

# LEED®: Opportunities and Challenges for the Commissioning Industry

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## Synopsis

The LEED® building certification program has greatly increased the awareness of building commissioning among architects and building owners. The requirement that each LEED certified building must be commissioned has produced a welcome upsurge in demand for commissioning services while at the same time posing challenges for the commissioning industry.

The commissioning process required for LEED generally follows the procedure and process of the ASHRAE Guideline, however there is evidence that the perceived added cost of commissioning to a building project is creating pressure to lower costs in ways that may affect the quality of services. The author has participated in LEED projects as a commissioning provider and as a LEED reviewer for the USGBC for dozens of project submissions. From this perspective, the following issues are illustrated and discussed:

1. The commissioning prerequisite is often perceived by the design team as series of hoops to jump through rather than a valuable service. Cost becomes the main driver of procurement of services and owners may be left with the same problems that building commissioning was designed to avoid.
2. It is fairly easy to produce a LEED submission that meets the commissioning prerequisite largely composed of paperwork with little value to the building owner.
3. The profit potential of offering building commissioning is recognized by a wide variety of professions including test and balance firms, architects, mechanical contractors and mechanical designers. There is no consensus on minimum qualifications and LEED is creating exceptions to the requirement for independent third party providers.

## About the Author

Janice Peterson is a registered mechanical engineer with over 20 years experience in energy efficiency and building performance. She is currently the manager of building operations for the Northwest Energy Efficiency Alliance based in Portland, Oregon. While at Portland General Electric she conceived and managed the successful existing building commissioning program, the first in the nation. She is active on several ASHRAE technical committees and is the past chair of TC7.9 Building Commissioning. Her experience includes being both a consumer and a provider of commissioning services as well as serving as a reviewer of numerous LEED certification projects.

## Introduction

The popularity of LEED NC has resulted in many building owners procuring commissioning services for the first time. The demand for services has in turn led to a rapid growth in the number of commissioning providers. Inexperience with the process on both sides may sometimes lead to the perception that commissioning is an expensive paperwork exercise. This is an important time for those of us in the commissioning industry to examine and reaffirm core commissioning attributes to maintain the value of this quality based process.

## Background

Building commissioning was well established before LEED. Although not quite business-as-usual, commissioning had already become common practice for state, federal and educational facilities. A growing number of private owners were also recognizing the value of commissioning and were including it in their project requirements simply because it met a need to ensure higher quality in their building projects. The inclusion of fundamental commissioning as a prerequisite under the LEED rating system was further validation that building commissioning had proven its worth in the new construction marketplace.

The decision to build a 'green' building is made for a variety of reasons including: a desire to minimize impact on the environment, a belief that it will be a healthier place to live and work, a mandate from a governing authority, or as an added feature that will help attract higher rents or sale prices. With the advent of LEED, the demand for commissioning services has far exceeded the availability of experienced providers. LEED now has well over 3,000 projects registered and is experiencing exponential growth. Many cities and states give tax breaks and other incentives if a building is certified. In Oregon the popular Business Energy Tax Credit is tied to LEED certification and requires the achievement of the additional commissioning credit. The City of Portland G/Rated program and the Portland Development Commission also have inducements for LEED certification.

## Issues

### ***Who is a Qualified Cx Provider?***

To meet this demand commissioning is now being offered by some traditional mechanical design firms, test and balance companies, mechanical contractors and service providers, architects and construction companies. At the same time, there are now at least five certification programs for commissioning providers, each with their own training and quite a wide range of qualification requirements. Table 1 compares some aspects of the most widely available certifications for commissioning providers; some require years of experience; others require only an exam and a hefty fee.

**Table 1: Comparison of Professional Certification Requirements <sup>1</sup>**

Organization	Number Of Levels	Minimum Experience	Exam	Fee	Oversight	Comment
ACG AABC Commissioning Group	1, Certified Commissioning Authority (CxA)	3 commissioning projects, Must be Registered Architect, Professional Engineer or certified Test and Balance Engineer (TBE)	YES	\$250 + \$1,500/yr	Quality Assurance Program	Stress Independence
AEE Association of Energy Engineers	1, Certified Building CX Professional (CBCP)	Combination of education and experience in a variety of fields, or be a Certified Energy Manager (CEM)	YES	\$200 + \$200 every 3 years	None listed	Continuing education is required for renewal
BCA Building Commissioning Association	1, CCP Certified Commissioning Professional	4 year building science related degree and 3 years project experience or equivalent	YES	\$500 including exam	Formal peer review process	Organization established by practicing Cx professionals
NEBB National Environmental Balancing Bureau	Certified by building system, currently 3	Must meet qualifications as a NEBB firm and have an individual to supervise with a combination of education and experience	YES	Varies, up to \$2,000 to initiate + a yrly fee	Annual exam	Oriented toward contractors
University of Wisconsin	4 levels	Varies by level. Some experience and work samples required for top levels.	YES	\$375	Recertify every 5 yrs	Administered by Department of Engineering Professional Development.

1. Information gathered from organization websites.

The LEED for New Construction Version 2.2 now requires that the commissioning provider have documented experience in at least two building projects. At this time, few RFPs are written giving preference to a professional certification, however many expect that this will eventually be the case. There has been a great deal of discussion over the years as to what the minimum qualifications should be, but there is no real consensus and the discussion is far from over.

### ***Is Independence Still an Issue?***

Yes.

One of the most basic principles of commissioning has been that the provider should be an independent third party, responsible directly to the owner. The reasoning is fairly obvious, because the commissioning provider needs to have only the owner's best interest as the first priority. If the commissioning provider is paid by, or reports to, anyone else a conflict of interest is inevitable, despite best intentions.

The Building Commissioning Association expresses it this way in the Essential Attributes of Building Commissioning:

*The Commissioning Authority (CA) is an objective, independent advocate of the owner who leads, plans, schedules and coordinates the commissioning team. If the CA's firm has other project responsibilities, or is not under direct contract to the owner, a conflict of interest exists. Wherever this occurs, the CA discloses, in writing, the nature of the conflict and the means by which the conflict shall be managed. (1)*

Under the heading of Desired Qualifications in Annex E of ASHRAE Guideline 0 it is suggested that:

*The Commissioning Authority will be an independent contractor and not an employee or subcontractor of the General Contractor or any other subcontractor on this project, including the design professionals. (2)*

The LEED NC 2.1 Requirements for Fundamental Commissioning is a bit more lenient in allowing individuals to be employed by the design firm, but still maintains some independence:

*Engage a commissioning team that does not include individuals directly responsible for project design or construction management. (3)*

Recently LEED NC has been revised in Version 2.2 to further soften the requirement for independence. It now includes the following:

*For projects smaller than 50,000 gross square feet, the CxA may include qualified persons on the design or construction teams who have the required experience. (4)*

This change was made despite objections from many prominent providers, membership of ASHRAE Technical Committee 7.9 Building Commissioning, and even some members of the LEED technical advisory group. The reason for the change is reportedly primarily economic. Some owners were complaining, citing the cost of commissioning as a barrier to use LEED. At the same time designers, contractors and other project members are offering commissioning as a lower cost add-on service. This is the only LEED credit that makes an exception for building size. The LEED rating system is influenced by a wide array of professionals and is approved as a whole rather than by parts. Members may have objections to certain changes, but are forced to make a decision on whether to vote against the whole document because of objections to a small portion.

While most project members sincerely want to do a quality job, economic considerations can influence good judgment. A member of the A/E firm is not immune from internal pressure just because they are in a separate department. A consultant hired by an architect or a design-build team will know that their next job is more likely to come from the immediate employer than from the owner. An individual who is actually part of a design team or works for a contractor is even more conflicted. It is possible for the relationship to succeed, but the reality of job dynamics will work against it.

### ***Is Commissioning Becoming Prescriptive?***

More experienced providers have developed their own approaches to building commissioning. The professionals who came together to create the Building Commissioning Association recognized this and focused on critical attributes and components rather than a prescriptive process.

There is a perception by some in the industry that while LEED has created a pleasant upsurge in demand for services, building commissioning is now coming under the same type of fee pressure that helped create the need for this service to begin with. Many building owners who want LEED certification for one reason or another, have little or no experience with commissioning and see it as a hurdle that they would like to get past with the least possible expense. It is entirely possible to meet the LEED prerequisite by a largely paperwork effort and reviewers are looking for compliance with prescriptive requirements rather than judging quality.

Figure 1 shows some examples of this with some pages drawn from a commissioning report. On the left is part of a filled out checklist. The checklist itself has been obtained from a credible source, but has not been customized for the project and has obviously been filled out in haste. On the right is the same checklist submitted a month later after the commissioning provider asked for it to be completed. Although there are more checks on the list, it doesn't give much confidence in the process. The commissioning specifications for this same project, which is about 125,000 sq. ft. with a complex HVAC system, comprise about half a page. Both documents technically meet the requirements to use checklists and include commissioning in the specifications, but their usefulness to the project is in question. The commissioning plan is another element of the LEED submissions that many times seems perfunctory. This level of effort does not represent the majority of projects, but is common enough to be of concern.

There is nothing wrong with using forms that others have created. It is a great time saver and there are many excellent examples to use as a model. It is no wonder that an inexperienced person would go to such a source, however it is only fair to the person filling out a checklist that it be tailored for the specific project and should augment the start-up sheet rather than duplicate it. Likewise, there is no point in having a commissioning plan that is not used. The popular templates include a nice explanation of the general commissioning process but needs project specific detail to be useful.

The image shows two identical copies of an 'AHU PREFUNCTIONAL CHECKLIST'. Each checklist is a table with the following columns: 'Check', 'Equip Tag', 'AHU-1', 'AHU-2', 'AHU-3', and 'Comments'. The 'Check' column lists various items such as 'Filters installed and replacement type and efficiency permanently affixed to housing', 'Ductwork installed and sealed', 'Pipes properly labeled', 'Valves installed in proper direction', 'CSAT, SAT, SMT, SMT, chilled water supply sensors properly located and secure', 'Smoke and fire dampers installed properly', and 'Ducts (preliminary check)'. The 'Equip Tag' and 'AHU' columns contain checkmarks (✓) or initials (M.C., C.C., N.C.). The 'Comments' column contains handwritten notes or initials. At the bottom of each checklist, there is a 'Notes:' section and a footer with the file name 'File: PC1\_AHU.doc' and the title 'Commissioning Guide Specification - (PC1) 5/16/2005'.

Figure1: Prefunctional Checklist for Three Large Air Handlers

## Conclusions

Thanks to LEED, building commissioning has been given a big boost to its goal of becoming “business as usual.” The growth in the industry is welcome but presents some challenges:

- Because of the profit potential, building commissioning is being offered as an add-on service in project proposals by a number of design professionals, design/build firms, contractors and others.

- The traditional independence of the commissioning provider from the other members of the design team and contractors is threatened.
- New professionals to the field may put too much reliance on widely available tools.

Some take the view that any commissioning is better than none. This might be true, but inevitably the reputation of the industry will suffer. We need to be even more active in educating owners in what to expect from a commissioning project and increase our participation in the further development of a profession recognized as a valuable and proven contributor to building performance.

## References

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