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COMMISSIONING SPECIALIST
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PRE- AND POST-OCCUPANCY 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 7

Acceptance Phase Overview

KRISHNAJI PAWAR - CEO & FOUNDER

LEED AP(BD+C),GSAS CGP,GCP,ISO 14001

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PRE- AND POST-OCCUPANCY PHASE COMMISSIONING PROCESS OVERVIEW

Although some construction phase activities may continue, pre- and post-occupancy typically begin at Substantial Completion, when the building is turned over to the Owner. Project closeout activities, as well as long-term building performance maintenance and performance processes, are developed and implemented during the Occupancy and Operations Phase.

Learning Objectives

- Introduction
- Acceptance Phase Overview

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INTRODUCTION

- It was determined that the Pre- and post-occupancy CxA phase is the final phase of the building systems commissioning procedure.
- The commissioning process outlined in the commissioning specialist manual comprised five phases, with acceptance and post-acceptance being the final two.
- The Occupancy and Operations Phases consist of these two phases.
- Some commissioning providers (CxPs) may still use acceptance and post-acceptance instead of occupancy and operations.
- The Occupancy and Operations Phase can continue indefinitely if the owner retains the CxP for some form of ongoing commissioning (OCx).

ACCEPTANCE PHASE OVERVIEW

- Definitions
- BAS Point-to-Point
- BAS Graphics
- Review the TAB Report
- Review of the Electrical Test Report
- Functional Performance Tests (FPT's)
- O&M Training and Documentation
- Commissioning Report



DEFINITIONS

""Acceptance: a formal Action, taken by a person with appropriate authority(which may or may not be Contractually defined) to declare that some aspect of the project meets defined requirements, thus permitting subsequent activities to proceed."

Source: (ASHRAE 202-2015)
NOTE: Each submission of a commissioning deliverable (e.g., BOD, Cx Plan, Specifications, etc.) must be reviewed and approved by the Owner in order to facilitate the next phase of the design process. Both the owner and the Cx A must evaluate and approve the OPR.

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DEFINITIONS

“”Performance Test (PT): performance testing is the process of verifying that a material, product, assembly or system meets defined performance criteria. The methods and conditions under which performance is verified are described in one or more test protocols.”
Source: (ASHRAE 202-2015)

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REVIEW BAS POINT-TO-POINT AND GRAPHICS

- The equipment, component, and system are used to index the points list.
- The list contains all of the submitted points.
- Includes action/data demonstrating accuracy and excitement
- Tabular layout
- Individual pages are displayed with the necessary visible points.
- The controls for navigation are labeled.
- The labeling conforms to the contract documents.
- Visual continuities between pages





REVIEW TAB REPORT

- The pages are numbered and indexed.
- The report accounts for all equipment.
- There is no "extra" equipment listed in the report
- Issues adequately documented in footnotes

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REVIEW THE ELECTRICAL TEST REPORT

- Examine the Electrical Testing Report:
- The report accounts for all equipment;
- The study of coordination applied
- Deficiencies outlined Applying acceptance criteria
- Industry specifications and norms



FUNCTIONAL TEST COORDINATION

- CxP, BAS contractor, design engineer, and owner to review FPTs and schedule
- Examine the Cx FPT Schedule • Durations, objectives, and procedure for eficiencies
- A BAS contractor performs FPTs without CxA to prove readiness.

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FUNCTIONAL TEST COORDINATION+

- Coordinate infrastructure milestones down to terminal components.
- Include FA, emergency power, and security in the plan for testing.
- Ensure the presence of specialty contractors and vendors.

FUNCTIONAL PERFORMANCE TESTS (FPTS)

- Systems tested in accordance with the CX Plan
- Valve and damper "failure" modes are not software-driven.
- The system is networked correctly.
- Workstation graphics: what are the pertinent responses?
- Optimal, Occupied, or Unoccupied Start



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FUNCTIONAL PERFORMANCE TESTS (FPTS)

- Coordinate infrastructure milestones down to terminal components.
- Include FA, emergency power, and security in the plan for testing.
- Ensure the presence of specialty contractors and vendors.



TEST ACCEPTANCE

- Individual System Testing (IST) follows Functional Performance Testing (FPT).
- ISOT (Integrated Operational System Testing) is the result of IST.
- Demonstrate acceptance at the building or system level.
- Increasing complexity of integration.

O&M DOCUMENTATION

- Manuals include useful maintenance documentation.
- Components lists
- Beginning and ending procedures,
- Diagnostic procedures and emergency measures
- Recommended service intervals and maintenance
- Correct indexation and tabs
- Documentation furnished prior to training
- Supplemental documentation furnished during training



TRAINING PLAN

Definitions : (from ASHRAE 202)
Training Plan: a written document that details the expectations, schedule and deliverables of the Commissioning Process Activities related to Training of the project operation and maintenance personnel, users, and occupants.



TRAINING PLAN+

- Training agenda tailored for OPR
- Training for systems and components
- Properly scheduled around O&M shifts, staffing
- Qualified trainers, not sales personnel
- Engineers, CxA, provide system-intent-level training.



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FINAL COMMISSIONING REPORT

"Final Commissioning Report: should include (but not be limited to) the following:

- Copy of the final Cx Plan
- Copy of the Cx Design and Review Reports
- Copy of testing and startup reports, evaluation checklists, and testing
- Checklists Completed for Commissioned Systems and Assemblies
- Copy of all Cx Progress Reports
- Copy of Issues and Resolution Log
- Items Resolution Plan for Open Items"

Source: (ASHRAE 202-2015)





COMMISSIONING REPORT

- Effective indexing and tabs
- Documentation for every stage
- Executive Synopsis
- Provide supporting documentation (operational sequence, control schematics, etc.).

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SYSTEMS MANUAL

"Systems Manual: should include but not be limited to the following:

- Executive Summary
- Facility Design and Construction
- Building, Systems, and Assemblies Information for Cx'ed Systems Facility Operations
- Training
- Final Commissioning Report"

Source: (ASHRAE 202-2015)

SYSTEMS MANUAL+

- LEED v4.1 Guideline provides good guidance on system manual components.
- Work with the Owner

1. Define usage requirements.
2. Electronic delivery
3. Web-based
4. How will the O&M team in the building store or reference it?

- Have they received SOMM's previously? Do they have a standard or a preference you should follow?
- Assembly of the manual is not solely the responsibility of CxA.
- Develop a responsibility matrix and include it in the CX Plan.





POST-ACCEPTANCE PHASE OVERVIEW

- Correct unresolved deficiencies and conduct the required re-tests.
- Carry out specified off-season testing.
- Perform specified post-occupancy monitoring.
- Review usage changes.
- Update commissioning documentation.



CORRECT UNRESOLVED DEFICIENCIES

- Unresolved RTF (Resolution Tracking Form) issues
- Uncompleted CM/owner punch lists
- Conduct the required re-tests.
- Outstanding or additional training

CARRY OUT SPECIFIED OFF-SEASON TESTING

- Coordinate with the owner and the O&M team
- FPTs per the Commissioning Plan
- Choose a near-design day.
- Build on completed FPTs
- Utilize BAS trending prior to testing.



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POST-OCCUPANCY MONITORING

- Scheduled site visits
- Remote (web) monitoring
- Warranty items
- Owner conference
- User conference



REVIEW USAGE CHANGES





- Computers and office machines;
- Furniture placement
- Occupancy change
- Close to the office
- Energy-saving methodology

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UPDATE COMMISSIONING DOCUMENTATION

- Resolve issues
- Off-season tests
- Usage changes
- Provide additional volume for the Cx Report.



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CONTINUOUS OR ONGOING COMMISSIONING PLAN

- Encourage the O&M team to repeat BLANK FPTs, ISTs seasonally, and major renovations.
- Document modifications;
- Part of the PM Plan

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BEYOND SMART CITIES

CONTACT US

+91 6363032722

info@beyondsmartcities.in

learn.beyondsmartcities.in

#55,HMR Layout ,Bengaluru ,India



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