

BEYOND

SMART CITIES

TECHNOLOGY FOR SUSTAINABLE
DEVELOPMENT

REFRESHER TRAINING COURSE

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SUSTAINABILITY SPECIALIST

BEYOND SMART CITIES



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ONGOING COMMISSIONING
FOR BUILDING SCIENCE PROFESSIONALS

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LEARNING OBJECTIVES



Ongoing Commissioning (OCx)

Scope and Purpose of OCx, Phases of OCx

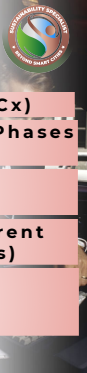
Evaluate building systems performance

Review and Update the Current Facility Requirements (CFRs)

Conduct a Gap Analysis of Existing Technology Infrastructure

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ONGOING COMMISSIONING (OCX)

Ongoing Commissioning is the means and process of investigation, evaluation, monitoring, and implementation of improvement measures related to facility performance on a continuous basis to maintain the built infrastructure to the performance standards of the Current Facility Requirements.

The scope of OCx includes existing buildings, systems and assemblies, which typically would be planned for/scoped/set up in the Occupancy and Operations Phase of NCCx or the Hand-Off Phase of EBCx.

The purpose of OCx is to maintain and continuously improve building performance for:

- ☑ Evolving CFRs due to change in facility use, system changes, and/or building renovations.
- ☑ Energy use reduction/containment while maintaining environmental condition requirements.
- ☑ Proactively identifying degradation in system performance for correction prior to occupant impact.
- ☑ Proactively identifying degradation in system performance for correction prior to operational

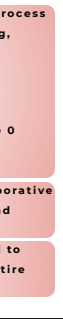


WHAT IS COMMISSIONING

Commissioning is: "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."
- ☑ "...a quality assurance procedure applied to building construction throughout the entire project..."



PURPOSE OF BUILDING COMMISSIONING

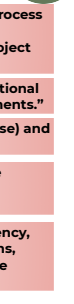
"The basic purpose of building commissioning is to provide a quality based process with documented confirmation that building systems are planned, designed, installed, tested, operated and maintained in compliance with the Owner's Project Requirements (OPR).

Commissioning of existing systems may require the development of new functional criteria in order to address the owner's current systems performance requirements."

The commissioning process ideally begins at project inception (predesign phase) and continues in phase-specific functions through facility and system operation.

It is not a design or construction function, but it assists in and verifies that the results of these functions can produce a facility and systems that meets the requirements for performance.

Depending upon the Owner's needs, these might include; functionality, efficiency, sustainability, environmental and health impacts, interior occupancy conditions, resilience, and others that will maximize facility and system profitability for the Owner and the occupants.



PHASES OF OCX

Ongoing Commissioning comprises the following sequential phases. Each phase is discussed in a separate section of this document.

- ☑ **Planning :** Initial team formation, communication planning and facility condition assessment. Includes documenting Owner's goals and objectives
- ☑ **Implementation:** Implementation of people and technology as applicable to enable the OCx process.
- ☑ **Sustaining :** Means and methods to transition OCx monitoring and sustained building performance to building operator and Owner core responsibilities.



REVIEW AND UPDATE THE CURRENT FACILITY REQUIREMENTS (CFRS)

- ☑ During the facility Condition Assessment, the CxP will review the CFR's to ensure these requirements are documented for the building, are up to date, and/or if the facility condition indicates significant variation to the CFRs.
- ☑ The CFRs serve as a foundation for defining how the building systems are operated to support the purpose of the building. Should the CFRs not be defined or are out of date, the CxP will work with the OCx team to document and/or update the CFRs.



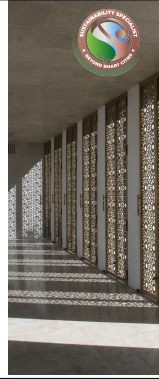
CONDUCT A GAP ANALYSIS OF EXISTING TECHNOLOGY INFRASTRUCTURE

- ☑ A gap analysis identifies where existing data acquisition systems (BAS, utilities, other monitoring) are incapable of, or are not currently gathering, specific data streams required for the OCx process.
- ☑ The technology- infrastructure gap analysis will be the foundation of understanding used in designing and determining the additional technology needs to meet the OCx project requirements. These additional technologies may include additional BAS or other monitoring system points, archiving and retrieval features, analytics software and interface, remote access features, etc.

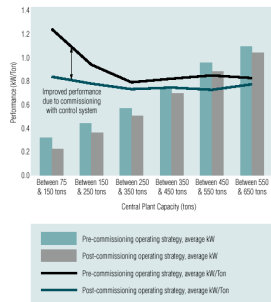


BENEFITS OF COMMISSIONING

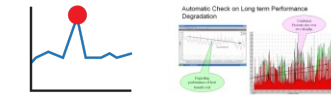
- ✓ Construction Efficiency
- ✓ Energy Efficiency
- ✓ Overcoming Technical Risks of Innovation
- ✓ Improved Indoor Environmental Quality (IEQ)
- ✓ Occupant Productivity
- ✓ Reduced Liability Claims
- ✓ Design and IAQ



VALUE OF COMMISSIONING HVAC SYSTEMS



Even short-term commissioning can substantially improve energy efficiency.



Fault Detection & Diagnostics



PROCESS PROBLEMS THAT COMMISSIONING HELPS SOLVE

- ✓ Design Goals/Criteria Forgotten or Distorted
- ✓ Designs Aren't shown Completely as Intended
- ✓ Construction Deviates from Design
- ✓ Systems Not Fine-Tuned at Start-Up
- ✓ Operators Not Properly Trained
- ✓ Systems Not Maintained

