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Commissioning Existing Buildings (EBCx)

New guidelines are on the way.

By Terry Rodgers
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Formal commissioning is now an accepted practice and included in almost all new data center construction projects. The commissioning process has been described in various documents with perhaps the most definitive and authoritative being ASHRAE Guideline 0 "The Commissioning Process."

With owners and developers now recognizing the value of employing formal commissioning to new construction, they are looking to apply these same processes to existing facilities. The industry has coined the terms "retrocommissioning" for commissioning existing facilities that were not commissioned when constructed and "recommissioning" when applied following significant modifications, upgrades, or expansions to previously commissioned sites.

Is it reasonable to expect the same processes included in commissioning new construction projects to work equally well when commissioning existing facilities? The broad consensus is no, and that's why ASHRAE is developing a new guideline for the commissioning of existing facilities. This document will be called ASHRAE Guideline 0.2 "The Commissioning Process for Existing Building Systems and Assemblies."

The Existing Building Commissioning Process (EBCxP) is fundamentally different from new construction commissioning. With EBCx, the commissioning team is tasked with assessing existing building systems and conditions and comparing them and their capabilities to satisfy the owner's current needs and requirements, which can differ from the original design.

ASHRAE embarked on developing commissioning guidelines in 1982 when it formed a committee to establish "best practices to achieve facilities that performed according to the needs of the owner and other stakeholders." This effort culminated in 1989 with the first ASHRAE commissioning guideline. This guideline had an emphasis on heating, ventilation, air conditioning, and refrigeration (HVACR) equipment and was called Guideline 1-1989 (note that ASHRAE routinely includes the year of publication after each guideline's number). This guideline was subsequently updated and issued as Guideline 1-1996.

In 1999, ASHRAE and the National Institute of Building Sciences (NIBS) collaborated in developing a more general and inclusive guideline that applied the commissioning process to all building systems. ASHRAE completed this effort and published Guideline 0-2005. NIBS followed by

publishing its guideline 3-2006 "Exterior Enclosure Technical Requirements for the Commissioning Process" and ASHRAE replaced Guideline 1-1996 with Guideline 1.1-2007 "HVAC&R Technical Requirements for the Commissioning Process. Whereas the original Guideline 1-1989 and subsequent 1-1996 tried to cover both the general commissioning process and specific technical requirements for HVACR, the new guidelines 0-2005 and 1.1-2007 separated these into two distinct documents. Guideline 0 is a standalone document that defines the commissioning process in terms that can be applied to any building system, assembly, component, etc. Guideline 1.1 is best viewed as a supplement to Guideline 0 that provides direction on applying the general commissioning process to HVACR (which is the traditional realm of ASHRAE).

Soon after completing Guideline 0-2005, ASHRAE recognized that there are inherent differences between commissioning existing facilities vs. commissioning new buildings. Some obvious examples being that the owner's project requirements and original basis-of-design criteria may no longer apply to existing buildings that have been modified, renovated, and even totally repurposed for missions completely different from when originally constructed. This is, of course, especially true for instances where mission critical operations and supporting infrastructure are moved into existing buildings and facilities that were originally constructed as office buildings, warehouses, and other non-critical sites.

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The new ASHRAE Guideline 0.2, "The Commissioning Process for Existing Building Systems and Assemblies," modifies the commissioning process for new construction to apply to existing facilities. The expectation is this new guideline will be followed by a supplemental guideline for applying the general commissioning process to existing HVACR systems probably called ASHRAE Guideline 1.2 "The HVACR Technical Requirements for the Existing Building Commissioning Process."

NEW GUIDELINES AND GUIDANCE

Guideline 0.2 will introduce some new terms and abbreviations specific to commissioning existing buildings. The more important new terms are existing building commissioning process (EBCxP) and current facility requirements (CFR). EBCx is the process where owners and other facility decision-makers formalize the current functional requirements of the facility and expectations on how it will be used and operated in the CFR document, and then compare existing conditions and operations to meet the new goals and objectives in the CFR. This comparison reveals conditions that warrant further investigation or attention and then identifies existing problems in meeting the CFR and methods of resolving these problems.

EBCx provides guidance on how owners can evaluate, prioritize, and implement the resulting recommendations to optimize the facility's performance and meet the CFR requirements. EBCx also describes the associated documentation and deliverables that result from the EBCx process, including an EBCx report, systems manual, facility guide, and training plan.

The EBCx process also considers that many sites consist of multiple buildings and facilities. It provides a methodology for establishing goals and expectations for each of the facilities, prioritizing

and structuring the commissioning process across the portfolio, and deciding the appropriate order/sequence for proceeding with the process. This aspect is captured in a document called the existing building commissioning program plan and can also be applied to a single facility that is to be commissioned in phases.

The EBCx process consists of distinct phases each with specific objectives. The phases are presented sequentially but the guideline explains that some phases may be iterative and can at times proceed concurrently with others. The major phases are:

- Multiple facility planning
- Assessment
- Investigation
- Implementation
- Hand-off
- Ongoing commissioning

As with Guideline 0, Guideline 0.2 will include many examples, sample documents, and informative narratives to assist users in following the guideline in the form of annexes. These annexes will include an EBCx process flowchart, documentation matrix, and a sample RFQ for EBCx team selection. There will be a sample EBCx report, EBCx program plan (for multiple facilities), and CFR. Also included will be a sample assessment report, investigation report, implementation report, measurement and verification (M&V) report, and ongoing commissioning report, as well as a sample training plan, systems manual, and facility guide.

ASHRAE commissioning guidelines have provided clear direction and best practices for commissioning buildings and facilities. The critical facility industry has embraced these processes and as a result has seen a steady improvement in the quality of design and construction of these facilities. Considering how most critical facilities evolve over time and undergo various upgrades, modifications, technology refreshes, and expansions, the new guidelines for commissioning existing buildings may provide even better guidance for using formal commissioning to ensure owners' investments in their existing buildings and infrastructure result in meeting their short and long term goals and objectives.

Terry L. Rodgers, CPE, CPMP, is vice president, Sustainable Operations Services at Primary Integration Solutions, Inc., the Charlotte-based commissioning business of Primary Integration (PI). He has over 25 years of progressive experience in critical facilities operations and management, including strategic planning; critical infrastructure design, management, operations, and commissioning; business protection and recovery; preventive and predictive maintenance; technical training; and professional training development.