



Essential Attributes of Building Commissioning 2018 Update

The BCxA believes that diverse and creative approaches to commissioning benefit the discipline of building commissioning¹ and its clients. Therefore, this document focuses on identifying critical commissioning attributes and components, rather than attempting to dictate a rigid commissioning process. The attributes described herein are called “essential”, because the BCxA believes that they are, in fact, essential to every effective commissioning process. Applying additional commissioning best practices may enhance the process or add commissioning value. However, the BCxA believes that not including any of these Essential Attributes renders a process that becomes something other than formal commissioning². As a result, all BCxA members agree in writing to incorporate all of the Essential Attributes of Building Commissioning into every project for which they serve as a project’s Commissioning Provider, as defined in this document.

In order to clarify context for these *Essential Attributes*, and because the scope of commissioning varies between projects, the BCxA defines the basic purpose of commissioning as follows: It is the BCxA’s premise that, “The basic purpose of building commissioning is to provide documented confirmation that building systems³ function in compliance with criteria set forth in the Project Documents⁴ to satisfy the Owner’s operational needs. Commissioning of existing systems may require the development of new functional criteria in order to address the owner’s current systems performance requirements.”

¹ In this document, the term “building commissioning” refers to commissioning of complete buildings, building systems, and process systems located with the building.

² The BCxA recognizes that some projects may benefit from services and deliverables that do not include all of the Essential Attributes of Building Commissioning. While such scopes of work may add value to a project, the BCxA does not recognize them as complete commissioning processes. However, it is not the intent to restrict BCxA members from performing such services when they are clearly described as something other than full commissioning.

³The systems that must be commissioned for a functionally successful project may vary depending on the nature of the project; therefore, specific systems to be commissioned are not listed as essential attributes. However, as a means of maximizing indoor environmental quality and minimizing global environmental impact, the BCxA encourages total building commissioning, including mechanical, electrical, plumbing, automation and building enclosure systems.

⁴ In this document, the term Project Documents refers to planning and programing documents, as well as construction documents such as drawings, specifications, submittals, operating procedures and other documents relevant to the construction and operation of the building systems.

The Essential Attributes of building commissioning are:

1. The Commissioning Provider (CxP)⁵ is in charge of the commissioning process and makes the final recommendations to the owner regarding functional performance of the commissioned building systems.
2. The CxP is an objective, independent advocate of the Owner. If the CxP's firm has other project responsibilities, or is not under direct contract to the Owner, a conflict of interest exists. Wherever this occurs, the CxP discloses, in writing, the nature of the conflict and the means by which the conflict shall be managed.
3. In addition to having good written and verbal communication skills, the CxP has current engineering knowledge, and extensive hands-on field experience regarding:
 - Building systems commissioning,
 - Technical knowledge of building systems,
 - Building systems start-up, balancing, testing and troubleshooting,
 - Operation and maintenance procedures,
 - The building design and construction processes,
 - Automated control systems and control logic.
4. For each project, the commissioning purpose and scope are clearly defined in the CxP contract.
5. The CxP recommends the commissioning roles and scope for all members of the design and construction teams be clearly defined in:
 - Each design consultant's contract,
 - The construction manager's contract,
 - General Conditions of the Specifications,
 - Each division of the specifications covering work to be commissioned, and
 - The specifications for each system and component for which the suppliers' support is required.
6. Each project is commissioned in accordance with a written commissioning plan that is updated as the project progresses. The commissioning plan:
 - Identifies the systems to be commissioned,
 - Defines the scope of the commissioning process,
 - Defines commissioning roles and lines of communications for each member of the project team, and
 - Estimates the commissioning schedule.

⁵The term Commissioning Provider (CxP) is used in this document. Different terms, such as Commissioning Agent, Authority, Manager, etc., may be used in other documents and by other organizations.

7. On new building commissioning projects, the CxP reviews systems installation for commissioning related issues throughout the construction period.
8. All commissioning activities and findings are documented as they occur. Issues are tracked through resolution and acceptance. These reports are distributed as they are generated and included in the final report.
9. The functional testing program objectively verifies that the building systems within the commissioning scope of work perform interactively in accordance with the Project Documents. Written, repeatable test procedures, prepared specifically for each project, are used to functionally test components and systems in all modes of operating conditions⁶. These tests are documented to clearly describe the individual systematic test procedures, the expected systems response or acceptance criteria for each procedure, the actual response or findings, and any pertinent discussion.
10. The commissioning authority provides constructive input for the resolution of system deficiencies.
11. Every commissioning project is documented with a commissioning report that includes:
 - An executive summary including an overview of the implemented commissioning process, the systems commissioned, the major findings and the operating condition of the systems at the completion of functional testing,
 - Issues that were discovered and the measures taken to correct them,
 - Unresolved operational issues that were accepted by the owner, along with related recommendations,
 - Operational and ongoing commissioning recommendations⁷ based on information discovered during commissioning,
 - Functional test procedures and results,
 - Reports that document all commissioning field activities as they progress, and
 - A description and estimated schedule of required deferred testing

⁶ Often called functional tests, performance tests, or functional performance test procedures (FPTs), these tests are traditionally focused on confirming that systems function or perform in accordance with clearly defined acceptance criteria, while documenting sufficient data to clearly document a baseline of operation. For more complex or experimental systems, they may also be designed for fine tuning and to establish what the baseline of operation should be.

⁷ By the 2nd decade of the 21st century, 2 decades after the Essential Attributes of Building Commissioning were originally adopted, it has become clear that many commissioning stakeholders find tremendous value in using commissioning to facilitate the efficacy of turning over new systems from the installing contractors to the building operating staff. As 2020 approaches it is becoming more common for owners to request services such as training by the CxP on information discovered during commissioning and confirming as a part of the commission process that critical operating resources and documentation are provided as a condition of project completion. While this might not be essential for the effective commissioning of all projects it is recommended as good practice for many projects.