

BEYOND

SMART CITIES

**CERTIFIED BUILDING COMMISSIONING
PROFESSIONAL - CBCP EXAM PREP**

KRISHNAJI PAWAR, LEED AP BD+C, GSAS CGP, ISO 14001:2015, GCP
COMMISSIONING SPECIALIST CURRICULUM

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GREEN BUILDING
COMMISSIONING

EXISTING BUILDING CXA OPPORTUNITIES

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LEARNING OBJECTIVES

Scheduling

Simultaneous Heating / Cooling

Conduct a building performance
assessment

Sensor, Actuator, & Setpoint Improvements

TAB Opportunities

SCOPE AND PURPOSE OF EBCx

Existing-Building Commissioning (EBCx) is similar in intent to new construction commissioning. Its purpose is to investigate, verify, improve, and optimize system performance. However, because Owners and project stakeholders are planning and executing the process within an operating—or even occupied—facility, the process differs in both scope and sequence.

Existing Building Commissioning (EBCx) is a systematic process for planning, assessing, investigating, analyzing, improving, optimizing and verifying the performance of building systems and assemblies.

The purpose of EBCx is most often to address facility conditions such as:

- ☒ A change in building use, ownership or functional requirements.
- ☒ The building uses more energy than it should or has in the past.
- ☒ The building has problems that impact the occupants or functional program.
- ☒ The systems and assemblies are in poor condition, or don't perform properly.
- ☒ An addition or alteration to the building.



SCHEDULING

Commissioning an existing building has been shown to be a key energy management activity over the last decade, often resulting in energy savings of 10, 20 or sometimes 30% without significant capital investment. It generally provides an energy payback of less than three years. In addition, building comfort is improved, systems operate better, and maintenance cost is reduced.

- ☒ Commissioning measures typically require no capital investment, though the process often identifies maintenance that is required before the commissioning can be completed.
- ☒ Potential capital upgrades or retrofits are often identified during the commissioning activities, and knowledge gained during the process permits more accurate quantification of benefits than is possible with a typical audit.
- ☒ Involvement of facilities personnel in the process can also lead to improved staff technical skills.



SCHEDULING

The contractor or specified commissioning agencies will commission following designer-approved processes. The designer will witness and verify them. Designers will sign PV forms to verify outcomes. The commissioning agency executing the tests will generate the requisite commissioning report, which the designer will certify and send to the Commissioning Manager, who reserves the right to verify a proportion of all reported results at no cost to the contract.



SIMULTANEOUS HEATING / COOLING

❑ The commissioning processes for new buildings and existing buildings are not the same because to the changes in the accessibility of the building systems, the occupancy of the facility, and other factors. New buildings are commissioned according to the original intent, and the process of commissioning new buildings involves ensuring that a space is ready to fulfill the requirements of its occupants as well as any applicable standards.

❑ It is difficult to ensure that new buildings are energy efficient because there is no set baseline for energy use. This makes the process more difficult. Instead, give the building its official commission. Ten commissioning agents work together to ensure that the building's operation is as energy-efficient as possible. This is accomplished by ensuring an optimal sequence of control, a balance of ventilation that prevents excessive simultaneous heating and cooling, and the installation of energy-efficient components.

❑ In contrast, owners of existing buildings start existing building commissioning (EBCx) initiatives in order to conserve energy while still keeping the design intent of the structure, rather of achieving the original design intent of the property. Although some of this information might be applicable to newly constructed structures, the vast majority of it is relevant to already existing buildings that are undergoing commissioning.



CONDUCT A BUILDING PERFORMANCE ASSESSMENT

Building performance evaluation is essential to better understanding and managing buildings. Build Test Solution's range of non-invasive and accurate measurement products provides the tools you need to carry out building performance evaluation efficiently and at scale.

Building Performance Evaluation (BPE) is the process of finding out how a building really works. It is also sometimes called "Post Occupancy Evaluation" (POE). Monitoring and evaluating the performance of a building means taking measurements on-site to get a custom understanding of that building instead of relying on assumed inputs to an energy model.



CONDUCT A BUILDING PERFORMANCE ASSESSMENT

The way a building works depends on its structure, its systems, how much energy it uses, and the people who live there. There are tools that can be used to look into each of these parts of a building's performance. These tools give valuable information about how a building works as it is.

Build Test Solutions' main job is to give people the tools they need to understand how the building's structure works. In particular, measuring how much heat and air flow there is are important ways to figure out how much energy a building needs and how comfortable it is inside.



SENSOR, ACTUATOR, & SETPOINT IMPROVEMENTS

Priority must be given to the Functional Performance Testing specifications for the BEMS and its actuators, sensors, connections, control units and software. Functional Performance Testing consists of:

- Checking the sensors and *re-calibrating* then (if required);
- checking the correct working of the actuators (a visual inspection is mandatory);
- identifying the signal conversion and tuning them (if required);
- identifying the control laws imbedded in the system (with all parameters concerned).

The functionality of the BEMS software and signalling from the sensors / components to the BEMS is of critical importance, without reliable component actions and measurement data, testing and analysis cannot proceed.



TAB OPPORTUNITIES

The HVAC systems of a building are the key to making a space comfortable and efficient. Testing, adjusting, and balancing (TAB) is what makes sure that the systems are working well. Using the right instruments for the TAB process is fundamental to making the right adjustments in order to achieve a productive system.

Verifying the design, installation, and TAB process of an HVAC system is one of the steps involved in commissioning a system. The education and expertise of the professionals that undertake TAB and commissioning work are significant, but the tools themselves are just as crucial to the success of these endeavours.



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