BCA™ Building Commissioning Association

The Checklist

2010 Fourth Quarter

The quarterly newsletter of the Building Commissioning Association

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In This Issue

Letter from the President

BCA Members,

I've been honored to have been your President of the International Board of Directors for the past three years. It has given me opportunities to do many things: visit our regional chapter events, participate on committees with organizations such as USGBC and NIBS and meet many of our members on a one-to-one basis. It has also given me opportunities to travel not only the country, but the world, i.e. Hong Kong, to help spread the word for commissioning. During my two terms on the board, the association has grown from around 500 members to over 1,200. We've grown from six chapters to seven, with three more working to achieve permanent chapter status.

I am forever grateful for the opportunity that I was given by the board and by our members to serve the BCA. The board members have been very supportive and cooperative in helping to grow the association.

Over the last three years, our association has grown from approximately 500 to over 1,200 members.

While we have a great deal of work yet to do, we have gone a great distance in the last few years. The BCA is now recognized as a force in the commissioning world. We are working with several other industry players—ASHRAE, AIA, NEBB and others—to bring standardization to the industry. Our mission and vision are being successfully communicated across the green building industry, and people are paying attention.

Because of this, we are becoming a key player in the formulation of a training initiative to be delivered across our great country. Be sure to check out this edition of The Checklist for updates.

Members of our Board of Directors are behind each other and fully committed to the advancement of the commissioning industry. As I complete my term of service, I am very confident that I am leaving a strong board that will continue to grow the association. I thank each and every one of you for your support over the last few years and ask that you continue to do good work.

Sincerely,

Ed Faircloth

Ed Faircloth, LEED AP
BCA President

Volunteers engage visitors

Michael Cheledink and John Villani

International Interest Shown at Greenbuild 2010

By Catherine Craglow

International commissioning was the hot topic at this year's Greenbuild tradeshow. The BCA talked to more international attendees than ever before, including those from Mexico and countries in South America and the United Arab Emirates.

More than 25,000 people converged on Chicago for the Nov. 17 to 19 event. Greenbuild is the world's largest conference and expo dedicated to green building, and is presented by the U.S. Green Building Council.

The green building industry was well represented, with attendees from 122 countries, and the BCA was well represented by its members and trade show booth. Communicating the BCA's purpose of education and outreach was the primary focus of BCA member volunteers as they talked with hundreds of visitors.

General Colin Powell (ret.), the convention's opening speaker, said that leaders must "be passionate" and "believe they have a purpose."

Many of the owners, architects and project managers who stopped by the BCA booth had heard of commissioning, but didn't fully understand the process or how to find a qualified commissioning provider. But after talking with members and previewing the corporate provider directory and the documents and templates offered on the BCA website, they left the booth armed with information and a new appreciation for the energy savings realized by the commissioning process.

There is a clear interest and need for commissioning in other parts of the world, and the BCA is taking steps to provide education, training and other membership benefits to its international contingent. The timing couldn't be better: the first international Greenbuild takes place in Toronto, Canada, in Oct. 2011.

Special thanks go out to Central Chapter members Dave Guberud and John Villani and to International Board members Michael Chelednik and Ed Faircloth for their time and participation at this successful event. ■

Greenbuild 2010

Defining Commissioning Authority and Energy Auditor Job Requirements

By Travis Purser

In its partnership with PECI to develop commissioning and auditing training, the BCA is already helping solve one of the biggest challenges: Before training developers can decide where to focus their efforts, they need to determine what the job requirements are for commissioning and auditing. Yet, no industry standard exists that defines these occupations.

To fill this gap, PECI turned to a team of BCA commissioning experts. During two workshops held in November, the team identified the knowledge, skills and abilities, known as KSAs, required to perform their jobs completely.

The entire BCA membership was then surveyed to rank the KSAs by importance. The rankings will guide the selection of topics for instruction.

A similar process is under way to define and rank KSAs for auditors.

"I thought it was a great start on getting some technical training developed for commissioning providers," said Karl Stum, one of the CxAs who participated in the workshops. "I thought it was excellent involving stakeholders and practitioners. I think that's essential to help ensure the outcome is practical and useful and sustainable."

This approach to curriculum development is known as the Systematic Curriculum and Instructional Development process, a standard in the training and development industry. The SCID process identifies job tasks necessary for developing competency-based training. It has a reputation as a high-quality, low-cost method that is especially suitable for technical curricula.

Experts identified 100 KSAs during the workshops. Some of the highest ranking items in the subsequent survey were technical in nature: knowledge of direct digital control systems, the ability to determine testing requirements of specific systems and equipment and the ability to facilitate functional performance testing.

Training developers anticipate that additional topics will include fundamentals of mechanical and electrical systems; commissioning processes; testing and conducting diagnostics of energy using systems; estimating energy savings and project costs; and verifying and monitoring system performance to ensure energy performance goals are reached and benefits persist. ■

CCP™ Updates

The BCA congratulates the following individuals on achieving the Certified Commissioning Professional (CCP) designation:

Glenn Cattell, CCP, LEED AP
Horizon Engineering Associates, LLP
Tipton, MI

Donald Posson, PE, CCP
Vanderweil Engineers
Alexandria, VA

Timothy Whitley, PE, CCP, LEED AP
Reynolds, Smith and Hills, Inc.
Jacksonville, FL

They join the ranks of some of the most qualified commissioning providers in the industry. Way to go!

The CCP exam is online and available at more than 200 testing sites. To apply, review the Candidate Bulletin and download the application at **www.bcxa.org/certification**.

Not sure if you are qualified? Send us your questions at **certification@bcxa.org** or call the BCA Hotline at (877) 666-2292. ■

BCA, PECI Partnering in $1.5 Million Training Program

by Travis Purser

The BCA is partnering with PECI to develop a $1.5 million energy-focused technical training program to address the high demand for commissioning and auditing services in the commercial buildings market.

With funding from the Department of Energy's National Energy Technology Laboratory and six other organizations, the program will deliver hands-on training to teach experienced professionals introductory and advanced skills for optimizing the performance of new and existing buildings.

Since receiving a $750,000 grant from the DOE in July, the program has moved into the curriculum development stage. As key players, BCA members are participating on a committee of experts to define what CxAs and auditors should know and be able to do. This work will guide the development of training goals and determine curriculum topics. The New Jersey Institute of Technology is working with PECI to develop e-learning training components, and several community colleges will provide laboratory space for hands-on training. Rollout is scheduled for late 2011.

"The BCA is the frontrunner in recognizing the standards in our industry," said BCA President Ed Faircloth. "We can ensure that the information and the training are in tune with today's requirements from the owner, and make sure the right requirements are used so that they meet or exceed what owners ask for. The owner's intent is what we're driving for."

In addition to providing in-kind contributions, the BCA has pledged to endorse and promote the program. Possible alignment with BCA's Certified Commissioning Provider credential is also an option, although no decisions about such an alignment have been made. Decision makers hope that linking the training to the CCP would raise professional standards for the commissioning industry and support the BCA credential as the leading certification for CxAs.

Other contributors to the project include the New York State Energy Research and Development Authority, California Energy Commission, Northwest Energy Efficiency Alliance and California Commissioning Collaborative. ■

Renew your BCA Membership in December

Don't risk missing out on any part of 2011—the BCA has an interactive website in the works, an expanded list of webinar offerings and three new chapters. A renewal invoice has been sent, but you can renew quickly and easily online at **www.bcxa.org/members**. All you need is your member number and password. Or call the hotline at (877) 666-BCXA (2292) and we'll be happy to assist you.

Functional Testing in EBCx

AN OVERVIEW OF BEST PRACTICES AND AVAILABLE RESOURCES

By Erik Greensfelder and Mark Effinger

Many utility-based existing building commissioning (EBCx) programs require a significant level of documentation to demonstrate an issue and its implemented resolution. Functional performance testing can help commissioning providers meet this requirement. Many of the principles of functional testing also apply to other types of building commissioning.

WHAT IS FUNCTIONAL TESTING?

A functional performance test (FPT) is a process for verifying that specific components, equipment, systems and interfaces between systems conform to given criteria. The FTP is a tool that building operators or commissioning providers can use to verify system performance and identify both system faults and inefficient operation.

THE ROLE OF FUNCTIONAL TESTING IN UTILITY PROGRAMS

Trend data from portable data loggers or the building automation system (BAS) is generally preferred, but not always possible to collect. Trend data may not be available, data may not have been collected at a critical point, or the test conditions may not have naturally occurred during the monitoring period. In these cases, a functional test can verify equipment performance under specific conditions and act as the primary form of documentation. Proper documentation is a critical aspect of a utility-based incentive program, especially when the program is supported with public funds.

The stringent documentation requirements in utility-based programs are typically due to the highly regulatory environment in which most utilities operate. Utility EBCx projects may undergo many levels of review and evaluation from individuals who are not familiar with the building or its systems. Some of these reviews can take place years after the project is completed, and energy savings claimed by the utility may be de-rated if evaluators determine that the baseline or post-implementation conditions are not documented sufficiently. To ensure a smooth review process, the FPTs should be documented in a way that clearly indicates the process and results. For example, consider enhancing text-based test results with photos or screenshots to help reviewers visualize the process. If steps are taken during the EBCx project to ensure clear documentation, the odds that savings hold up to future evaluations should increase.

Documentation might not be as critical with owner-driven projects as in a utility-based EBCx program, but there are still benefits to providing quality documentation. Proper documentation helps the operators understand the functional testing process and any implications of the test results. Documentation can also help operators repeat the test in the future to continually verify that the system is performing as intended.

For consistency, consider documenting the test procedure and results using a predefined template.

OVERVIEW OF METHODS

Preparing for the FPT before the day of the test allows time for those involved to consider possible impacts and plan options for achieving beneficial results. FPT plans should focus on three areas: defining the purpose of the test, developing test procedures and developing documentation.

TOOLS & RESOURCES

PECI provides free **functional testing and design guides** with information on testing fundamentals and example forms. **Blank functional test forms** with instructions are also available.

The purpose of an FTP when used as a documentation source should be to clearly demonstrate that the project requirements have been met. The development of clear goals and intentions before the start of the test can help ensure the results demonstrate the actual intent of the test. Skipping this step can lead to ambiguity. For example, functional tests related to airside economizer control can test the dampers' ability to properly modulate, the system's response to the control sequence, or both. Testing the dampers for proper modulation only will not prove that the modulation occurs according to the sequence and will not prove the economizer sequence functions properly.

Typically, providers will need to discuss test procedures with the onsite staff most familiar with the building operations. This coordination can greatly increase productivity and help inform the provider of any precautions that should be addressed. Utilizing staff knowledge should help prevent undesired consequences resulting from the test, such as cycling critical equipment at inopportune times.

Coordinating test procedures with staff can also improve efficiency by allowing all parties to prepare, provide early feedback and identify procedures that might not be possible. Modifying a test before a site visit is typically easier than making changes during the test.

Before beginning the FPT, it is important to identify all of the systems that may be involved in the test. During the planning phase, information may be gathered about system characteristics from available building documentation, interviews with building operators and any available trend data. A walk-through may be conducted to identify systems and clues regarding systems operation. Potential issues can be identified by observing system dynamics through the BAS front end.

To successfully conduct a functional test, all team roles should be discussed and made clear in advance. The test team typically includes the EBCx provider and building operators, but may also include other specialists, such as controls contractors.

In some sensitive cases, such as hospitals or high-priority labs, it may be necessary to conduct and document a rehearsal test using the developed FPT form as a guide. The form should include clear step-by-step instructions along with predefined acceptance criteria. The FPT form should be revised based on the rehearsal results.

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TESTING METHODS USING BAS

The BAS can be an effective way to test operational sequences, especially when conditions necessary to naturally observe a sequence do not occur during the monitoring period. Some control systems have the capability to drive sensor inputs using a test mode. These driving inputs can be adjusted to test the desired sequence. For example, the outdoor air temperature input may be lowered in the BAS below the chiller enable temperature to ensure that the chillers shut off at low outside air temperatures. When using a BAS test mode, be wary of any global points that might impact other systems in the building. Inputs such as outside air temperature might be used by several pieces of unrelated equipment. When using the BAS to implement an FPT, screenshots are an excellent resource to enhance documentation.

If the BAS capabilities do not allow the override of the specific sensor inputs that drive a sequence, consider modifying the set points instead. For example, a reset strategy can be tested by shifting the modifiable set points around a non-modifiable (input) sensor value as shown in Figures 1 and 2. This strategy allows the test conductor to drive the sequence and verify the set point reaches the desired limits. Remember, it is important to track any changes made in the BAS so the initial settings can be restored. Otherwise, manual overrides put in place during the test could be accidentally left in the BAS and prevent the system from operating as desired.

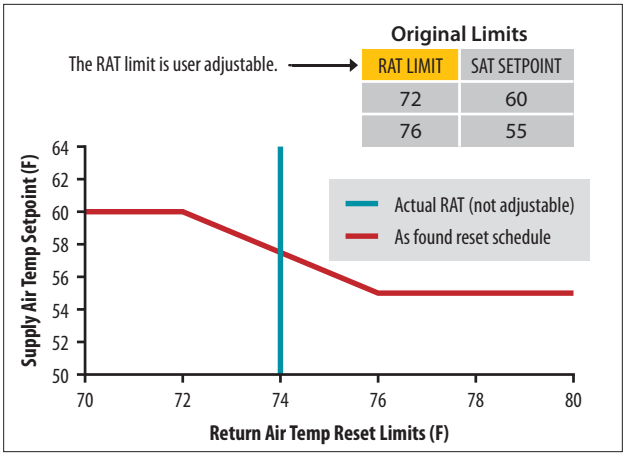

Figure 1: As-found condition

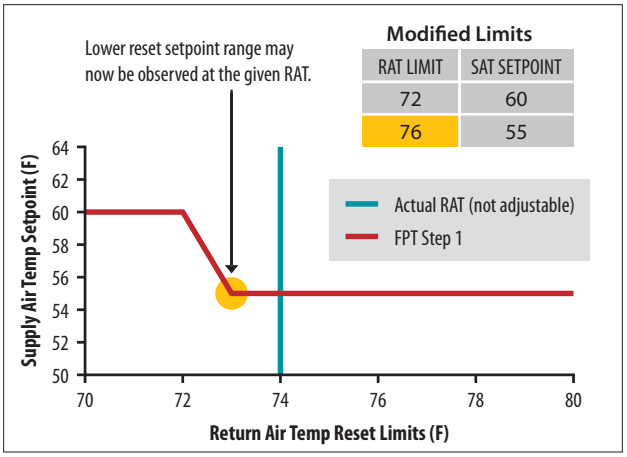

Figure 2: Modified conditions during the FPT

2011 Election Results

You cast your ballot, and the votes have been counted. Meet your International and Regional Chapter Board members, who will take the reins beginning January 2011:

INTERNATIONAL DIRECTORS-AT-LARGE:

Denis Bisson
SNC-Lavalin Operation and Maintenance

Laurie Catey
L.L. Catey Engineering Services, LLC

Adam Muggleton
CDML

REGIONAL REPRESENTATIVE — MID-ATLANTIC REGION:

Tony DiLeonardo
Wick Fisher White

REGIONAL REPRESENTATIVE — NORTHWEST REGION:

Bruce Pitts
Wood Harbinger, Inc.

CHAPTERS

NATIONAL CAPITAL

Jim I. Givens
RMF Engineering, Inc.

Ray Smith, CCP
GHT Limited

Wayne T. Williams
Architect of the Capitol

NORTHEAST

Mike Eardley, CCP
Cannon Design

Oneil D. Gayle
Joseph R. Loring & Associates, Inc.

Saverio Grosso
ENERACTIVE Solutions

John F. Penney
John F. Penney Consulting Services, P.C.

David Vallerie
Strategic Building Solutions

CENTRAL CHAPTER

David L. Lewis
Clayco

John D. Villani
Grumman/Butkus Associates

Lawrence E. Wessel
PEDCO E&A Services

Thomas Cappellin
HDR

NORTHWEST

Byron Holmstead
Engineering Economics, Inc.

Scott Nelson
Summit Building Engineering

Bryan Welsh, CCP
Welsh Commissioning Group, Inc.

Ed Simpson
TESTCOMM, LLC

Craig Hawkins
McKinstry

SOUTHEAST

Jim Magee
Facility Commissioning Group

Abdul Momen
Georgia State University

Mike Sabo
Energy Ace

Gary Sweatt
Building Diagnostics and Property Science

John Whitfield
Primary Integration Solutions, LLC

SOUTHWEST

Robert Gaynor
EnerNOC

Tia L. Hansen
Newcomb Anderson McCormick

Jim Hood
Eaton EMC Engineers, Inc.

Member Spotlight

with Herb Hunter

Home city & state:
Whitby, Ontario, Canada

Employer, position:
Hunter Facilities Management, President

BCA Member Since: 2006

Years in the building commissioning industry: 31

Volunteer Positions Held with BCA:
First president of Eastern Canada Chapter

Major BCA Accomplishments:
Founding member of BCA Eastern Canada Chapter, which celebrated its first anniversary on Oct. 18.

Is commissioning different in Eastern Canada compared to other areas? Other than the climatic challenges, it's the same as everywhere else.

What are some highlights from your position as president of the Eastern Canada Chapter during its first year? Bringing together the majority of commissioning providers under one umbrella to establish a common framework under which we will conduct our business was a big accomplishment. We also established ground rules and the various BCA subcommittees. Another highlight is the work that our members are devoting and the tremendous support that our members have provided in assisting with the development of the CSA (Canadian Standards Association) Z-320 Commissioning Standard for Buildings in Canada. I also want to mention the development of a "made in Canada" building commissioning RFP, which combines the LEED requirements and traditional building commissioning requirements.

For those not familiar with it, can you elaborate on the Z-320 standard? It's the first edition of a national standard on building commissioning that the CSA is developing. It's being developed in two phases, with phase one being the development of the standard and phase two being the development of an electronic interactive standard. It's anticipated that these standards will be published by March 2011.

CSA is a not-for-profit membership-based association serving government, industry, and consumers in Canada and North America. It maintains more than 2,500 consensus standards, many of which are referenced in Canadian legislation as well as voluntary programs, thus forming an essential link in protecting the health and safety of Canadians, quality of life, environment, and facilitating trade.

What is CSA trying to accomplish with the Z-320 standard? The intent for this standard is to provide guidelines for the commissioning of a building and all related building systems. It has been developed to deal with the building and its major systems as a whole in lieu of separate individual standalone components. It applies to new construction and renovations of existing buildings or facilities. The Technical Committee is developing this standard with the objective to provide a comprehensive, integrated, consistent and managed process for achieving and documenting the performance of a complete building and its major systems to meet the basis of design and operational requirements of the owner.

Major building systems included are:

- Architectural (building envelope, fenestration and interior space systems)
- Vertical and horizontal transportation
- Electrical (incoming, main and branch distribution, and life safety systems)
- Mechanical (HVAC, plumbing, life safety systems and refrigeration)
- Control systems and integration (BAS, energy management control systems, lighting control systems)

Who are the intended users of the standard? They may include workers and professionals who perform technical functions associated with any of the phases of the building operation as well as stakeholders who have an interest in building safety or related quality assurance (developers, general contractors, property marketers, regulators and consumers). The

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CX SOAPBOX

Company Certifications Needed in Commissioning Industry

ANOTHER PERSPECTIVE ON THE PE LICENSING DEBATE

By Frank A. Mauro

The Cx Soapbox in the previous issue of The Checklist had an interesting debate about professional engineering licensing of commissioning professionals versus the value of experienced commissioning authorities who do not necessarily have a PE license. The information gathered from both sides of the debate indicated that each was concerned about the future of the commissioning discipline from the standpoint of protecting commissioning and its value. Each side wanted to maintain the integrity of what commissioning provides, without falling into litigation and lesser value competition. I would like to add another perspective to the discussion.

I submit that the industry should begin to certify companies. The industry should cooperate with the commissioning leaders, such as ASHRAE and USGBC, to identify what they might expect from a good commissioning company. Organizations such as the BCA can set up the certification process and review and certify companies, based on their use of the required process—at a cost to the companies.

This is my opinion, and as far as I know, it is not endorsed by the BCA or any other professional organization.

"Experience is not merely the best teacher, but the only possible teacher. Theory should supplement the practice, not precede it." These very practical words came from Charles Kettering, an early 20th century industry leader who figured prominently in the development of Kettering University, formerly General Motors Institute, which stresses the importance of "book knowledge" (education) and experience combined. How do we maintain professionalism through the PE license or certification without dismissing the value of experienced commissioning authorities?

In the 1980s, the Automatic Temperature Control (ATC) companies changed the construction industry with the introduction of the Direct Digital Control (DDC) system. This electronic marvel of automatic temperature controls was supposed to be the answer to the problems of environmental systems that didn't work. However, too many unqualified opportunists took up the challenge of installing ATC systems—with the subsequent problems associated with DDC systems that didn't work. It could be argued that building commissioning came about partly as an outcome of this misdirected enthusiasm, and subsequent loss of value to an owner.

The commissioning discipline requires direction and protection from this same sort of failure. The value of experience contained in the original commissioning companies must continue. We must protect commissioning agents, commissioning companies and the commissioning process from the loss of respect and confidence that comes from an increase of unqualified, inexperienced commissioning authorities. How to do this? Do we require individuals to have PE licenses—with the possibility of no practical experience in the actual commissioning process? Or do we accept the possibility that experience may be our goal, but with the open-ended possibility that design and theory may not be a part of the commissioning agent's background.

ASHRAE has developed a commissioning process that is becoming the standard of the industry. ASHRAE has also developed a certification standard for commissioning. There are many other commissioning certifications in the industry. The BCA certification is arguably the most difficult to obtain because of its requirements for knowledge and experience as part of the applicant's resume.

However, this standard, as are the certifications of other commissioning organizations, is for individuals. As such, the certification can move from company to company with individuals. As important as the experienced individual is to the commissioning process, it is equally important for the owner to have confidence in the qualification of the company.

RFPs for commissioning now include plumbing, HVAC, electrical power and technology, IT, and even pressure test-

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Achieving Project Success through CxA Selection

By Patrick A. Prendergast and John D. Riley

Commissioning consists of two components; process and personnel. This article focuses on options for selecting commissioning providers, and the potential affect of those options on overall project success.

A critical factor of any commissioning approach is determining who is best suited to lead commissioning and execute testing. What qualifications must the CxA possess to effectively meet project goals? Also, how do you determine who does what?

Any of the following entities can perform commissioning tasks: third-party CxAs, construction managers, contractors (including equipment suppliers), designers and owners. Whoever performs commissioning, the individual's expertise must be sufficient to ensure correct system performance. Commissioning team experience, integrity and communication skills are also critical to project success.

Determining required qualifications must be decided early in a project. All stakeholders should decide the level of depth and rigor, based on the necessary assurance, and then match this with CxA qualifications. Possible conflicts of interest should be considered when determining roles and responsibilities. Commissioned systems criticality is a primary factor in deciding who is best suited to perform commissioning tasks.

STICK WITH YOUR STRENGTHS

Contractors are very good at constructing systems. Designers are very good at producing construction documents indicating required systems and how they fit together. Third-party CxAs are very good at determining appropriate testing procedures and verifying the facility fulfills the owner's project requirements (OPR). Not all facilities are created equal, and for critical facilities, the stakeholders are best served when entities perform the work that's best suited to their strengths.

Third-party CxAs provide an independent point of view based on knowledge gained during the design and construction phases and prior system operating experience, giving them the unique commissioning skills that critical facilities demand. The perceived disadvantage of the independent CxA is cost, but as is explained later, this perception is not necessarily accurate.

EXPERIENCE

Commissioning goals must be specific and documented to ensure tests are written and executed by qualified personnel to verify systems meet the OPR. A professional engineer with 20 years of experience is not required to take a pitot tube duct traverse on a restroom exhaust fan. However, that level of expertise is required to verify all the required operating scenarios are included in the control sequences for a data center chiller plant.

The commissioning staff should be diverse, with system specialists, system engineers and technicians assigned appropriate tasks to maximize effectiveness and cost-efficiency, with the CxA managing the overall commissioning process. Again, keeping with the various parties' strengths, for critical facilities, most of these personnel should be affiliated with a third-party CxA.

A DISCIPLINE-SPECIFIC APPROACH

Increased system complexity and interactivity virtually precludes a single person, or even a group within the same engineering discipline, from possessing the necessary expertise to commission all systems. A discipline-specific approach is superior. The jack-of-all-trade-master-of-none approach is not well suited for critical facility commissioning.

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"Functional Testing in EBCx" continued from p. 7

CONCLUSION

The use of functional testing in new and existing building commissioning helps ensure that a building's various systems and assemblies are functioning as intended. Proper advanced planning, which addresses such questions as the purpose of the test and how it will be conducted, helps to ensure high quality efficient tests. Good documentation ensures that planned procedures are carried out, and that a lasting record of the test exists for both the client and any utility rebate programs that may be used. ■

Erik Greensfelder is an engineer with PECI where he provides technical support related to industry research and streamlined energy savings from retrocommissioning measures.

Mark Effinger is an engineer with PECI, where he provides technical support for retrocommissioning programs. Before PECI, Mark gained experience with continuous commissioning through employment with the Energy Systems Laboratory at Texas A&M.

"Cx Soapbox: Company Certifications Needed in Commissioning Industry" continued from p. 10

ing and thermography of building envelopes. Because commissioning is no longer just the functional testing of HVAC systems, a company certification could provide standard levels at which a company could compete as a commissioning agent. There should be no reason to eliminate a small commissioning company from providing commissioning services because it does not have all areas of commissioning contained in it. However, no company large or small should be allowed to complete a part of the commissioning discipline in which it is not experienced or competent.

For example, peer review of design should be completed by a PE experienced in design. Commissioning of the electrical power equipment should be done by someone experienced with this equipment. Small companies could partner with a company that has that experience and license. The commissioning company could compete without a PE on staff, but would use a PE to complete the appropriate work of a total commissioning scope. Similar partnerships could work for other disciplines. And as important is the documentation and process of testing the equipment. Common templates for the functional testing would assure an owner that the commissioning authority has a full testing document for the equipment—not just a one-page, inadequate testing procedure.

Why would a company want to be certified, and why would its owners pay for certification? Fifteen years ago, the industry asked that same question of the USGBC. The present leadership position of the USGBC and LEED in today's atmosphere can answer that question. The commissioning industry should use the same model followed by the USGBC. Start with a preliminary process and company certification and then continue to expand the requirements, as this certification process proves to the industry its value. We shouldn't try to swallow the entire elephant at once. Take it on one bite at a time. Provide the process requirements for this first step, and then convince large organizations—such as ASHRAE, USGBC and the U.S. government—that such a certification can benefit and solidify the professionalism of our commissioning industry. From there, we can continue with the process.

There are many steps and unanswered question left to this process. This effort is not a six-month or even a one-year effort. However, the commissioning leaders should set a goal and begin the process. Let the commissioning industry pull together to define its value by defining requirements for a valuable, experienced, professional commissioning authority. Let the commissioning experts do this before litigation and government agencies put requirements on our industry that may not add value, but may simply complicate the advancement of commissioning.

I believe the BCA can provide this leadership. ■

Frank A. Mauro, PE, CCP, LEED AP BD+C, is a senior commissioning project manager for Heapy Engineering in Dayton, Ohio.

"Achieving Project Success through CxA Selection" continued from p. 11

TOTAL COST OF COMMISSIONING

All team members contribute to the commissioning process, which contributes to cost, the bulk of which can be roughly divided into two parts: CxA and contractors. The commissioning approach determines how total cost is divided between these two.

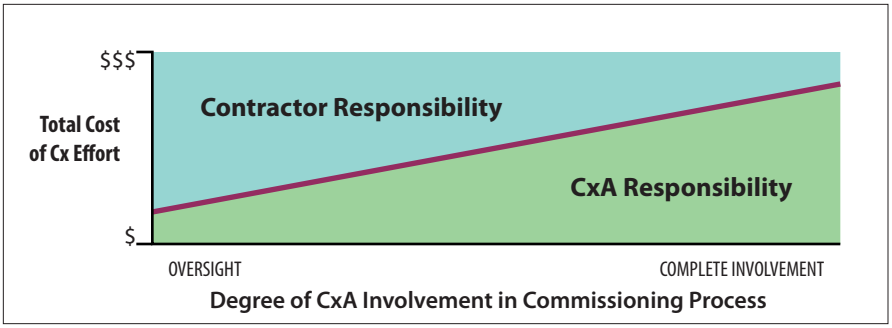

Figure A: CxA involvement and division of total costs

Figure A shows that the contractor's portion of total cost varies inversely with CxA involvement. The commissioning approach determines total cost and dictates a project's location on line A-B. The commissioning approach, and therefore cost, is greatly affected by decisions made regarding three basic cost factors: systems commissioned; system complexity; and system and component quantity.

STAFFING APPROACH AND COST

The commissioning approach directly impacts the total hours required to perform tasks and the cost per hour of staff to perform tasks. A high level of assurance demands rigorous testing, and the individuals' skills performing that testing need to be commensurate. There really is no magic to determining labor costs of commissioning:

(# hours) × (cost per hour) = commissioning labor cost

Commissioning process depth and rigor affects the number of hours required and also dictates qualifications of the individuals involved. In general, there is a direct correlation between individuals' experience and expertise and their labor rates.

SELECTING A CXA

CxA selection generally falls into one of two categories: qualification-based selection and price-based selection.

Qualification-based selection is strongly recommended for meeting commissioning goals for critical facilities. Regardless of the method selected, the commissioning RFP should include qualification requirements, and personnel actually performing commissioning tasks should be evaluated against their qualifications for systems installed in an individual facility.

Price-based RFPs require significant detail regarding the three basic cost factors discussed earlier, and significant commissioning approach detail is required. Generally, this information is unknown, as the design, at the time of commissioning agent selection, lacks sufficient detail. In this case, the owner should select based upon qualifications and rely on the commissioning agent's experience and expertise to assist in determining approach. Careful bid evaluation is necessary, because it is very difficult to get "apples to apples" pricing comparisons when bidding professional services, and this process may result in reduced initial cost, but most often does not end up satisfying the commissioning goals for a critical facility.

In summary, it is recommended that a team select a commissioning agent based on qualifications, and then together determine the commissioning approach for the facility. Once the approach and scope are agreed upon, negotiate a price based upon the commissioning approach. ■

Patrick A. Prendergast serves as the multi-disciplined project manager and CxA for many of the commissioning projects at GBA/ViroCon. As a CxA he has more than 13 years of experience providing formal commissioning services on laboratories, zero down-time facilities, healthcare facilities and large governmental facilities.

John Riley is the lead electrical engineer for GBA's commissioning projects. John has been providing electrical systems start-up and commissioning services for over 15 years. Projects include laboratories, data centers, central utility plants, healthcare facilities and utility power generating plants..

"Member Spotlight: Herb Hunter"
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standard may also facilitate certification to green building rating systems.

Can you elaborate on the "made in Canada" RFP? Why did that come about? The reason for the development of this RFP was the belief by our members that there was a need in the marketplace to establish an even playing field for commissioning providers along with the need to ensure that clients fully understand the complete commissioning process during the bid process.

Besides standardization, what other challenges do providers face in Eastern Canada? All our commissioning providers are facing similar issues with staffing and recruitment that the commissioning industry faces globally—basically the shortage of skilled, technical personnel with design, construction and operational backgrounds. With the upcoming release of the CSA standard along with its standards forms, we will have common standards to which all commissioning providers will be working towards, and then our natural progression will be the development of training standards and certification.

Last year, there were no BCA chapters in Canada, and now there are two. What's driving this activity? The main things are the greening of buildings driven significantly by LEED for new and existing buildings, utility costs, and the major push by the large property management firms to reduce greenhouse gases and overall costs.

What are the Eastern Canada chapter's goals for 2011? Our first conference is currently being scheduled for the spring of 2011. We're also doing a major membership recruitment drive and a marketing program aimed at the architects, engineers, construction teams and building owners.

A new Western Canada chapter is in its provisional phase. What are your thoughts about which chapter should include Manitoba? Manitoba has been with the eastern chapter and has participated with our group since its inception, and because of the size of the Canadian population that we currently cover, somewhere between 20 to 25 million people, this would probably be the best fit.

Anything else to add? It has been great to see competing firms come together in such a short period of time and create programs that will be beneficial to all of us. The time commitment that everyone has contributed to our growth has been outstanding and every one of them should be applauded. ■