requirements for the selection of equipment, materials, and related information must be specified in the specifications.
- However, it Historically, the contractor has provided submittal materials.
- It is now necessary to submit additional copies of selected submittal materials for the CxA to review, for use solely by the design professional.
- The CxA's review of submittals is not a duplication of the DP's review; rather, the CxA focuses on the commissionability of the equipment.
- Consequently, the CxA's review comments must be transmitted to the P for incorporation with the DP's review comments.



EQUIPMENT AND MATERIALS





- In the construction industry, submittal requirements for equipment and materials are generally well understood.
- The P does not want promotional catalog content; he or she requires installation and operation details to evaluate functionality in relation to intended system dynamics.
- Since the commissioning process involves testing systems and equipment in a variety of operating modes, there is a greater emphasis on the need for data and curves pertaining to part-load performance.
- This is due to the fact that operational readings will be taken during testing to ensure conformance with the manufacturer's performance data, the construction documents, and the owner's project specifications.

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SHOP DRAWINGS

The commissioning program focuses much more attention on the formality and use of shop drawings, the purpose of which is twofold:
1) to demonstrate how components and equipment will be connected to create a working system, and

(2) to demonstrate how all systems in common spaces throughout the facility will be arranged to fit into the spaces and preserve operation and maintenance access.





INSTALLATION AND STARTUP INSTRUCTIONS



- Commissioning introduces a new discipline for equipment startup.
- If a carefully developed startup procedure is not followed for large, complex equipment like chillers, permanent damage may result, which may not be apparent for months.
- Installation and startup instructions must be submitted with operation and maintenance manuals.
- The testing contractor and commissioning authority can develop commissioning test procedures, including equipment startup, according to manufacturer recommendations to preserve operation and maintenance.

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SUBMITTALS

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O&M AND SYSTEMS MANUALS





- Commissioning introduces a new discipline for equipment startup.
- Installation and startup instructions must be submitted with operation and maintenance manuals.
- Thus, the testing contractor and commissioning authority can develop commissioning test procedures, including equipment startup, per manufacturer recommendations.or function can be maintained.
- Operation and maintenance manuals were traditionally written near the end of construction, before project completion.

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O&M AND SYSTEMS MANUALS+

- The testing contractor should start creating the O&M and systems manuals during submittal and have them ready while producing the commissioning test procedures to comply with manufacturer recommendations and warranty restrictions and show how the approved equipment and systems are configured and controlled.
- Specifications must require O&M, system, and other submittals.
- The systems manual is new.
- Ideally, the owner should start the systems manual during predesign.
- The systems manual should be started during project design if it's not finished then.
- For commissioning, the prime contractor must receive the systems manual format and draft.



TRAINING PLAN AND MATERIALS





- In the past, training for the operations staff of the owner has not been sufficiently emphasized or formally organized and scheduled.
- In order to sustain the benefits of the commissioning program, it is crucial that the owner's operations staff be adequately trained and included in the commissioning process as commissioning test witnesses, so that they can experience the dynamic operation of the systems firsthand.
- As with all other commissioning activities, staff training requires a plan and discipline.

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TRAINING PLAN AND MATERIALS+





- As a result, developing the training plan and schedule, as well as choosing qualified instructors and top-notch training materials that have the design professional's approval, is another specified requirement for the prime contractor.
- Included in the plan must be staff training on the owner's project requirements, design principles, and design philosophies developed by the design professional.

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