

The Checklist

A Quarterly Newsletter of the Building Commissioning Association



YEAR ANNIVERSARY

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Letter from the President

Dear Members,

At last we are headed into the fresh colors and busy days of Spring – and to the BCA's 15th Anniversary in May. So much work from the founders, and then so much growth and participation of members and chapters over the last decade and a half! The result is organizational strength across North America, global participation, and a healthy position in front of building industry changes that accelerate the importance of our profession. Read more in the following pages.

The BCA was active in spite of the storm systems during the first quarter. In January we joined ASHRAE at their DC offices with other industry stakeholders to discuss the role commissioning has in building performance. This will be an ongoing discussion this year.

The New Jersey Institute of Technology hosted an interactive panel session in January that featured BCA commissioning experts. The "Rookie Boot Camp" was associated with the release of a Beta Test version of the Commissioning Authority distance learning training course developed by PECL, BCA and the Center for Building Knowledge at NJIT. The session video is being edited and will soon be available on BCA's website.

February's annual Leadership Conference in Austin, Texas brought over 70 BCA leaders from the U.S. and Canada together for several days to review the association's strategic plan and develop the action agenda for 2013. The International Board of Directors met on Day One to elect 2013 Board Officers, evaluate organizational policies, and update the BCA's 2010 Strategic Plan. After becoming a totally self-managed association in 2012, it was important to revisit BCA objectives, activities and responsibilities to ensure that we are healthy and growing on our own in these strategic areas:

- **EDUCATION.** Board members discussed education, best practices, certification and BCA development. Topics included ways to conduct, influence and endorse commissioning education in 2013 and beyond.
- **BEST PRACTICES.** New codes and standards that affect commissioning practices have been issued recently, with others in progress and targeted for publication this year. It was agreed that the BCA should evaluate and provide a unified response to them, comparing each to our own Best Practices.



- **CERTIFICATION.** The International Code Council's subsidiary (the International Accreditation Service), will soon be issuing "AC476 – Accreditation Criteria for Organizations Providing Training and/or Certification of Commissioning Providers," a guideline that will have global impact on commissioning certification requirements for the Commissioning Authority and Commissioning Specialists in subspecialties. Because of the BCA's deep involvement in developing both documents, we will take this opportunity to lead the industry toward meeting the goals of our 2012 industry white paper, "BCA Commissioning Authority Qualification and Certification Statement."
- **ASSOCIATION DEVELOPMENT.** From administrative updates, website changes and social media presence to attracting and retaining high quality membership, discussion of BCA's Association development path occupied a lot of time at the meeting. Like the Strategic Plan, the BCA's most recent Marketing Plan was created in 2010. Marketing and communications strategies were developed at the meeting and a Marketing Action Plan (MAP) is underway.

The Leadership Conference included an intensive all-day workshop focused on revising BCA's identity as an internally managed, self-sustaining trade association, and its relationship to commissioning industry sectors. Read the article on page 10 to know more about the results.

NCBC 2013, our 21st Annual National Conference, will be hosted by the Southwest BCA Chapter in Denver, Colorado, featuring such topics as commissioning for mission critical facilities, emerging codes and standards that affect our practice, monitoring-based commissioning, fire and life safety commissioning, and much more.

This year at NCBC we start a new tradition with the first annual BCA Education and Scholarship Golf Tournament. Later, the BCA Annual Meeting and dinner features a "wild west" theme and registration is open to everyone. For even more fun, we've arranged good seats at the Colorado Rockies vs. NY Yankees game on May 8th, tickets available on a first-come, first-served basis. Be sure to check it all out on the NCBC website at www.bcxa.org/ncbc and register early – I hope to see you there!

Sincerely,

Mark Miller, PE, CCP
BCA President

A SALUTE TO 15 YEARS OF MEMBERSHIP!

By Liz Fischer, Executive Director

In May of 1998 The Building Commissioning Association was formed – only back then it was known as the Northwest Building Commissioning Association. As you can see by the article *BCA's "Magnificent Seven" – 15 Years and Counting!* on page 6, this group of building commissioning providers from the Pacific Northwest worked tirelessly to bring this Association to life. To date five of the original seven founding members are still active in the industry. Pete Keithly has retired but is still available to offer his advice and comments when asked. Below is a list of those members who filled out their paper application in 1998 and have faithfully paid their dues every year for the last 15 years! **Thank you!**

- Dennis Anderson, CCP
- Kent Barber, PE
- Rick Casault PE, CCP
- David Coles
- Gretchen Coleman, PE, CCP
- Gerald Ensminger, CCP
- Craig Hawkins
- Joe Helm, PE
- John Jennings
- Karl Stum, PE
- Kenneth E. Toombs, CCP



Formation of the Association could not have taken place without other key players in the region including Northwest Energy Efficiency Alliance and its members, PECl, many west coast utilities, and state and local government agencies. Much of the initial core funding was generously provided by NEEA. In our next edition of The Checklist we highlight all the companies that supported the BCA through its early years.

BCA NORTHEAST CHAPTER Awards 4 Scholarships

The BCA's Northeast Chapter continues to promote education and the next generation of commissioning workforce by sponsoring a scholarship for students and professionals. Scholarships are intended to support either students' college tuition, or professional development courses for those employed in the industry.

The competition is administered by a Scholarship Committee led by BCA Northeast Chapter members Mike Eardley, John Penny, Ray Johnson and Steve Driver. Consideration is based on complete application submissions that include a written essay showing a strong interest and knowledge of the commissioning industry, and (for students) a transcript of grades. Reference letters are required and are especially valuable if they are written by personal connections to the industry.

Scholarship applications were considered from candidates outside of the Northeast region, as students from elsewhere may enter the workforce in the Northeast. Indeed, the Chapter received applications from across the US and Canada.

Winners awarded in March 2013 are:

- **Brian Nevole - \$1,000**
University of Nebraska - Omaha Campus
- **Chris Coakley - \$500**
Penn State University
- **David Gagne - \$500**
Maine Maritime Academy
- **Wesley Shuen - \$500**
University of British Columbia

Stay tuned for the next round of scholarships coming up this fall!

GO TEAM BCA: Volunteer Opportunities Available

By Sheri Adams

Volunteering in our committees is a great way to stay connected to not only the Association but the events in the industry. The BCA has many great opportunities to help improve our industry and our Association. Below are some opportunities available to current BCA members.

M&O Committee Volunteer Request from Committee Chair Darren Draper:

The BCA is looking for members to serve on the Marketing and Outreach Committee. Key objectives of the M&O Committee include promoting the BCA's activities and developments such as the Best Practices, NCBC, and webinar series. The committee is also dedicated to connecting the BCA to other organizations in our industry through outreach and liaison participation.

The M&O Committee currently has the following needs from volunteer members:

1. Crafting of the BCA Story, branding and "elevator speech" for use by members when promoting the BCA to non-members
2. Participate in the tailoring of a social media plan
3. Assist with planning for promotion of BCA training activities such as webinars and regional BCA conference events
4. Conduct marketing research to assess our competitive position in the industry
5. Assist with the development and execution of topical surveys that are relevant to the industry and for the advancement of the BCA

We anticipate that members will commit between 2 and 3 hours per month taking part in these exciting activities that will strengthen the BCA's position as a thought leader in the industry and adding value to BCA members nationally and internationally. We hope to have at least one (1) member from each region. We expect that much of this work will be accomplished in 2013 with on-going maintenance needed in 2014. All interested members should contact Sheri Adams.

New Committee Start-Up:

The BCA is looking for members to serve on the newly formed Member Services Committee. The International Board of Directors has directed this committee to evaluate member benefits, membership categories, and pricing. We anticipate that members will be asked to commit 2-4 hours a month in meetings and research. We expect that a majority of this work will be accomplished by November of 2013, with ongoing maintenance needed in 2014. All interest members should contact Sheri Adams.

Best Practices Committee Request from Committee Chair Karl Stum:

This committee is looking for volunteers to help review and update the New Construction Best Practices and create an online reference guide. It is the intent of the committee to make this document available in an electronic format with new and improved hyperlinks to improved examples and more detailed how-to materials. We anticipate that members will be asked to commit 2-4 hours a month in meetings and research. We expect that a majority of this work will be accomplished by January of 2014. Members of this committee should be well experienced in all aspects of commissioning and technical writing. All interested members should contact Sheri Adams.



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BCA'S "MAGNIFICENT SEVEN" 15 YEARS AND COUNTING!

Fifteen years ago, six men and one woman, mostly competitors, joined together to establish an association for the advancement of a fledgling building quality practice called commissioning. The Building Commissioning Association, then just a concept, was born – not without friendly debate, and eventually not without funding support from PECL and the Northwest Energy Efficiency Alliance. Some of the BCA's "Magnificent Seven," those who answered the call as Craig Hawkins put it, contribute fond memories of those early days. We tried and were, unfortunately, unable to reach Bruce Jones, but we salute his deep involvement as one of the Seven in bringing the BCA to life. Here are the others:

RICK CASAULT

Perhaps the most remarkable aspect of the birth of the BCA was the coordinated effort among six, and later seven, competitors, mostly small business owners, who recognized their common interests and worked as a team to create the BCA. They devoted countless hours to craft an organization to raise the bar in the performance of the commissioning process.

None of this group had ever created a professional organization - but we all knew about blazing new trails in our commissioning work. So this fearless band of competitors set off on their mission. Fortunately, we soon recruited the assistance of Stan Price to facilitate our efforts. Without Stan's gentle guidance we might still have biweekly phone conferences trying to figure out how to move forward with our ambitious goals.

Occasionally, we met in person, but more often two groups met in person and linked up on a conference call to agonize over the merits of a particular concept, such as peer review, or the best expression of our thoughts. Conference calls included two or three people huddled around a conference phone in Portland and four more at one of several venues in Seattle - Pete's office, Craig's construction trailer in the woods of Auburn, or at Rick's dining (aka conference) room table.

As a group, engineers and technical people are not generally lauded for their social panache. This core group, which became the original Board of Directors, proved the exception. They embraced the concept that a rising tide lifts all boats, bloomed with creative ideas, and devoted themselves to getting it right. Minutes of the first Board of Directors meeting, convened by teleconference at 7:00 AM, on May 29, 1998, include a discussion of meeting protocol. Board members agreed unanimously with Rick's proposal; "Board of Directors discussions shall be made by consensus whenever possible. Failing consensus, Robert's Rules of Order shall govern."

To the great credit of the first Board, we achieved consensus for all decisions, i.e. unanimous agreement. That meant that six competitors worked together until they could all agree. I was honored to be a member of this group, awed at the task we had undertaken, and proud of the results. These individuals continue as my competitors, and more importantly, as life-long friends. Thank you for your selfless dedication and hard work.

KENT BARBER

My most vivid memory of the BCA's origination is what a dedicated and sincere group of people were involved; first 6, then 7, commissioning professionals who chose to work together as colleagues for the advancement of our profession, and ignore the fact that we were also competitors. We worked a tremendous number of hours together documenting the Essential Attributes, getting the organization off the ground, and obtaining the support of other service providers. We'd get frustrated with each other at times but for the most part the commonality of our motives and goals, grounded in our belief in the importance of building commissioning, was striking. It motivated me, and I think the others, to really put a piece of myself into what we were doing. For me it was one of those standout life experiences. I look at the hard work and dedication of those who came afterwards and it blows me away to realize that the ethic persists. Some of the subsequent

and current BCA members and leaders appear to be even more dedicated and work even harder for the organization. The difference the BCA is making in the “buildings industry” today is remarkable. I think when members fully comprehend this there’s no question about the value of supporting the BCA.

GRETCHEN COLEMAN

I remember the early days of the NCBC, when Nancy Benner was the biggest advocate the fledgling Building Systems Commissioning industry had. She had heard that I was doing a lot of commissioning and asked me to present at the conference. Terrified of speaking in front of groups, I claimed to be too busy to get a paper together, which was the truth but also an excuse. I was incredibly remorseful when she passed away before I agreed to do a presentation. So, when Kent Barber, someone I cut my teeth in the industry with, asked me to be part of a group that was starting a professional association, I said yes – this would further Nancy’s dream. The first meeting I attended was in a construction trailer, in the woods behind Craig Hawkin’s house (I was enamored and totally wanted my own construction trailer to use as an office some day). In that “conference room” sat (or was on the phone) the competition (Craig, Kent, Rick, Pete, Karl and Bruce) and I was thinking, wow, we are NEVER going to agree on anything. But, they surprised me. The power of open-mindedness, collaboration, and a true passion for the industry brought a diverse group of competitors, owners, utilities and nonprofits together and an association was born. They say time colors all memories... but I truly remember the excitement of bringing an organization into fruition; working with my peers to make it happen. And look at the organization today: from regional, to national, to international. How has it changed? The ideals on which the organization was founded are still there. What has changed are the people. The diversity of the group is amazing – diversity in location and vocation. This is what makes an organization viable – the participation of the members.

CRAIG HAWKINS

When thinking back to the time we were meeting to form what became known as the Northwest Building Commissioning Association, I have several fond

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memories that I like to share with people to give them an idea of what it was like back then. Some of those memories are impressions that I recall rather than actual incidents. For instance, I remember thinking at the time that we were six competitors all fighting for a small piece of a new industry, and here we were all pulling together to create an association out of nothing more than the desire to establish a benchmark of quality for our new industry. You have to realize that at the time we were meeting to create the Essential Attributes and the original Bylaws, we all were practically grabbing people off the street to tell them about this “new thing called Commissioning” and how wonderful it would be for their projects. Back then very few people had ever heard of Commissioning. Far different than today when Commissioning is commonplace and even part of building codes. The other impression I recall was that after several months of discussing, haggling and

15 YEARS **AND COUNTING!** (cont.)

rewriting the exact wording of the Attributes, it dawned on me that we had unanimously agreed on every vote. There was never a time where we had a dissenting vote from anyone – everything we agreed to and voted on was done with a unanimous vote. That to me is pretty amazing!

As for a memory of an actual event, that one is easy. It all started when Kent Barber introduced his initial list of Essential Attributes of Quality Commissioning. Once we had his list, the seven of us started to go through each one to agree on the validity, importance, relevance and most critically the exact wording that would best express the standards we had set out to create. My fondest memory happened during one of these sessions when we were discussing the wording of one of the Attributes. We found ourselves stuck on one word, which I recall was “that.” I believe we argued over the inclusion or exclusion of “that” for at least two if not three sessions! We would argue, then set it aside and move on to another, then come back to it and argue some more. Eventually, we came to an agreement and I cannot for the life of me remember if we kept it in or took it out, in the end it didn’t matter but what was so memorable to me was the effort we went through to “get it right.” Seeing how the Essential Attributes have stood the test of time, I’m proud of the effort we put into it to get it right!

PETE KEITHLY

My most vivid memories of our BCA founding process are of the many meetings we had (typically at one of our houses) to put together the Essential Attributes of Commissioning document that formed the basis for the BCA. Ours was one of those unique groups of individuals that just seemed to click as a team. We all had a sincere passion for developing and promoting the commissioning process as a means to significantly improve the functional performance of the building systems being designed and installed. I think one of the reasons we worked so well together is that we had different backgrounds and perspectives related to construction and facilities operation and therefore we were able to better understand why a successful commissioning process must be a team effort of the designers, owners, project managers, contractors and facilities operation professionals. I really enjoyed my experience working with the BCA founders and feel as though our “creation” represents a significant contribution towards improving the building industry.

KARL STUM

Three things stick out the most in my mind, as I reflect on those days: (1) the association with a group of people who were truly experts in their field and totally dedicated to the cause of creating an organization that could forward the needed profession of building commissioning; (2) the deep level of engagement with detail and perfection that each in the group had, making sure the organization and commissioning attributes and guidelines were totally applicable and accurate—that each one in the group was “OCD” on this issue is an understatement! So, how does a group of experts, each a perfectionist with a strong opinion, come together on a set of core attributes and by-laws? Well, we were able to do it because we were respectful of each other and willing to compromise, but not until things were flushed out and rehashed to the nth degree--and we stuck with it until things were right. And that brings us to my (3) the thing that sticks out most in my mind is the relentless, never ending conference calls every week... after week... after week, for decades, I think ;).

Happy Birthday
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We are 15 YEARS OLD this year. Let’s celebrate and then get on with the next 15!



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THE INTERNATIONAL ACCREDITATION SERVICE (IAS), a subsidiary of the International Code Council (ICC), has released the Accreditation Criteria for Organizations Training and/or Certifying Individuals Involved in Commissioning for public review. Comments are due by May 15, 2013. The draft is available from www.iasonline.org/Accreditation_Criteria/1306-pre/MISC3-0613.pdf. On June 7, 2013, there will be a hearing of the IAS Board to hear the committee's report and further public comments. Details can be found at www.iasonline.org/Accreditation_Criteria/1306-pre/. We encourage all Commissioning Authorities to review this criteria and provide comment.

THE IAS TECHNICAL ADVISORY COMMITTEE has been working toward setting the standard for accreditation of companies that certify commissioning authorities. They took a broad look at global commissioning industry growth and worked to standardize definitions of competency for organizations that administer certification to individuals. To be clear, their objective is not to develop a commissioning code or standard, but to design a framework and protocols for associations that certify commissioning authorities.

What the BCA Leadership Meeting MEANS TO YOU

By Diana Bjornskov

BCA is the voice of commissioning in the building industry – the “commissioning only authority.” February’s annual BCA Leadership Conference brought 72 members to Austin, Texas, to review organizational strategic documents, and plan for the future. The 2½ day event included an International Board meeting, a strategic planning session, and an intensive all-day workshop focused on the BCA’s people, goals, position and relationship to building industry sectors. Here are some of the details.

What Sets the BCA Apart?

The workshop began by clarifying what sets the BCA apart from other trade associations. Here are the top three “differentiators,” both internally and across the international marketplace:

1. BCA is focused **exclusively** on commissioning
2. BCA invites and includes many disciplines, with one focus: commissioning
3. BCA is a whole building commissioning organization

BCA’s industry leadership is built upon that foundation, valuing teamwork and a whole building approach to achieve long-term building performance, mitigate project risk, and to provide the best return on investment for owners.

Of course, the purpose of the BCA is to carry out its mission. But what’s the blueprint for that, exactly?

Workshop members agreed that advancing commissioning through the activities listed below are critical to carrying out the BCA’s purpose:

1. Creating and providing education, training and documentation
2. Defining and executing best practices
3. Setting and raising the bar on qualifications and certification
4. Developing inter-organizational collaboration to advance commissioning
5. Pursuing and demonstrating consistent industry standards

The Workshop provided an opportunity for inter-regional teamwork to define and elaborate the value that the BCA and its members bring to the table every day, and how to expand our members’ potential in the market. As a result, a number of actionable ideas became agenda items for 2013-2014.

Time and again, Workshop members found themselves saying, “Yes, we do our jobs with pride, we are good at it, but we don’t talk about it. In fact, we don’t really know how to talk about it.” If you find yourself at a loss for words, here is a summary – or reminder – of “things you can say.”

So, “Who” is the BCA?

As the BCA is the voice of the commissioning industry, so you are its heart. It’s important to know how to talk about the organization you represent. Here are two alternatives:

The mouthful (do you really talk this way?): The BCA is made up of cutting edge, international, educated technical experts who are dedicated commissioning industry leaders. They share a philosophy of professional excellence and pride in best practices that ensures buildings are constructed well and operate efficiently, and as designed.

The elevator story (you do really talk this way): The BCA is made up of thousands of professionals throughout the building industry focused on one thing: making sure buildings work. Right.

Who are your clients, and what should they know?

It’s not always easy to verbalize the array of values that you bring to projects, whether they are new construction or existing building renovations, retrofits or remodels. Here are some things you already know, and you also can (and should) convey to listeners:

- **Building Owners.** You protect the owner’s interest in building design, construction and operation as an essential project team service.
- **Design Teams.** You provide outside quality control and effective feedback on systems integration and operation.
- **Contractors and Developers.** You help the



schedule stay on track, suggest useful project sequencing, and reduce risk of cost overruns.

- **Facility Managers and Operators.** You provide documentation and training for startup and continuous optimization.
- **Building Occupants.** You champion their safe, healthy and comfortable environment.
- **Other Commissioning Service Providers.** You bring in specialists to commission distinctive or unusual systems and building types.
- **Government Compliance Agencies.** You ensure code and performance compliance.
- **Electric, Gas and Water Utilities.** You provide the proof required for payment of construction and/or performance incentives. You guide utilities on commissioning program design and implementation.
- **Yourself.** You communicate a high standard of excellence. You shape the industry.
- **Future Commissioning Authorities.** You preach what you practice.

even more energy efficient systems are on the horizon.

- Renewables in commercial buildings require systems integration and energy efficiency calculation expertise.
- Energy modeling is required by more and more utilities providing incentives for construction and long-term building performance.
- Manufacturers and software designers are introducing a growing number of building controls and Cx software types and applications.
- Subsystem specialists are increasingly required as ASHRAE and USGBC standards expand Cx definition of scope to include building envelope, fire and life safety, 7x24 mission critical and other facility systems.
- Efficiency value organizations (EVOs) are increasingly brought in by owners for post-design value engineering which can affect proper systems design or integration.

What industry trends are you facing?

Your clients and team partners need to know what's happening in the building industry that is affecting – or will soon affect – large and small project scope, cost, skills and knowledge requirements. Here are some trends in progress that you can pass on:

- Industry is moving toward a more standardized Cx approach and process.
- Governments and major industry associations are writing and supporting increasingly stringent codes and standards (attend NCBC and see January Checklist for more).
- Performance monitoring is required for ongoing Cx (MBCx).
- Energy systems financing is available from special energy lending institutions for new construction and existing building retrofits.
- Energy costs are always rising, but steeper hikes and



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BCA Leadership Meeting (cont.)

How the BCA supports you and your business

Workshop attendees stressed the need to work toward increased innovation, integration of BCA members with their peers, and finding ways to support commissioning providers and their roles in the project team.

Some of the agenda items underway now and for the coming years include these, which are prioritized on the BCA's strategic calendar:

- Providing educational opportunities for all building professionals on changes in regulations, codes and standards that affect building performance
- Being a visible conduit to new commissioning technologies and procedures
- Leading the way toward alignment of international industry guidelines
- Creating a speakers bureau of experts for industry, chapter and inter-organizational education
- Leveraging partner organizations to extend industry outreach and best practices
- Activating peer recognition and achievement awards
- Enabling dialog among members through podcasts and social media, including technical discussions, practical advice and industry announcements
- Promoting stimulating, educational events and networking opportunities
- Providing scholarships to students and professionals
- Promoting international commissioning discourse, skills, knowledge and practices
- Recharging NCBC (National Conference on Building Commissioning), starting with its 21st year in May 2013!

The Leadership Conference was intense. The ideas were illuminating. The outcomes were many and challenging, and they are doable. The BCA Board, staff, Chapter leaders and BCA member volunteers are at work to bring you the best organizational program to support and strengthen your business ventures and the industry we love.



Mark Your Calendars

MAY 6-8, 2013 | DENVER, CO

Join us for the 21st National Conference on Building Commissioning!

BCA is excited to carry on the tradition that was started 21 years ago by PECE, and we are grateful to them as the originator of NCBC, for their continuing support and sponsorship. This year, the conference continues to grow its constituency, connecting the diverse players in this international market and elevating the knowledge, skills and applications that lead to high performance buildings.

For more details go to www.bcx.org/ncbc.



Construction Phase

Commissioning

By Diana Bjornskov



There was a time when Commissioning Authorities were met by adversarial construction teams or seen as a barrier to meeting the completion schedule. Commissioning was perceived as a costly but unavoidable add-on before the owner signed off on completion.

In today's building industry environment, increasing emphasis is placed on whole building commissioning. Scores of papers, articles, guidelines and standards are written about the integration of commissioning teams and process into planning, design, construction and operation. More often than not, general contractors now view commissioning as an ally in quality control, time savings, and performance measurement – all of which affect the owner's project cost and the contractor's profit margin.

Construction project-focused BCA members **Dave Conner** (Senior Manager, MEP and Cx Services, Holder

Construction Company- private sector projects), **Ed Faircloth** (retired Senior Project Manager, NASA Johnson Space Center building construction program), and **Joe Dillingham** (MEP Coordinator & Cx Services, DPR, Inc.) provide an inside look at the place where the rubber physically meets the road – commissioning during the construction phase. Their combined careers managing construction of large government buildings and private sector data centers, biotech facilities, hotels, airports, higher education and other building types adds up to a wealth of experience and insights for commissioning providers.

What makes construction Cx different from other phases?

Ed: Contractors are a whole different type of people. Construction people are focused on putting the job together – they have a different way of communicating. They don't care about the elements of design, they care about doing the best they can to build and install things as shown on the design documents. On a jobsite, the atmosphere is very focused on delivery, schedule and efficiency, and the federal government mandates specific communication protocols that may be more lenient in the private sector.

Sometimes contractors have come into the project with an "attitude" about commissioning. I've asked some contractors if they've gone through the commissioning process before and understand the benefits. The ones who haven't sometimes have to go through a learning curve to better understand the reasons for commissioning. For example, I had a contractor come up to me on a 7 story office building at NASA, and I got a lot of pushback from him. But, when he wasn't called back anytime in the following year and had no warranty issues, he had a lot better understanding of why commissioning is important.

It's important to be very diplomatic with contractors, and set up a good relationship from the beginning in order to help them get through the project as quickly and efficiently as possible. Normally on my projects, depending on what's being commissioned, the



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Construction Phase Commissioning (cont.)

Commissioning Authority would start the contractor relationship with a pre-Cx meeting, defining and coming to agreement on the roles and responsibilities of all the parties. During construction of large projects the CxA would come out once a month or so, especially after 50-60% completion. Toward the end we'd have meetings every 2 weeks, and then every week until the project is complete.

Dave: When the project is still on paper, change costs are relative in nature to the scope, but when changes occur onsite as a result of missing components or sequences, they become very expensive and time consuming. In one case the design may not be interpreted by the contractor the same way as the design engineer wanted. In another case, the design doesn't include the right information (say, for instance, it's copied from a previous job). I've experienced cases of misapplied systems that don't show up until systems testing begins. One example is where the emergency eyewash was installed with an instant hot water heater which burned out the elements. The documents should have specified a standard tank type water heater, allowing for storage capacity cycling heating, or gas water heater, or a reverse osmosis system set up for demand. If you can't test the system because it can't produce enough hot water, then you basically can't commission the whole building as it was intended to operate.

Joe: A General Contractor looks at all of the things a CxA would look at, but constructability and sequence are also factored into the evaluation. Major milestones are identified like equipment arrival and energization. Logistics also become an issue because there are often multiple subcontractors working in any given area at the same time. The general contractor must manage all of the work in the building and minimize schedule, logistical and communication conflicts.

When does the CxA usually get involved with construction?

Ed: The Commissioning Authority needs to be involved at least by the time of the pre-construction meeting, where all the construction players get together. Of course, the CxA should sit down with the design team

and owner to work out issues, and do the homework so that during the construction phase he/she conveys details to contractor.

Dave: While we all say the CxA should be involved at project conception, this rarely has occurred on most of our [data center] projects. We typically either hire a Commissioning Authority direct or help the owner bring a CxA onboard as soon as we are involved with a project. Because 70% of our projects are data centers, we typically have very talented owners, architects and engineers who are very familiar with MEP systems and designs. So, when our CxA's get involved during or just before we start construction it is typically has not been a problem. So, entry at the beginning of construction historically has worked for data centers due to the building type and stringent requirements, but now data centers are increasingly focused on energy efficiency because their loads are so high. Energy efficient systems for green data centers now means we need to get CxAs involved earlier due to systems like indirect evaporative cooling.

Joe: We all know the right answer but the CxA usually gets involved well after the project starts. Normally the Owner's Project Requirements (OPR) and Basis of Design (BOD) are complete and design documents are in progress before the CxA gets to the first meeting. The General Contractor does not hold the contract for commissioning but we do recommend commissioning services to the owner very early in the process.

How should a CxA prepare for working with general contractors?

Ed: Find out their experience and philosophy, their motivation for getting the job done. If it's money, you can work with that. The CxA needs to understand the nature and terms of the architect/owner and owner/contractor contracts. Contract penalties and incentive rewards should be known upfront, because the role of CxA is to ensure that both ends meet. It's important for the contractor to see that the CxA works quickly and efficiently.

Dave: Keep teamwork in mind! If you step into a project that is already underway, you can cause disruption in the flow and schedule. Schedule drives

the project. Look for opportunities to help the team make the construction schedule; creating a testing schedule that doesn't interfere with construction work will help the contractor maintain the flow. When building fast, for example, the project team could be completing a construction phase while the CxA is moving into electrical testing. Also, scheduling testing during evening to avoid impact to construction will help the contractor meet goals. Sequential testing when the contractor's team puts a chiller or generation

plant in place is helpful; you can do functional testing on one chiller as completed and pass that individual element's functional test, and then commission all the integrated systems as a whole building.

Joe: The best relationship between the GC and CxA is built on mutual respect. Adversarial relationships create more conflict in the process. When all parties have the best interest of the project in mind, more can be accomplished. Compromise is also a key skill set for both parties. The GC and CxA may have different terms and definition to accomplish the same goal but everyone should agree on how to approach the different phases of work.

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What are the main issues – and their solutions – CxAs face during construction?

Ed: In general, working with contractors who are not experienced with commissioning is a problem. The CxA needs to make sure the contractor understands the commissioning plan developed during design. You have to keep on top of timing and schedule, and work with the contractor to avoid unnecessary trips to the jobsite. It's most important to keep a good line of communication so you can work together to get a complete set of documents. The project team needs to have the CxA on board no later than 40-50% of design. Early on at NASA we sometimes brought in the CxA at start of construction, but now it's mandated by owners that CxA comes on board early.

Dave: Having to deal with incomplete or poorly tested work becomes a major issue. For example, building automation and power monitoring are typically the last to be completed, but the first to be tested. Controls and monitoring usually are the biggest problems. Also, when a general contractor compresses time in the schedule it doesn't allow for adequate checkouts. One solution is to bring the BAS provider onboard with a team approach contract. Factory witness testing of the controls offsite, (in warehouse, before bringing the equipment onsite) can help the schedule, with a review of system graphics before arriving for installation. Scheduling pretests with the engineers and the GC's MEP personnel is useful.

Construction Phase Commissioning (cont.)

Joe: If the CxA is not on site every day, it is difficult to stay informed on the changes to the schedule and project developments. The CxA may realize a problem, identify the issue and leave the site. The subcontractors start working on the problem immediately and may have a resolution in a short period of time. If the CxA is not local to that city, it can take time to get back to the site and re-test the system. Constant communication is the answer to many of the problems. Commissioning is much more than a science, it is an art. The ability to communicate issues and resolution is fundamental to a successful project. Meetings are helpful, but more importantly phone calls between the commissioning team and construction team are essential.

How do contractual relationships work?

Ed: In the public sector the contract is typically between the owner and the CxA who acts as the owner's representative; there is normally no contractual relationship between the CxA and the general contractor. There can be a contract between the architect and CxA, as long as they are separate offices.

Dave: In our work in the private sector we, as the general contractor, often actually hire the CxA's direct on many of our projects. In addition if the owner wants to hire direct, we will typically develop the RFP, hold interviews and recommend providers to/with the owners. Owners don't always know what they need from the CxA, so we write the detailed scopes for them.

Joe: In many regions, the general contractor and CxA work together more than that the CxA will defer to the general contractor, but that contract will be held between the Owner and general contractor. It is very unusual to have the CxA and general contractor engaged in a contract. Public sector work has more milestones and there are usually more processes to complete to prove successful completion of the work. Private sector work may be driven by different missions so the needs vary from project to project.

Words of wisdom for construction phase CxAs...

- When getting involved with construction phase commissioning, CxAs have to understand that there can be an adversarial attitude; the GC can resent them if they have the sense that the CxA is looking

over their shoulder at other people's work and accepting or rejecting it.

- The CxA must be able to build an honest, straightforward integrity relationship.
- The CxA must make it clear at the beginning that he or she is not here to delay but to get it done as well and efficiently as possible.
- Communication is a big key for the CxA who must be respectful but also firm to make sure the project achieves what owner is trying to get done.
- Don't act like a design engineer, and participate as a team player.
- Point out some of the holes and try to foster strong relationships with the current construction team.
- Be assertive, but not obstinate.
- Construction phase commissioning can be difficult for a young person new to the industry – you work long hours, you must enjoy what you're doing, and you must be a self starter.
- Remember: We're all working for the owner.
- Separate the different scopes. The CSA (Civil, Structural and Architectural) should remain isolated from the MEP (Mechanical, Electrical and Plumbing) scopes. The fire/life safety scope is normally included in the commissioning scope.
- The process can be very rewarding and the indication of a successful project is a commissioning process that requires few corrections to the equipment and systems in the building.
- The CxA shares the commissioning forms before the process starts and the general contractor should pre-test the systems prior to the CxA arriving on site to formally test the system. The CxA should not have to observe any issues during the formal process 'in a perfect world'.



Does Everybody Make The Best Barbecue?

By Liz Fischer, BCA Executive Director

In February, the BCA International Board of Directors, Chapter Boards, Committee Chairs, and the Building Commissioning Certification Board met for the annual Leadership Conference in Austin, Texas to plan the year and discuss industry and BCA issues. This meeting brought about one of the most heated discussions I've encountered in the BCA: Who makes the best barbecue? Since we were in Texas, you could assume the debate was about regional BBQ – Texas, Kansas, North Carolina – but no. It may be because so many Texans came this year that the discussion got "scorching" – like, is it better in Houston, Dallas, Austin, or some other Texas town? Now, I'm from Portland, Oregon. When I claimed I knew how to barbecue, everyone from Texas to North Carolina laughed and said that was impossible. I felt like I was from New York City! Imagine my jitters about taking these members to "great" barbecue in Austin. But, much to my surprise, even the North Carolinian acknowledged that Texas barbecue was indeed great! Why? Because we all agreed on one thing: no matter where it's made, or how it's smoked or rubbed or slathered, nothing beats good barbecue!

Our two and half days at the Leadership Conference went pretty much like that. We had different ideas about how to grow our Association and improve our industry. Sometimes it got a little heated. But at the end of the day we all had the same mission - to build a better industry and prove that the BCA can lead that charge. By working in groups we learned from each other, tested and challenged our ideas, and agreed on ways to expand current programs. Leadership within the groups varied but the message was always the same – working together we do make a difference.

Leadership shows up in many different ways throughout the BCA. Our members make things happen every day providing quality commissioning services, expanding knowledge and certifying themselves and their staff. Leadership also means that we all – each of us – live our mission, by ensuring that every owner gets the expected quality product from BCA members; by engaging in BCA Chapter and Committee activities; and by taking action in this industry leadership organization.



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The Experts in Total Building Commissioning

In the last Checklist I wrote about finding your unique strength and ability to engage more deeply in our Association's activities. Commissioning professionals all have leadership qualities that the BCA needs right now. Are you ready to use that strength, to be a leader by helping to build a better industry? Find out how to get more from the BCA by giving more. In the article, Go Team BCA: Volunteer Opportunities Available by Sheri Adams, you can choose from tasks and projects the committees are working on and help accomplish their (and your) goals. In other words, I think we can all agree on one thing: no matter where you live, or how you work and play, nothing beats a leading team and nothing beats a great BBQ!

BCA Member Craig Hawkins (Senior Commissioning Engineer, McKinstry) sat down with The Checklist to answer questions about an exciting new outreach program in development to educate and attract college students to commissioning as a challenging and rewarding career choice.

What is the “college road show”, and what is its purpose?

As with most programs, Student Outreach started as one idea to tackle a specific issue, that of reaching potential new members, but has now grown into a more complex, multi-level program with one general purpose, but with several potential outcomes. The over-riding purpose of the Student Outreach Program is to introduce the concept of commissioning to up and coming engineers as a potential career path. As one of our committee members is fond of saying “Commissioning is kind of like Denny’s Restaurants... no one sets out to go into commissioning, but we’ve all managed to get here. Just like no one sets out to go to Denny’s but at 3 in the morning, we all seem to find ourselves there.” The NW Board decided it’s time we change that; it’s time we take Commissioning to the potential engineers of tomorrow instead of waiting for them to find us 20 years from now.

Does the program have a name yet?

The BCA’s internal working title for the program, so far, has been “The Student Outreach Program”. That’s simple and captures the essence of the program’s focus; we will probably stick with that one. The title of the presentations to students is still in discussion.

How did you come up with (i.e., what was the precedent for) this idea?

During one of our monthly Chapter Board Meetings, we were discussing ideas on how to increase membership and we started to look at the various groups we had already in our Chapter to see where we may need to focus for future members. One of the first groups we identified was students, as we had

none in our Chapter. I had mentioned that a former Chapter leader had introduced me to his nephew who was an architectural student looking for a summer intern program and that sparked a discussion on reaching out to students and the idea took off from there.

When did you get started with the planning?

Planning started about a year ago, right after the 2012 BCA Leadership Retreat in Orlando, FL.

Who is involved, and what are their roles?

Every member of the 2012 NW Chapter Board has played a role one way or the other in developing this program, but the three major players have been Ed Simpson, Jeremy Wolff, and I. Ed and I have developed the backbone of the program, what will be presented and how the program is structured, Jeremy has created a great introduction letter that describes the programs goals and purpose. The letter, along with the outline of the presentation, will be sent to the various colleges and universities with engineering and architectural programs within our Chapters boundaries.

Describe the process you’ve gone through to develop the road show.

First thing was to develop an outline of what we wanted to present to the students, then we moved onto how it was to be presented (PowerPoint, lectures, tours, etc) and then once we had a basic concept, Ed and I sat down with two members’ professors from the University of Idaho and discussed with them our concept. Based upon their feedback, we moved forward with the detailed development phase.

What kinds of challenges/problems have you encountered so far?

Honestly, our biggest challenge so far has been ourselves! We are all busy with our own businesses, our families and helping to run a Chapter, so finding time to devote to developing a new program from the ground up has been a challenge. The other major



obstacle was our own pre-conceived notion of what to present and how to present it. We thought we knew what we wanted to present until we spoke to the professors that deal with the students on a daily basis, then we had to scrap our first ideas and basically start over.

We have come to realize that the biggest challenge we will have is understanding the world as they see it today, rather than trying to explain our industry to them. The world they are living in is mostly theoretical, where we are more practical. They are studying physics and physical laws of science, while we deal with problems in applications of equipment and systems they have never heard of. Developing a program that introduces them to an industry that is geared to identifying and documenting issues to equipment and systems that they have no experience with is very difficult. It's not like we can walk in there and say "Here, let's talk about how specs and drawings don't match and how the sequence is not written well...etc." We might as well be speaking Greek to them.

How are you solving them?

The discussions with the two professors from the University of Idaho helped us to refocus on the delivery methods. We had some preconceived ideas that were scrapped once we heard what the professors had to say about their students. I guess it's been way too long since we were in college for many of us, so we had forgotten what college students like, listen to and how they absorb new information.

What's the status of the project today?

We are still pulling together the details of the lectures so that once we send out the introduction letters and outlines to the various colleges and universities in our Chapter's geographic region, we will be prepared to answer questions and set up guest lecture dates.

When do you expect to "go live"?

Tough to say, but I think realistically we are shooting to do our first "Guest Lecture" early in the Fall 2013 quarter (September/October).

How will the program be implemented?

We are offering to be "Guest Lecturers with real world experience." Our initial thought is to present Commissioning in two sessions. The first will be an overview of engineering in the real world with broad brush strokes followed by a more detailed session where we will speak specifically about the process of Commissioning, its benefits and challenges.

What is the outcome you're hoping for?

Ideally, we'd like to see the engineering and architectural students apply for intern jobs in our industry so that we can start to grow and develop the CxA's of tomorrow, the future leaders of the BCA.



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