GUIDELINE

ASHRAE Guideline 0.2-2015

Commissioning Process for Existing Systems and Assemblies

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Includes real-world examples that illustrate application of the Cx Process to various facility, system, or assembly types. Requires Microsoft Word®.

SPECIAL NOTE

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ASHRAE Guidelines are prepared by Project Committees appointed specifically for the purpose of writing Guidelines. The Project Committee Chair and Vice-Chair must be members of ASHRAE; while other committee members may or may not be ASHRAE members, all must be technically qualified in the subject area of the Guideline.

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The Senior Manager of Standards of ASHRAE should be contacted for

a. interpretation of the contents of this Guideline,
b. participation in the next review of the Guideline,
c. offering constructive criticism for improving the Guideline, or
d. permission to reprint portions of the Guideline.

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NOTE

Approved addenda, errata, or interpretations for this guideline can be downloaded free of charge from the ASHRAE Web site at www.ashrae.org/technology.

(This foreword is not part of this guideline. It is merely informative and does not contain requirements necessary for conformance to the guideline.)

FOREWORD

The Commissioning (Cx) Process for existing systems and assemblies is an organized, quality-oriented process for planning, assessing, investigating, implementing, verifying, and documenting that improves the performance of facilities, systems, and assemblies to meet defined operational requirements and criteria for the facility over time.

The Existing-Building Commissioning Process

The Existing-Building Commissioning (EBCx) Process is used by Owners and/or other facility decision makers to optimize the operation of their facilities and systems for their specific Current Facility Requirements (CFR). The process is used to plan facility operation programs and goals and then compare existing conditions and operations to those goals. This evaluation allows the Owner to determine if any of the existing conditions require or warrant further attention. The process is also used to identify the causes of existing problems and shortfalls in achieving the CFR and to determine methods for resolving those problems. Most importantly, the process provides the Owner with a logical decision-making approach to evaluate, compare, prioritize, and implement recommendations for making their facilities operate as efficiently and effectively as is economically feasible given the Owner's specific requirements and resources. When physical changes to the facility are required as a consequence of the EBCx Process, all such modifications must meet applicable codes pertaining to the work being performed. Additionally, following the process allows Owners to maintain the benefits of these implemented recommendations over time.

The EBCx Process differs from the Cx Process for new buildings in that the Cx Team for existing buildings is selected and charged with evaluating existing-building systems and assemblies to determine their ability to meet the Owner's CFR, which may differ from the original design.

This guideline details a process that can be applied to any type of building, system, or assembly. The EBCx Process consists of distinct phases with specific objectives to be achieved during each phase in order to identify and correct operational and functional issues that prevent the building systems and assemblies from performing as currently required. The process involves the following phases: Planning, Assessment, Investigation, Implementation, Hand-Off, and Ongoing Commissioning (OCx). This guideline describes the responsibilities of the Cx Team and the documents and reports needed to provide a uniform, integrated, and consistent approach for maintaining, operating, and managing assets to meet the Owner's and other stakeholders' ongoing requirements.

The process detailed in this guideline is presented as linear. In reality, the process probably will be iterative and interactive, where many tasks and even some phases are performed more than once as needed for the specific facility and systems. The documents used and created in this guideline are living documents that will need to be updated throughout the EBCx Process.

The process places an emphasis on planning and on documentation of the CFR early on, with updates throughout as needed. Owners adopt the EBCx to achieve their stated objectives and criteria as defined in the CFR. The CFR must appropriately describe these criteria as understood at the beginning of the process and must be modified as new information is uncovered.

The Assessment, Investigation, and Implementation Phases are critical to making a difference in a facility, but the most overlooked phase is the OCx Phase, which is used for verifying and sustaining the actual performance of the facility over time. If the Owner does not continue to verify system performance improvements, those benefits are likely to deteriorate or disappear in future years. The development of facility staff training modules, including documents on how the building works (facility guide), are critical to maintaining long term performance in anticipation of the inevitable staff turn-over.

The Cx Process as presented herein allows the Owner to reduce the life-cycle cost of the facility. Following this integrated process should result in a fully functional facility, with complete documentation of its systems and assemblies, and trained operating and maintenance personnel.

EBCx Process Supporting Technical Guidelines

ASHRAE Guideline 0.2 presents details on the Cx Process for existing systems and assemblies without focusing on specific systems or assemblies. Supporting technical guidelines are being developed to provide specific and detailed information on how to implement the Cx Process for each major facility system or assembly. However, the EBCx can be implemented successfully without the supporting technical guidelines.

Supporting technical guidelines use a common content organization that is closely coordinated with Guideline 0.2 to avoid repeating Cx Process information that is conveyed in this guideline. This common content organization, with focus on system-specific information, forms a set of documents that can be employed together or in any combination to accommodate varying Owner requirements.

Annexes

Annexes are included with this guideline to assist users in applying the Cx Process for existing systems and assemblies and to aid in the development of the supporting technical guidelines. Most of the annexes include examples located online at ***www.ashrae.org/G02-2015****. The examples are based on specific project experience and are presented as a representative sample of current practice, which may not follow all of the procedures presented in this guideline. They illustrate application of the Cx Process to various facility, system, or assembly types. They are not intended to promote specific formats for the various deliverables related to the Cx Process but to help illustrate how the guideline can be put into practice.*

History of Cx Process Guidelines

Development of guidelines for the Cx Process began formally in 1982 when ASHRAE formed a committee to document best practices to achieve facilities that performed according to the needs of the Owner and other stakeholders. ASHRAE published

its original Cx guideline, ASHRAE Guideline 1, The HVAC Commissioning Process*, in 1989, and an updated version was published in 1996. These first guidelines were developed with an emphasis on HVAC&R equipment.*

In 1999, it was decided to develop a more inclusive set of guidelines that applied to all building systems. This effort resulted in a collaboration with the National Institute of Building Sciences (NIBS) and the concept of a general guideline for the Cx Process and a series of supporting technical requirements guidelines for different building systems. In 2005, ASHRAE published Guideline 0, The Commissioning Process*, to address the underlying quality-based Cx Process without reference to a specific system type. NIBS subsequently published the first supporting technical guideline, Guideline 3,* Exterior Enclosure Technical Requirements for the Commissioning Process, in 1996*. Shortly thereafter, ASHRAE replaced Guideline 1-1996, which had contained both general Cx Process requirements and HVAC technical requirements, with supporting technical guideline, ASHRAE Guideline 1.1-2007,* HVAC&R Technical Requirements for the Commissioning Process*.*

On completion of ASHRAE Guideline 0-2013, it was determined that unique requirements existed in the Cx Process for existing buildings that warranted a separate guideline to detail the EBCx, along with supporting technical requirements guidelines for different building systems. This resulted in both ASHRAE Guideline 0.2, The Commissioning Process for Existing Systems and Assemblies*, as well as an expansion of the commissioning guideline series.*

1. PURPOSE

1.1 The purpose of this guideline is to describe the procedures, methods, documentation, requirements, and physical activities of the Commissioning (Cx) Process for existing buildings, systems, and assemblies using the principles developed in ASHRAE Guideline 0, *The Commissioning Process*.

2. SCOPE

2.1 This guideline applies to existing buildings, systems, and assemblies.

3. 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.

commissioning (Cx): see *Commissioning (Cx) Process*.

Commissioning Authority (CxA): an entity identified by the Owner who leads, plans, schedules, and coordinates the Cx Team to implement the Cx Process.

Commissioning (Cx) Plan: a document that outlines the organization, goals, schedule, allocation of resources, and documentation requirements of the Cx Process.

Commissioning (Cx) Process: a quality-focused process for enhancing the delivery of a project. The process focuses on verifying and documenting that the facility and all of its systems and assemblies are planned, designed, installed, tested, operated, and maintained to meet the Owner's Project Requirements (OPR).

Commissioning (Cx) Process Activities: components of the Cx Process.

Commissioning (Cx) Process Progress Report: a written document that details activities completed as part of the Cx Process and significant findings from those activities. The report is continuously updated during the course of a project and usually incorporated into the Cx Plan as an ongoing annex.

Commissioning (Cx) Team: individuals who through coordinated actions are responsible for implementing the Cx Process.

Current Facility Requirements (CFR): a written document in which the Owner details the current functional requirements of a facility and the expectations of how it should be used and operated. This may include goals, measurable performance criteria, cost considerations, benchmarks, success criteria, and supporting information to meet the requirements of occupants, users, and Owner(s) of the facility.

Existing-Building Commissioning (EBCx) Process: a quality-focused process for attaining the CFR of an existing building and/or its systems and assemblies. The process focuses on planning, investigating, implementing, verifying, and documenting that the facility and/or its systems and assemblies are operated and maintained to meet the CFR, with a program in place to maintain the enhancements for the remaining life of the facility.

facility guide (FG): a basic building systems description and operating plan with general procedures and confirmed facility operating conditions, setpoints, schedules, and operating procedures to properly operate the facility.

functional performance test protocol: a written collection of tests that, when executed in the test process, allow verification of the performance of a system or assembly.

issues and resolution log: a formal and ongoing record of problems or concerns and their resolution that have been raised by members of the Cx Team during the course of the Cx Process.

Measurement and Verification (M&V) Plan: a plan for gathering relevant data over time to evaluate performance and benefits.

Multiple-Facility Program Plan: a strategic plan for enhancing multiple facilities.

Ongoing Commissioning (OCx) Process: a continuation of the Cx Process after the Hand-Off Phase to verify that a facility continues to meet current and evolving CFR (OPR for new construction). OCx Process Activities occur throughout the life of the facility; some of these will be close to continuous in implementation and others will be either scheduled or unscheduled (as needed).

recommissioning: an application of the Cx Process requirements to a project that has been delivered using the Cx Process (see *Existing-Building Commissioning [EBCx] Process*).