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BEYOND SMART CITIES



CERTIFIED COMMISSIONING TECHNICIAN

CXT OVERVIEW

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MODULE

2

Definition and History of Building Commissioning

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CERTIFIED COMMISSIONING TECHNICIAN CXT OVERVIEW

Building commissioning is a systematic process that ensures a building's systems and components are designed, installed, tested, operated, and maintained according to the owner's operational needs and design documentation. It includes stages like pre-design, design, construction, occupancy, and operations.

Learning Objectives

- Course Overview and Introduction
- Definition & History of Commissioning
- Why is building commissioning needed?
- Technical, communication, and CX skills
- Commissioning Process Overview
- CX Technicians (CxT) Responsibilities
- Specialist Certification in CX Services
- Cost and benefits of building CX
- CX Challenges and Emerging Issues
- Summary and Resources
- CxT Practice Exam: Test Your Knowledge!



INTRODUCTION

- A systematic process that ensures a building's systems and components are designed, installed, tested, operated, and maintained according to the owner's needs.
- The process includes stages: pre-design, design, construction, occupancy, and operations.
- The evolution of commissioning has been influenced by advancements in building technology and changes in the construction industry.
- Early practices focused on ensuring mechanical systems operated effectively.
- Post-World War II, new technologies and complex building systems necessitated a structured commissioning process.
- The energy crisis in the 1970s led to increased focus on energy efficiency and HVAC system performance.
- By the 1980s, the commissioning process took on a formal structure with the National Institute of Building Sciences establishing guidelines.
- Regulatory changes and standards like ASHRAE Standard 202 and LEED rating system institutionalized the commissioning process.
- Current trends emphasize sustainability, resilience, and occupant health, with concepts like "enhanced commissioning" and "continuous commissioning."
- Technologies like BIM and IoT are increasingly integrated into commissioning practices for real-time monitoring and data-driven decision-making.

MODERN BUILDING SYSTEMS OVERVIEW

- Modern buildings consist of advanced, integrated, and interdependent building systems.
- These systems include visible exterior glazing, concealed interior pipes, wires, ducts, and cables.
- Building systems may consist of sensors, controls, equipment, materials, and subsystems.
- The complexity of building systems has increased due to new building products, smart building designs, stringent safety and sustainability requirements, and increased demand for efficiency and profitability.
- Building systems commissioning is a systematic process facilitated by a commissioning provider (CxP) and a team including the owner, design and construction teams, suppliers, testing agency professionals, and O&M staff.



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...”





HISTORY AND IMPORTANCE OF BUILDING COMMISSIONING

- The building design and construction industry underwent significant refinement in the latter half of the 20th century.
- Phases of project development include predesign, schematic design, design development, construction documents, bidding, construction, warranty, and operation and maintenance.
- The introduction of building commissioning is a recent improvement, despite being in its infancy within the construction industry.
- The complexity of building systems has increased due to stricter energy conservation regulations, safer work environments, advanced phonic, image, video, and data communications technologies, and transforming research and teaching methodologies.





HISTORY AND IMPORTANCE OF BUILDING COMMISSIONING+



- Traditional methods for building start-ups and final acceptance proved inadequate in the 1980s and 1990s.
- Building commissioning was born to shorten or eliminate the stressful break-in period for occupants and operating staff.
- Commissioning has existed for hundreds, if not thousands, of years, possibly starting with the use of watercraft for transportation.
- Modern naval vessels undergo a rigorous commissioning process upon completion of construction to ensure their combat readiness.

HISTORY AND IMPORTANCE OF BUILDING COMMISSIONING++

- With the introduction of production lines, commissioning lines of equipment became essential to ensure flawless, sequential operation of the associated apparatus.
- The increasing use of commissioning in the bulldozing design and construction industries is a novel concept due to the failure of traditional building start-up methods and the health, safety, and energy consequences of failure.



COMMISSIONING TECHNICIAN ROLE OVERVIEW



- Communication Skills: Effective communication is necessary for conveying technical information and collaborating with diverse teams.
- Examples include overseeing HVAC systems in commercial buildings, complex control systems in industrial settings, and network systems in the IT sector.
- Role helps mitigate risks, enhance operational efficiency, and ensure regulatory compliance.

COMMISSIONING TECHNICIAN ROLE

- The Commissioning Team (Cx Team) is defined by Beyond Smart Cities as the group of professionals who perform commissioning activities or contribute to commissioning deliverables as part of the building systems commissioning process.
- The precise size and composition of the Cx Team will vary from project to project, but typical members include the Commissioning Provider (CxP), the owner or owner's representative, and select members of the design and construction teams.
- Certain operations and maintenance (O&M) personnel are frequently integral members of the CX Team throughout the building systems commissioning process for existing facility projects.



WHO IS A COMMISSIONING AUTHORITY OR SPECIALIST?

- Knowledge of HVAC systems, including design, control strategies, installation, operations, and maintenance.
- Experience in HVAC controls, including current technology.
- Practical field construction background.
- Ability to organize specific activities into a coherent commissioning plan.
- Proficient in documentation and multi-disciplinary team work.
- Familiarity with testing and balancing.



COMMISSIONING TEAM

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COMMISSIONING TEAM+



- In today's construction industry, the term "commissioning team" (or "CX team") is commonly understood to refer to the key parties who collaborate on a project to implement the commissioning process.
- However, this term is not universally accepted, so ANSI/ASHRAE/IES Standard 202-2018: Commissioning Process for Buildings and Systems does not employ it.



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THANK YOU

